LS-DYNA Software Revision 11.2.2

Release Notes

Oasys

LS-DYNA ENVIRONMENT

Release Notes for R11.2.1

January 25, 2021

Contents

§1 Release notes revision

This file constitutes revision 0 of the release notes for LS-DYNA version R11.2.1.

§2 License

The string "REVISION 11" must appear in the LS-DYNA license file in order to run version R11.2.1. Please contact your LS-DYNA distributor or your Ansys sales representative if you have to have your license updated.

§3 Documentation

Documentation of R11.2.1 is provided in the R11.0 User's Manuals which may be downloaded from www.lstc.com/download/manuals. For features mentioned in these release notes but which appear to be missing from the R11.0 User's Manuals, please refer to the DRAFT User's Manuals at www.lstc.com/download/manuals. Please note that not all features in the DRAFT User's Manuals are available in version R11.2.1.

§4 Notes

The remainder of this file describes what's been added or fixed in version R11.2.1 since the release of version R11.2.0. See the release notes of R11.2.0 and R11.1.0 to see what was added or fixed in those releases since R11.0.0. The changes are primarily bug fixes.

The items are arranged by category. In many cases, a particular item could fall under more than one category. For the sake of brevity, each item is listed only once under a single category.

§5 Airbag cards

1. ***AIRBAG_PARTICLE**:

   - Fixed issue in calculating the total leakage energy caused by uninitialized variables for porous energy leakage from internal fabric parts. This issue gave random results.
   - Fixed issue associated with the initial air particle assignment for a multiple airbags model. The bug caused results to depend on the order of the airbags in the input.
   - Store maximum temperature for nonlinear C_p curve to keep the value monotonic for the energy calculation.
   - Fixed error in vent mass flow rate calculation after the switch from the corpuscular particle method airbag to the the uniform pressure airbag. This error occurs with or without a chamber definition (CHM on Card 6).
   - Fixed issue in reading XMi (Card 12) in the ***AIRBAG_PARTICLE** input that occurred when the ID associated with ***DEFINE_CPM_GAS_PROPERTIES** has 9 digits.
   - Added to the CPM interface forces file the ratio of the impact from the initial air inside the bag to the impact from the inflator particles, p_{air}. This output allows you to visualize the initial air effect for IAIR = 2 and 4.

2. Distribute control volume airbag data to local structure scratch file. The old scheme produced inconsistent results between runs when using more than one compute node.

§6 Contact

1. Added new pfile command "`contact { groupable_exclude_ag }`". This command will exclude ***CONTACT_AUTOMATIC_GENERAL** from groupable contacts, overriding any other setting. In some cases, groupable does not work well for **AUTOMATIC_GENERAL** in releases before R12.

§7 Control cards

1. Fixed a bug in 3D r-adaptivity (***CONTROL_ADAPTIVE** with ADPTYP = 7) that was causing incorrect stresses in non-adapted parts.

§8 Initial cards

1. Moved some initialization code for ***INITIAL_VEHICLE_KINEMATICS** to prevent it from referencing some data that did not yet exist, which was resulting in a segmentation fault.

§9 Discrete Element Method

1. Adjust and extend searching distance for DES to surface coupling searching for when the particle is moving between segments. This change gives a smoother contact force when the partical moves between segments and avoids the edge effect.

§10 eXtended Finite Element Method (XFEM)

1. Fixed bug in 2D XFEM (***SECTION_SHELL_XFEM** using ELFORM = 52) with plasticity material laws that was causing simulations to crash.

§11 MPP

1. Fixed load curve input processing error for MPP with predecomposition which was causing initialization errors in some rare cases.

2. Added new feature to ***CONTROL_MPP_DECOMPOSITION_REDECOMPOSITION** to estimate the element decomposition cost based on the element being in contact and the stress state of the element for better load balancing after redecomposition.

Listing 1

```
*PARAMETER
$    PRMR1      VAL1     PRMR2      VAL2
RuPLscXXa1 &R1uPllSARuPLscXXt1       0.0
```

§12 Miscellaneous

1. To improve memory performance, removed initial large allocation that was zeroing all of memory and thereby physically allocating it on Linux. This change restores behavior that existed in releases prior to R11.2.

2. Fixed bug in reading data cards of ***PARAMETER** that occurs if there is no space between a symbol and a value like in Listing 1.

Release Notes for R11.2.2

June 15, 2021

Contents

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§3 Documentation

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§4 Notes

The remainder of this file describes what's been added or fixed in version R11.2.2 since the release of version R11.2.1. See the release notes of R11.1.0, R11.2.0, and R11.2.1 to see what was added or fixed in those releases since R11.0.0. The changes are primarily bug fixes.

The items are arranged by category. In many cases, a particular item could fall under more than one category. For the sake of brevity, each item is listed only once under a single category.

§5 Adaptivity

- Fixed bugs that caused incorrect stresses of non-adapted parts for simulations involving adaptive EFG or adaptive FEM using 3D r-adaptivity. This adaptivity is invoked with ADPTYP = 7 on ***CONTROL_ADAPTIVE** with ***CONTROL_REMESHING** /***CONTROL_REMESHING_EFG**.
- Fixed bug in 3D r-adaptivity invoked with ***CONTROL_ADAPTIVE** (ADPTYP = 7) and ***CONTROL_REMESHING** when used with cases. The bug caused edges and corners to be lost during r-adaptivity after the first case.

§6 Contact

- Free hash table related to 2 sided force transducers in MPP, thereby fixing a resource exhaustion issue that caused them to stop working after 9 adaptive steps (or redecomposition steps).
- Fixed bug for ***DEFINE_FRICTION** which may have been giving incorrect results since July 2017.
- Enabled the tapered segment option invoked with SPOTHIN and SWRADF on ***CONTROL_CONTACT** to work wih segment-based (SOFT = 2) contact. This option tapers segments around spot welds. Also, the SWRADF factor on ***CONTROL_CONTACT** now works with solid element and solid element assembly spot welds.
- Fixed bug for MPP ***CONTACT_2D_AUTOMATIC** in which forces were not passed among processors. Until this update, this has never worked correctly.
- Added a cap on the number of buckets used in the bucket sort of segment-based (SOFT = 2) contact. If too many buckets are used, the bucket sort can run slower. This change will not affect crash models much but can be noticeable in bird strike problems with eroding contact when the domain of contact checking grows large.
- Fixed bug to prevent possible slowdown of the bucket sort in MPP SOFT = 2 eroding contact.
- Enabled ***DEFINE_CONTACT_VOLUME** to work with soft = 2 eroding contact.

§7 MPP

- Fix for MPP handling of ***DEFINE_CURVE_FUNCTION**. Specifically, if the built in function PIDCTL was used, along with MPP predecomposition, the behavior was unpredictable due to a memory clobber.

§8 Output

- Contact moment data was in some cases missing or incorrect in MPP.

- Properly initialize swforc temporary arrays used to gather data for the swforc file output in MPP, which could have resulted in some incorrect data being output to the swforc file in MPP.
- Added expanding the parameters in ***DEFINE_CURVE_FUNCTION** definitions before storing them in the `lsda` file.
- Fixed the strain output to `ELOUTDET` for shell element forms 13 and 14. The Jaumann update was rotating the strain only half way so that elements with significant rotation would report wrong strain. Also, the ***INITIAL_STRAIN_SHELL** that is generated by ***INTERFACE_SPRINGBACK_LSDYNA** had the same wrong values.
- Fixed bug for implicit tetrahedrons that occurred when TET10S8 = 1 on ***CONTROL_OUTPUT**. The bug caused corrupt `d3plot` files.
- Fixed bug causing NaN in `secforc` when using beam type 6 with zero area and length.

§9 Miscellaneous

- Store filename and format flag for ***INTERFACE_COMPONENT_FILE** into the structured file. With this change, if we convert keyword input to structured input and run from the structured input, LS-DYNA will know the required file format for the component data. Previously LS-DYNA always produced a non-`lsda` file when running from a structured file.
- Fixed some array declarations related to ***INTERFACE_LINKING** which was causing a segmentation fault.
- Report an exit code of 1 to the system in case of non-normal termination. Previously, we always returned 0 (no error) no matter what. This is in response to a user request.
- Fixed a padding error related to the handling of ***DEFINE_CURVE_FUNCTION** in double precision. This error would have only shown up if doing keyword to structured conversion in double precision and then running from the resulting structured deck (in single or double precision).
- Fixed a problem with ***NODE_TRANSFORM** when used with spot weld assembly generation. Spot weld elements were getting distorted.