

# NX Nastran 12.0.2 Release Guide



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## Availability (TAUCS)

As of version 2.1, we distribute the code in 4 formats: zip and tarred-gzipped (tgz), with or without binaries for external libraries. The bundled external libraries should allow you to build the test programs on Linux, Windows, and MacOS X without installing additional software. We recommend that you download the full distributions, and then perhaps replace the bundled libraries by higher performance ones (e.g., with a BLAS library that is specifically optimized for your machine). If you want to conserve bandwidth and you want to install the required libraries yourself, download the lean distributions. The zip and tgz files are identical, except that on Linux, Unix, and MacOS, unpacking the tgz file ensures that the configure script is marked as executable (unpack with `tar xzvpf`), otherwise you will have to change its permissions manually.



# Chapter 1: Caveats

## Caveats

The NX Nastran 12.0.2 maintenance release includes the following caveats.

- (PR 9005850) Requesting MONPNT3 output in a cylindrical or spherical coordinate system results in incorrect output.

Workaround: Only reference Cartesian coordinate systems for MONPNT3 output.

Problem originated: NX Nastran 12.0

This problem will be fixed in NX Nastran 13.

- (PR 7310163) For a model running SOL 101 which included a bolt preload on a beam element, contact on shell elements, and the contact conditions included friction and SHLTHK=0 defined on the BCTPARM entry, the applied moment loads and the SPC Force resultant output did not balance.

Workaround: None

Problem originated: NX Nastran 5.0





## Chapter 2: Problem Report (PR) fixes

### Problem Report (PR) fixes

The NX Nastran 12.0.2 maintenance release includes the following fixes.

PR#	Problem First Appeared	Problem Description
9110977, 9086286	12.0	<p>Incorrect results occur from SOL 601 or 701 when a concentrated mass and RBE2 element use the same grid point, and double-sided contact is defined.</p> <p>Workaround in previous releases: Create a dummy CONM2 element in the model. You can define the dummy CONM2 on a grid point which is separated from the rest of the model. The mass values you enter on the dummy CONM2 element will have no contribution to the model since it is unconnected. Its purpose is only to force the creation of a mass matrix.</p>
9145094	12.0	<p>When a SOL 401 Simcenter Multiphysics solution is run as a coupled solution, the structural solution needs to change the state back to the last converged multiphysics solution state before attempting another iteration of the structural run. This state was not getting properly reset for an unconverged multiphysics run.</p> <p>There is no workaround in previous releases.</p>
9138191	12.0	<p>If the case control for SOL 402 includes a TEMP(INIT) of ID1 selecting a TEMPD with ID1, and a TEMP(LOAD) of ID2 selecting a TEMPD of ID2, and if ID1&gt;ID2, the TEMP(INIT) was ignored. The model for this PR used the TVAR parameter default of "RAMP" on the NLCNTL2 entry. As a result, the temperature was ramped from 0 to TEMP(LOAD) during the first subcase instead of being ramped from TEMP(INIT) to TEMP(LOAD).</p> <p>Workaround in previous releases: Make sure that ID1 is smaller than ID2.</p>
8371864	12.0	<p>A SOL 402 input file included multiple contact sets in which some of the contact sets referenced a BCTPAR2 bulk entry but the first contact set did not. The first contact set incorrectly used the first defined BCTPAR2 entry, even though their IDs were different. This problem was revealed as a result of the ENABLE/DISABLE of contact in SOL 402.</p> <p>Workaround in previous releases: Make sure all BCTSET are associated with a specific BCTPAR2.</p>

9122372	10.0	<p>Using the system cell setting system(402) = 0.1 on the command line to resolve duplicate node IDs caused a fatal error.</p> <p>Workaround in previous releases: Use DPBLKTOL = 0.1 on the command line or in the input file to resolve the issue.</p>
9134575	1.0	<p>A model which included an external superelement ended with a fatal error during the data recovery solution step.</p> <p>There is no workaround in previous releases.</p>
9129193	12.0	<p>For a SOL 200 topology optimization solution, when the maximum number of cycles is exceeded without convergence, the following error occurs and the op2 file is corrupt or contains no results.</p> <pre> *** SYSTEM FATAL MESSAGE 6551 (INPTX2) A READ ERROR WAS DETECTED ON UNIT 112 DURING BINARY INPUTT2 PROCESSING PROGRAMMER INFORMATION: ..... </pre> <p>Workaround in previous releases: Use PARAM,NASPRT,1 to output all intermediate results. Note that the resulting .op2 file may be very large.</p>
9115701	12.0	<p>A coupled structural and thermal Simcenter Multiphysics solution failed to start Nastran on Windows 10. The problem was that on Windows 10 machines with security update KB4088787, NX Nastran was no longer initializing when starting multiphysics coupled solutions. The Nastran API function MpLaunch failed and returned error code 4. The whole error message is:</p> <pre> MpGetMessages returned code: 4; Function: MpLaunchDescription: Server Launch method failed. </pre> <p>Multiphysics uncoupled solutions solved fine.</p> <p>Workaround in previous releases: Turn off the Solution Monitor to allow the solution to proceed.</p>
9104061	10.0	<p>A model containing a BOLT bulk entry with ETYPE = 2 running SOL 111 produced the fatal error:</p> <pre> ATTEMPT TO ADD INCOMPATIBLE MATRICES, (SADD5) </pre> <p>The MMG matrix needed to be recalculated in the second solve due to modifications related to bolt preload that affect the matrix. Without this recalculation, the size of the matrix is different from what is expected, thereby causing failure in multiply/add scenarios in DMAP. The recalculation populates the correct value and fixes the size of the matrix, thereby allowing for multiply/add to function properly and produce correct results.</p> <p>There is no workaround in previous releases.</p>

8367433	12.0	<p>SOL 402 contact results showed the total and incremental sliding distance were unexpectedly different after the first increment. The origin of the problem was that, at a time point, the nodes were not projected onto the contact faces.</p> <p>There is no workaround in previous releases.</p>
8367301	12.0	<p>In SOL 402, a problem occurred with the translational gluing on an axisymmetric model. The gluing conditions incorrectly included the nodal rotations similar to how gluing occurs for shell elements. Since axisymmetric elements do not have rotational DOF, the glue condition did not work correctly.</p> <p>There is no workaround in previous releases.</p>
9102424	12.0	<p>When running SOL 402 from Simcenter, the time steps sizes displayed on the Simcenter solution monitor did not match with the time steps in the results AFU file. The time step printed on the monitor were incorrect for the case of a rejected time step. The time steps in the results AFU were correct.</p> <p>There is no workaround in previous releases.</p>
9100296	11.0.1	<p>Enforced displacements were incorrectly applied by the software on a model which included a BOLT bulk entry with ETYPE=3, running SOL 601 with the 3D iterative solver.</p> <p>There is no workaround in previous releases.</p>
9097590	11.0	<p>A SOL 401 Cyclic Modal free-free model with an RFORCE load produced the error:</p> <pre>*** SYSTEM FATAL MESSAGE 3001</pre> <p>The input file with this PR contained 2 subcases, the first one being a cyclic modes analysis and the second one a statics analysis subcase. RFORCE was specified on the model through a constrained grid. The Cyclic modal subcase was essentially a free-free response. The only constraint in this subcase existed on the RFORCE grid. SPCFORCE output was globally requested. With this setup, a fatal error occurred after the software computed the modes for harmonic 1 in the cyclic modes subcase.</p> <p>In cyclic modal analysis, for all intermediate harmonics (<math>0 &lt; \text{harmonic index} &lt; N/2</math>), the solution for each mode consists of a cosine and sine component. After computation of the modes and any derived results, the results are separated into the cosine and sine components for post processing. Although SPCFORCES are requested, no SPCFORCES were produced since the constrained grid wasn't connected to the rest of the model. As the S-Set (set of constrained DOF's) wasn't empty, the solver was expecting the presence of the datablock containing SPCFORCES for the purposes of separating into cosine and sine components.</p>

		<p>Workaround in previous releases: The SPCFORCE request for this type of model can be made in all the subcases where needed, but avoid requesting SPCFORCE for all subcases (globally).</p>
9085710	12.0	<p>SOL 402 analysis with DMP running in Simcenter failed. The problem was with the Simcenter solution monitor. When running DMP, each processor was trying to connect to the monitor, which unfortunately only accepts one connection at a time. NX Nastran has been modified to only connect to the monitor from the master processor (proc 0).</p> <p>Workaround in previous releases: You can disable the monitor.</p>
8543797	11.0.2	<p>A bolt in SOL 601 deformed in the axial direction only when the bolt axis was set to "Auto" on the BOLT entry. The bolt deformation was incorrectly predicted by the software when the local coordinate system was used to define the bolt.</p> <p>Workaround in previous releases: Setting bolt axis to "Auto" resolves the issue.</p>
9079165	12.0	<p>A SOL 402 model failed to converge which included multiple bolts with different orientations. The BOLT bulk entry included TYPE=3 with DIR&gt;0 and CSID=0. The problem also depended on the order of the bolts since it was related to an uninitialized variable.</p> <p>Workaround in previous releases: Switch to the cut-plane method (bolt type 2) on the BOLT entry.</p>
9084328	1.0	<p>For SOL 111, if each subcase has a different FREQ card, the displacements were printed for only the first subcase. No displacements were printed for Subcase 2, 3 etc.</p> <p>There is no workaround in previous releases.</p>
8363290	12.0	<p>For SOL 402, the Nastran keyword SMP was ignored but the keyword PARALLEL was not ignored and worked properly. The following keywords can now be specified to use SMP:</p> <pre>smp=xxx parallel=xxx sys107=xxx</pre> <p>where xxx is the number of SMP threads to be started.</p> <p>Workaround in previous releases: Use PARALLEL keyword instead of SMP.</p>

<p>8362037</p>	<p>12.0</p>	<p>In a SOL 200 Topology Optimization problem, a fatal error occurred if the model included non-topology elements and manufacturing constraints.</p> <p>The manufacturing constraints (including default checkerboard) cannot be used together in the model with the following elements types: CBAR, CBEAM, CBUSH, CBUSH1D, CDAMP*, CELAS*, CFAST, CGAP, CMASS*, CONM*, CONROD, CPLSTN*, CPLSTS*, CQUADX*, CROD, CSHEAR, CTRAX*, CTUBE, CVISC, CWELD. Elements that can be used together with the manufacturing constraints are CTRIA*, CTRIAR, CQUAD*, CQUADR, CHEXA, CPENTA, CPYRAM, CTETRA (supported elements for topology optimization design area) and RBAR, RBE*, RROD (not in design area).</p> <p>Workaround in previous releases: With the following element types: CDAMP*, CELAS*, CFAST, CGAP, CMASS*, CONM*, CVISC and CWELD, the issue can be avoided by assigning their IDs larger than any of the elements supported by topology optimization regardless if the supported elements are active or inactive.</p>
<p>8361246, 9093938, 8365671</p>	<p>7.0</p>	<p>A vibro-acoustic solution running SOLs 108 or SOL 111 with static pre-loads terminated when contact and bolts were included.</p> <p>The fix involved filtering out the fluid DOF during the static solution and to solve only the structural model. The presence of these fluids DOF was the cause of the problem during the static solution.</p> <p>There is no workaround in previous releases.</p>
<p>9060518</p>	<p>1.0</p>	<p>Non-zero rigid modes (small but not zero) were not processed correctly when calculating the structural responses for the response spectra input in the normal modes analysis. In this model, the Lanczos method produced the zero rigid mode while the Householder and Givens methods generated non-zero rigid modes. As a result, the Lanczos method worked fine, but not the Householder and Givens methods. The wrong results were due to improper handling of the rigid modes in the structural response.</p> <p>There is no workaround in previous releases.</p>
<p>9053509</p>	<p>11.0.1</p>	<p>Using the system cell definition SYS309 = 1 in SOL 115 produced an excessively high principal stress on CHEXA elements.</p> <p>Workaround in previous releases: Using sys309 = 0 resolves the issue.</p>

9041169	12.0	<p>Residual vector request slows the SOL 111 computation time.</p> <p>For this model, two solutions were compared. When the user deactivates the residual vectors, they obtain a 20x gain in performance. The problem is that the matrix containing all these vectors is being treated as dense resulting in much wasted effort.</p> <p>Workaround in previous releases: Define the system cell <code>sys129=1</code> to force NX Nastran to split one of the triple matrix products into two separate matrix multiplies. This then treats the residual vector matrix as sparse, and it goes much faster (almost a factor of 15).</p>
8356744	12.0	<p>SOL 402 ended with an error on Windows when at least one subcase is a MODAL, BUCKLING, FOURIER or CYCMODES subcase, and you are running over a network and the path includes spaces. Using the Windows short names is not a workaround. The error message in the f06 file is similar to the following:</p> <pre>5.6. EXECUTION OF THE SHELL COMMAND: "%NXN_ISHELLEXE%\nxns-dyst" dynam 2 USE_L# # Abnormal shell termination.</pre> <p>Another message appears in the log file, truncated at the first space:</p> <pre>'\\plm\Transfert\SAMTECH' is not recognized as an internal or external command, operable program or batch file. Where the Nastran path is: \\plm\nastran install\NXNastran12.0MP1\bin</pre> <p>(note the space between nastran and install)</p> <p>If running a sequential computation, you will not have the results of the modal computation, only the statics.</p> <p>If running DMP, the MPI processes will hang.</p> <p>Workaround in previous releases: If possible, when working over the network, make sure that the path does not contain spaces.</p>
8351716	12.0	<p>For SOL 402, nodes belonging to only CELAS2 elements without belonging to structural elements had no results from a MODES subcase.</p> <p>There is no workaround in previous releases.</p>
9112707, 9114508, 9120130	12.0	<p>When setting <code>PARAM,INREL,-2</code> in SOL 101, incorrect results were output for parabolic elements.</p> <p>Workaround in previous releases: In version 12.0 an automatic option was introduced to avoid 2x2 pivoting in DCMP for models with <code>PARAM,INREL,-2</code>. The approach causes the wrong results. You can use <code>PARAM,LMSCAL,1.0</code> to deactivate the option.</p>

9115761	12.0	<p>NX Nastran did not compute correct ERP results in a SOL108 vibro-acoustics analysis. The SET3,GRID option for panel definition did not work for the ERP capability.</p> <p>There is no workaround in previous releases.</p>
9109908	12.0	<p>In version 12.0, PARAM,AGGPCH was added specifically to punch the acoustic coupling matrix when requesting punch output for external superelements. The initial implementation incorrectly produced numerical zeroes.</p> <p>There is no workaround in previous releases.</p>
9098920	12.0	<p>A model with a fluid structural interface crashed when OPRESS was requested. OPRESS results for shell elements were not supported in NXN 12.0. They are now supported in NXN 12.0.2.</p> <p>There is no workaround in previous releases.</p>
9074280	12.0	<p>For an acoustics model with an ATV, there is an issue with the interpolation of ATVs in the ATV Response if the solution frequencies are different than the ones from the ATV frequencies. The interpolated acoustic solution resulted in a step-like response instead of a smooth response.</p> <p>There is no workaround in previous releases.</p>
9095486	8.5	<p>Residual vectors were not computed when running RDMODES.</p> <p>RDMODES now supports residual vectors for RVDOF and RVEL options.</p> <p>There is no workaround in previous releases.</p>
9109915	12.0	<p>Incorrect frequency response function (FRF) interpolation. Equations for unrolling the phase while interpolating FRFs were incorrect in 12.0.</p> <p>There is no workaround in previous releases.</p>
8351720	12.0	<p>In a Subcase - Cyclic Modes in SOL402, the norm of eigenvectors was incorrect when using Lanczos (EIGRL) and MASS for the Method for Normalizing Eigenvectors.</p> <p>The normalization related to the mass matrix now gives the expected results.</p> <p>There is no workaround in previous releases.</p>
	12.0	<p>The behavior of PARAM, K6ROT is different for SOL 401 and 402 when it is input as 0.0. While SOL 402, internally sets it to 100.0, the value for SOL 401 was left unchanged.</p> <p>Now the K6ROT value for SOL 401 has been changed to 100.0 and thus consistent with SOL 402.</p> <p>There is no workaround in previous releases.</p>

	12.0	<p>Incomprehensible error message when running FEMA0 with static pre-loads.</p> <p>Now, when a static preload subcase is used via the STATSUB command, a clarifying message occurs for SOL 108 and SOL 111 FEM Adaptive Order solutions.</p> <p>There is no workaround in previous releases.</p>
	12.0	<p>When the number of bolts of type 2 in SOL 401 are high (such as 60), the software hits a memory limit and produces a fatal error.</p> <p>The memory allocation issue that caused this bug has been fixed.</p> <p>Workaround in previous releases: Using type 3 bolts instead of type 2 resolves the issue.</p>
	8.0	<p>In SOL 101 and 401, unused MATFT entries were not ignored in the presence of the MATDMG entry. This resulted in incorrect failure index output with all zeros.</p> <p>Workaround in previous releases: Specify only the necessary MATFT cards.</p>
	11.0	<p>For Frequency Response solutions 108 and 111, an MPI is used to pass allocated data to slave nodes. However, when the data has a larger size than the maximum integer allowed by MPI (32bit interface), an integer overflow issue would occur.</p> <p>This has been addressed by checking the data size and sending the data using more passes if needed.</p> <p>There is no workaround in previous releases.</p>
	8.0	<p>For SOL 101, when there is contact, constraint elements (or MPCs) in the model, and if PARAM,CNTASET,YES is defined, a SYSTEM FATAL MESSAGE 3001 (GP4) is produced.</p> <pre> *** SYSTEM FATAL MESSAGE 3001 (GP4) THE OUTPUT DATA BLOCK IN POSITION 1 DOES NOT EXIST. ..... </pre> <p>Workaround in previous releases is possible with an alter:</p> <pre> compile phase0,nolist \$ alter 1843,1843 \$ GP4 CASEW,GEOM4S,EQEXINS, SILS,GPDTS,BGPDTS,CSTMS, MEDGE,MFACE,,GEOM2S,GDNTAB,GPECT0,/ RMGX,,USET0,/ LUSSETS/S,N,NOMSET/0/S,N,NOSSET/0/S,N,NORSET/ NSKIPX/0/0/0/0/SEID/ALTSHAPE/SEBULK/ DMAPNOX/AUTOMPC/AMPCZ/RONLY/NLBEAR/ISPCSTR \$ endalter \$ </pre>





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