

***CONTROL_CHECK_{OPTION}**

Available options include:

<BLANK>

SHELL

Purpose: Check for various problems in the mesh.

(*OPTION* = **SHELL**) (include one card for each part to be checked, or use part set ID for PSID)

Card 1 1 2 3 4 5 6 7 8

Variable	PSID	IFAUTO	CONVEX	ADPT	ARATIO	ANGLE	SMIN	
Type	I	I	I	I	F	F	F	
Default	0	0	1	1	0.25	150.0	0.0	

<u>VARIABLE</u>	<u>DESCRIPTION</u>
PSID	Part/part set ID to be checked: EQ.0: do not check GT.0: part ID LT.0: part set ID
IFAUTO	Flag to automatically correct bad elements: EQ.0: write warning message only EQ.1: fix bad element, write message
CONVEX	Check element convexity (internal angles less than 180 degrees) EQ.0: do not check EQ.1: check
ADPT	Check adaptive constraints EQ.0: do not check EQ.1: check
ARATIO	Minimum allowable aspect ratio. Elements which do not meet minimum aspect ratio test will be treated according to IFAUTO above.
ANGLE	Maximum allowable internal angle. Elements which fail this test will be treated according to IFAUTO above.

<u>VARIABLE</u>	<u>DESCRIPTION</u>
SMIN	Minimum element size. Elements which fail this test will be treated according to IFAUTO above.

Remarks:

1. For the SHELL option, shell element integrity checks which have been identified as important in metal forming applications are performed. These checks can improve springback convergence and accuracy. This option will repair bad elements created, for example, during trimming operations.
2. If the convexity test is activated, all failed elements will be fixed regardless of IFAUTO.
3. In addition to illegal constraint definitions (slave which is also a master), checks are performed for mesh connectivities which have been found to cause convergence trouble in implicit springback applications.
4. Variable SMIN should be set to 1/4 to 1/3 of smallest pre-trim element length. In an example below, smallest element length pre-trim is 0.6mm, which makes SMIN to be 0.18:

```
*CONTROL_CHECK_SHELL
1,1,1,1,0.25,150.0,0.18
$ smin=(0.25~0.3)*smallest pre-trim element length, which is ~0.6 mm.
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5. Shell checking is done during the input phase (in sprinback input deck) in LS-DYNA R5 Revision 63063 and prior releases. After the Revision, it is done after trimming is completed. Therefore the keyword should be included in a trimming input deck.