*CONTROL_FORMING_AUTO_NET

Purpose: This keyword facilitates springback simulation of a formed panel on resting nets of a checking fixture. With this keyword, nets are automatically generated according to specified dimensions and positions.

Card Format (I10, X10, 2I10, 3E10.0)

Card 1	1	2	3	4	5	6	7	8
Variable	IDNET	ITYPE	IDV	IDP	X	Y	Z	
Type	I		I	I	F	F	F	
Default	none		0	0	0.0	0.0	0.0	

Card Format (3E10.0)

Card 2	1	2	3	4	5	6	7	8
Variable	SX	SY	OFFSET					
Type	F	F	F					
Default	0.0	0.0	0.0					

Cards 3,4,5,6… repeat Card 1 and 2, as many times as needed to define multiple nets. The next "*" card terminates the input.

VARIABLE	DESCRIPTION
IDNET	ID of the net; must be unique.
ITYPE	Not used at this time.
IDV	Vector ID indicating the direction of the net to be generated. See *DEFINE_VECTOR for details. If not defined, the net will be generated along the global Z-axis.
IDP	Part ID of the panel undergoing springback simulation.

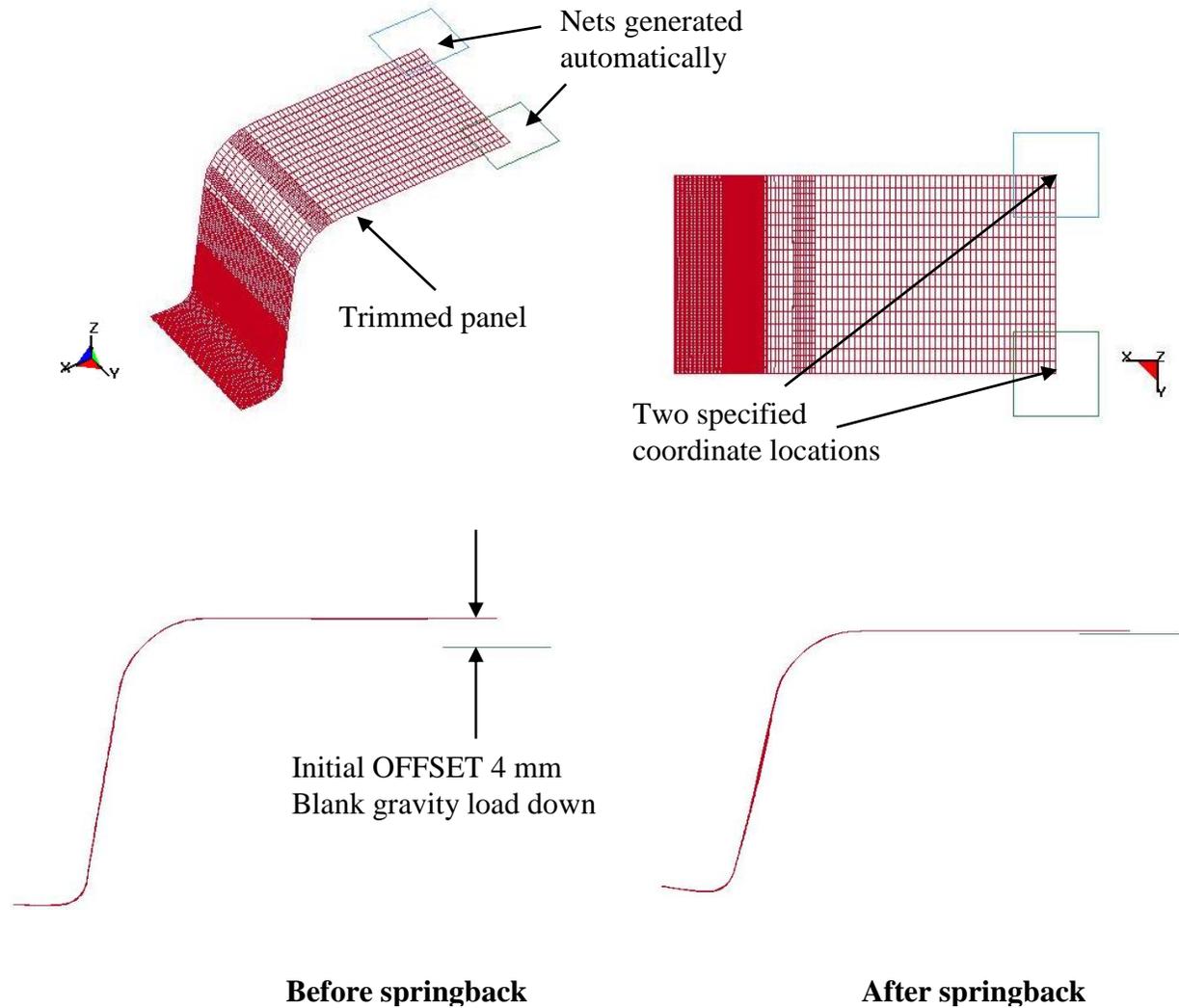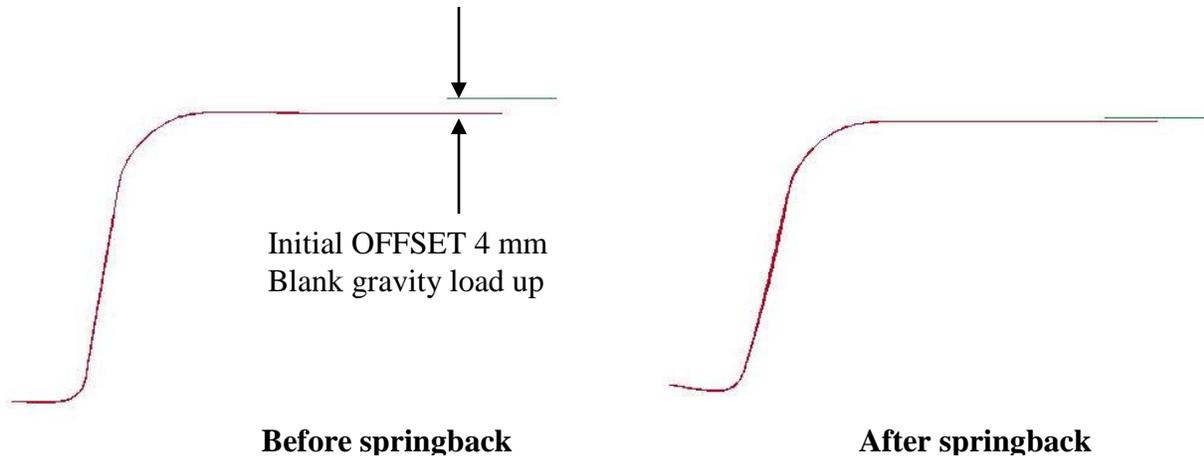| VARIABLE	DESCRIPTION
X	X-coordinate of a reference point for the net to be generated.
Y	Y-coordinate of a reference point for the net to be generated.
Z	Z-coordinate of a reference point for the net to be generated.
SX	Length of the net along X-axis.
SY	Length of the net along Y-axis.
OFFSET	The net will be generated at this offset distance away from the reference point. GT.0: the net will be on the global +Z side, or on the vector head side if IDV is defined. LT.0: the net will be on the global −Z side, or on the vector tail side if IDV is defined.

Remarks:

1.   IDNET is not Part ID of the net to be created. For each X, Y, Z position one net of different part ID will be generated. Part IDs of the generated nets will follow the last part ID in the model and increase in ascending order and is automatically generated. Other properties such as section, material properties and contact interfaces are also established between the panel and nets within the code. Contact type *CONTACT_FORMING_ONE_WAY_SURFACE_TO_SURFACE is used. Currently, the default type of the net is rectangular in shape.

2.   Multiple nets can be generated using one such keyword. In a keyword example shown below, nets ID 1 through 4 are to be generated on the tail side of the vector ID 89, at 4mm away from each respective reference point defined by X, Y and Z coordinates. This example input can be included in a usual springback simulation input deck (without the SPC constraints anywhere) to complete the input file to simulate the panel springback on nets. Gravity load needs to be included.

```
*CONTROL_FORMING_AUTO_NET
$---+----1----+----2----+----3----+----4----+----5----+----6----+----7----+----8
$    IDNET     ITYPE       IDV     IDP        X         Y         Z
         1                  89       5   2209.82  -33.6332   1782.48
$     SX        SY     OFFSET
      15.0      15.0      -4.0
$    IDNET     ITYPE       IDV     IDP        X         Y         Z
         2                  89       5   3060.23  -33.6335   1782.48
$     SX        SY     OFFSET
      15.0      15.0      -4.0
$    IDNET     ITYPE       IDV     IDP        X         Y         Z
         3                  89       5   3061.21   31.4167   1784.87
$     SX        SY     OFFSET
      15.0      15.0      -4.0
$    IDNET     ITYPE       IDV     IDP        X         Y         Z
         4                  89       5   2208.84   31.4114   1784.87
```

```
$        SX        SY      OFFSET
      15.0      15.0       -4.0
*DEFINE_VECTOR
$ VID, Tail X, Y, Z, Head X, Y, Z
89,0.0,0.0,0.0,0.0,0.0,100.0
```

3.   Two examples are shown in the following figure, where a trimmed blank is gravity loaded in -Z direction and in +Z direction and the corresponding springback shapes are calculated.

Before springback   After springback

Initial OFFSET 4 mm
Blank gravity load up

Before springback   **After springback**

3.   This feature is now available in Implicit Static in LS-DYNA R5 Revision 62781 or later
       releases.