APPENDIX Q: User Defined Weld Failure

The addition of a user weld failure subroutine into LS-DYNA is relatively simple. The UWELDFAIL subroutine is called every time step when OPT = 2 is specified in MAT_-SPOTWELD. As data, the identification number for the spotweld material, six constants specified in the input by thfe locations NRR through MTT, the radius of the cross section of the spotwelds, the current time, and the current values of the resultants for the spotwelds, which are stored in array STRR, are passed to the subroutine. The subroutine loops over the welds from LFT through LLT, and sets the values of the failure flag array FLAG.

```
      SUBROUTINE UWELDFAIL(IDWELD,STRR,FAIL,FIBL,CM,TT,LFT,LLT)
C*************************************************************
C|  LIVERMORE SOFTWARE TECHNOLOGY CORPORATION  (LSTC)          |
C|  ------------------------------------------------------    |
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C|  ALL RIGHTS RESERVED                                        |
C*************************************************************
C
C***  SPOTWELD FAILURE ROUTINE
C
C***  LOCAL COORDINATES: X IS TANGENT TO BEAM, Y & Z ARE NORMAL
C
C***  VARIABLES
C          IDWELD ---- WELD ID NUMBER
C          STRR ------ STRESS RESULTANTS
C                      (1) AXIAL (X DIRECTION) FORCE
C                      (2) Y SHEAR FORCE
C                      (3) Z SHEAR FORCE
C                      (4) MOMENT ABOUT Z
C                      (5) MOMENT ABOUT Y
C                      (6) TORSIONAL RESULTANT
C          FAIL ------ FAILURE FLAG
C                      = 0 NOT FAILED
C                      = 1 FAIL ELEMENT
C          FIBL ------ LOCATION (1,*) GIVES THE SPOTWELD DIAMETER
C          CM -------- 6 CONSTANTS SUPPLIED BY USER
C          TT -------- CURRENT SIMULATION TIME
C          LFT,LLT --- DO-LOOP RANGE FOR STRR
C
      DIMENSION IDWELD(*),STRR(6,*),FAIL(*),CM(*),FIBL(5,*)
C
C
      RETURN
      END
```