

# PROCESS SPECIFICATION

## DELPHI SAGINAW STEERING SYSTEMS

TITLE Tool Material Heat Treatment NUMBER E-2646  
ISSUED BY C. R. Martin DATE 4/30/96 APPROVED BY \_\_\_\_\_  
REVISION D REV. DATE 08JL2003 SHEET 1 OF 1

- A. Material to be heat treated: **H19**
- B. Heat treatment for atmosphere controlled furnace
- C. Heat treat as specified:
1. Preheat slowly to 1500°F.
  2. High heat at 2000 to 2200°F.
  3. Air quench to 120°F. or below
  4. Triple temper immediately, 4 hours minimum at 1000 to 1300°F, for each temper.
  5. Air cool to room temperature between tempers.
- D. Stress relieve after final machining at 800°F.
- E. Using heat treatment shown above will give a hardness range of 40 to 57 Rockwell C. Required hardness will be noted on print. Heat treat accordingly.
- F. Any tooling heat treated in salt, which contains holes, must have holes cleaned of all salt.
- G. Heat treatment certification, when requested, shall include:
1. Heat treat shop number
  2. P.O. number accompanying job
  3. Type of material heat treated
  4. Size and quantity of tooling batch heat treated
  5. Resulting hardness
  6. Xerox copy of material tracking chart containing furnace times and temperatures.
  7. Date when hardness tester last calibrated.
- H. Heat treatment per this specification is to be carried out only by approved sources as listed in Specification E-2600.

Revision	Revision Description	By	Date
A	Distribution list updated.	CRM	5/16/96
B	Distribution list revised. Format updated.	DN	1/24/01
C	Salt reference removed	DN	6/11/02
D	Distribution note removed. Approved source note added.	DN	08JL2003

[http://www.delphisuppliers.com/vendor\\_documents/delphi-s/index.html](http://www.delphisuppliers.com/vendor_documents/delphi-s/index.html)

Note: The above specifications were developed without considering whether patents may or may not be involved.  
In all cases, therefore, the supplier shall be required to assume patent liability.