

PROCESS SPECIFICATION

DELPHI SAGINAW STEERING SYSTEMS

TITLE Tool Material Heat Treatment NUMBER E-2639
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: **S1**
- B. Heat treat as specified: (heat slowly)
1. Preheat slowly at 1000 to 1200°F. (Preheat step optional)
 2. High heat at 1650 to 1750°F.
 3. Oil quench.
 4. Double temper immediately at 350 to 1200°F, air cooling to room temperature between tempers. The first temper should be 50 to 100 °F lower than the final temper.
- C. Stress relieve, if specified, after final machining at a temperature which is 50 to 100 degrees lower than the tempering temperature used. The stress relieving temperature should not, in any way, affect the hardness of the material.
- D. Using heat treatment shown above will give a hardness range of 40 to 58 Rockwell C. Required hardness will be noted on print. Heat treat accordingly.
- E. No carburization or decarburization allowed.
- F. Tooling 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.
- I. All printed copies of this specification are FOR REFERENCE ONLY. The latest revision can be viewed on-line at: http://www.delphisuppliers.com/vendor_documents/delphi-s/index.html

Revision	Revision Description	By	Date
A	Distribution list updated.	CRM	5/16/96
B	Distribution list revised. Format updated.	DN	1/24/01
C	Double temper added	DN	6/11/02
D	Note H revised. Note I added.	DN	08JL2003

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.