Heat treatment after carburizing

- Core & case exhibit overheated structures which are unsatisfactory for severe service
- Carburized parts are heat treated
  - to refine the core
  - to refine and harden the case

To refine the grain of the core -
and consequently toughening it, the part is heated to just above its upper critical temperature (about 870c for the core) when the coarse ferrite - pearlite structure will be replaced by refined austenite crystals. The component is then water or oil quenched to give a fine dispersion of ferrite in martensite.

For refining the case,
the component is again heated to about 760°C, so that the coarse martensite of the case changes to fine grained austenite. quenching then gives a fine grained martensite in the case.

Finally the component is tempered at about 200°C to ~~retet~~ relieve any quenching strains present in the case.

This treatment is highly desirable from a theoretical approach, but generally the heat treatment of a case hardened steel is modified under certain conditions.