



Fig. 195 Elastic-plastic analysis of the **optimized unstiffened equivalent ellipsoidal shell with the thick apex with $t(\text{apex}) = 0.4$ inch; $W_{imp}=0.2$ inch; the optimum design is listed in Table 78.** State of the shell at load set B (PB) step no. 40 at the end of Run 2. (See Fig. 193). This is the **residual dent**. Load set B consists of a number of concentrated normal inward-directed imposed **displacements** applied along the junction of Shell segments 3 and 4 (Figs. 2, 169, 181, 190, 191) distributed as $\cos(\theta)$ from $\theta = 0$ to 90 degrees in the circumferential coordinate along Row no. 5 in Shell Units 11 and 12. (See Table a40). This imposed normal displacement distribution is used because it generates a residual dent that **locally** resembles the deformation in Figs. 190 and 191, that is, the linear buckling modal imperfection with $n = 1$ circumferential wave. Compare with Fig. 182, for which a $\cos(\theta)$ distribution of concentrated normal inward-directed loads generates the dent rather than normal inward-directed imposed displacements.