CASE STUDY

2026 Award of Distinction in the Lawn & Garden/Off-Highway category for conventional PM components

Shift Arm

Process:
Conventional Press & Sinter (PM)

Material:
F-0008-30 carbon steel

Density:
6.6 g/cm^3

Hardness:
60 HRB minimum

UTS:
290 MPa

End Use and Function
The shift arm links a driver's shift knob to the transmission in a commercial landscape utility cart. A tapered double-D through-hole interlocks with the shaft to transfer selector motion.

Fabrication
Five compacted levels are formed with three lower and two upper punches on a servo-electric press. A controlled plunging punch creates the tapered double-D feature. After sintering, resin impregnation seals the part for machining and plating. Cross and through holes are machined, followed by yellow-chromate zinc plating.

Results
The PM process forms the critical tapered drive feature and multi-level body efficiently. Servo-electric compaction reduces energy use compared with hydraulic pressing, while plating provides corrosion protection and a finished appearance.