

DOC345 - DESIGN REVIEW CHECK LIST – Pg 1 OF 4

Date: _____

AZ job number: _____

Customer part number: _____ **Rev Level:** _____

Operation number: _____

- | | | | |
|---|-----|----|-----|
| 1. Was designer familiar with or reviewed AZ Automotive die standards prior to design start? | Yes | No | N/A |
| 2. Has initial strip layout or flowchart been approved? | Yes | No | N/A |
| 3. Has press and alternate press been assigned? | Yes | No | N/A |
| 4. Design using minimal amount of material, stock width and progression. | Yes | No | N/A |
| 5. One out w/side carrier, two out center carrier. Is there sufficient tension on part to stop wiggle/flopping to enable die to run at peak rate? | Yes | No | N/A |
| 6. Design meets optimum process. | Yes | No | N/A |
| 7. Die size verification. | Yes | No | N/A |
| 8. Blank size. | Yes | No | N/A |
| 9. Verification of stock. | Yes | No | N/A |
| 10. Pitch or French notch and sensors to detect short feed. | Yes | No | N/A |
| 11. Punch holder and die holder thickness adequate. | Yes | No | N/A |
| 12. Steel split in proper places, easily removed in press. | Yes | No | N/A |
| 13. Stock lifters or spring pads to lift stock through die. | Yes | No | N/A |
| 14. Sheddors provided around all pilots. | Yes | No | N/A |
| 15. When staggering punches, vary retainer height to keep standard punch length. | Yes | No | N/A |
| 16. Long enough chute to assist in leading material into stock guides and die. | Yes | No | N/A |
| 17. Form steels to be supported over parallels. | Yes | No | N/A |
| 18. Prog dies to have separate pads for trimming and forming, with pad balancers. | Yes | No | N/A |
| 19. Trim sections to have radius at corners whenever possible to prevent sections from cracking. | Yes | No | N/A |
| 20. Can dies be handled by our hi-low: size of fork, spread, and pick up evenly, weight? | Yes | No | N/A |
| 21. Risers are to be positioned so all scrap can be pushed out from one side of die or permit conveyor usage. | Yes | No | N/A |
| 22. Is the web strong enough? | Yes | No | N/A |
| 23. Pierce operations after final form and re-strike. | Yes | No | N/A |
| 24. Windows in strippers. | Yes | No | N/A |
| 25. No spring to bear against the ram. | Yes | No | N/A |
| 26. Notching, forming, and cutoff sections to be properly heeled. | Yes | No | N/A |

DOC345 - DESIGN REVIEW CHECK LIST – Pg 2 OF 4

Date: _____

AZ job number: _____

| | | | |
|---|-----|----|-----|
| 27. Welding of tool steel is permitted only by written permission for each weld by AZ Automotive Program Manager. | Yes | No | N/A |
| 28. Proper working form steel type. Insert. | Yes | No | N/A |
| 29. Four (4) stop blocks required. | Yes | No | N/A |
| 30. Proper part ejection. | Yes | No | N/A |
| 31. No holes or cutouts within 1/2" of working area, pilots, etc. | Yes | No | N/A |
| 32. Must be designed to keep finished parts and scrap separated. | Yes | No | N/A |
| 33. If volume is above 30,000 hits per mo. Spring compression not to exceed 25%, heavy duty 15% or use nitrogen cylinder. | Yes | No | N/A |
| 34. Has all areas of concern for part feeding been addressed? | Yes | No | N/A |
| 35. Has symmetrical parts been fool proofed? | Yes | No | N/A |
| 36. Has provisions, clearance been provided for access to air cylinders, electrical, hydraulic, fitting, etc.? | Yes | No | N/A |
| 37. Do the lifters have enough guide media? | Yes | No | N/A |
| 38. Have all issues of scrap shedding been addressed? | Yes | No | N/A |
| 39. Are there any poor trim conditions? | Yes | No | N/A |
| 40. Has space been provided for ejectors (scrap, part)? | Yes | No | N/A |
| 41. Is the tool design strong enough for intended use? | Yes | No | N/A |
| 42. Have all issues of die part sensing been addressed? | Yes | No | N/A |
| 43. Are there requirements for date/manufacture stamp on parts? Is this on design? | Yes | No | N/A |
| 44. Does the stroke of nitrogen cylinder fall within acceptable range? | Yes | No | N/A |
| 45. Do all pierce punches, pierce to maximum size as per customer requirement? | Yes | No | N/A |
| 46. Are all pierce sizes as per print/cad data? | Yes | No | N/A |
| 47. Are steels removable in press? | Yes | No | N/A |
| 48. Can pierce punches and buttons be removed in press? | Yes | No | N/A |
| 49. Is stripping force of all pads adequate? | Yes | No | N/A |
| 50. Can die be easily manufactured as designed? | Yes | No | N/A |
| 51. Is pad travel sufficient? | Yes | No | N/A |
| 52. Are cam drivers heeled or backed up for support and side thrust heeled. (Form, re-strike & flange) | Yes | No | N/A |

DOC 345 - DESIGN REVIEW CHECK LIST – Pg 3 OF 4

Date: _____

AZ job number: _____

| | | | |
|---|-----|----|-----|
| 53. Have all tolerance issues been discussed? | Yes | No | N/A |
| 54. All die lift requirements been addressed, balanced. (Fork lift pockets, if needed) | Yes | No | N/A |
| 55. All transfer equipment required down, timing curve, etc | Yes | No | N/A |
| 56. Transfer dies to have axis heeling with 1.5" minimum entry before pins. | Yes | No | N/A |
| 57. Transfer dies to have safety block areas as part of casting. Design doubling as die storage block area. | Yes | No | N/A |
| 58. Transfer die scrap chuted through bolster or chuted to edge of bolster, maximum size OK? | Yes | No | N/A |
| 59. Sub plate with dies under 20 ton total weight for transfer. | Yes | No | N/A |
| 60. No operator loading over pins, cams, heel blocks. | Yes | No | N/A |
| 61. Fool proof gauging to eliminate misleading of parts. | Yes | No | N/A |
| 62. Does part have method for location in die? | Yes | No | N/A |
| 63. Is shut height as required? With master plates? | Yes | No | N/A |
| 64. Has one heel and pin been offset? | Yes | No | N/A |
| 65. Are all castings of proper material? | Yes | No | N/A |
| 66. Is center line of tool and press show in design? | Yes | No | N/A |
| 67. Was die designed with press in mind? | Yes | No | N/A |
| 68. Have bottoming blocks been provided for pad spotting purposes? | Yes | No | N/A |
| 69. Do all aerial cams have positive returns? | Yes | No | N/A |
| 70. Are cams shown in contact as well as retracted positions? | Yes | No | N/A |
| 71. Can the cam be accessed in press? | Yes | No | N/A |
| 72. Are tooling holes or balls provided on cam designs? | Yes | No | N/A |
| 73. Is travel of cams sufficient to load and unload panel? | Yes | No | N/A |
| 74. Does the guiding media sufficiently engage prior to any work being done by die? | Yes | No | N/A |
| 75. Dies with upper pads, is there enough material to back up retaining pins 2" min. on casting. | Yes | No | N/A |
| 76. Dies with upper pads, is there enough material to back up retaining pins 2" min on casting. | Yes | No | N/A |
| 77. Are all air vents required to release trapped air? | Yes | No | N/A |
| 78. Are clamp slots and die locations acceptable? | Yes | No | N/A |
| 79. Do all wear plate bosses have a shoulder designed in? | Yes | No | N/A |
| 80. All form/draw dies are to be coated in high wear areas. | Yes | No | N/A |
| 81. Any spools in design? | Yes | No | N/A |
| 82. Is tonnage required correct, to make part fit assigned press? | | | |

DOC 345 - DESIGN REVIEW CHECK LIST – PAGE 4 OF 4

Date: _____

AZ job number: _____

- 83. Is tonnage required correct, to make part fit assigned press? Yes No N/A
- 84. Any spools in design? Yes No N/A

Approval (signatures)

Tool Shop: _____

AZ Automotive: _____
