16. Ford Zetec Engine

The Ford Zetec ZX3 engine shall conform to the following specifications and may be modified only as specifically allowed. If these specifications do not explicitly allow a modification, then it may not be done. The philosophy of the Zetec engine in FC is to allow limited engine rebuilds but no performance modifications to the engine. Blue printing, balancing, head porting, polishing, etc. are strictly prohibited and against the spirit of the Zetec formula. Where Ford part numbers are specified, normal industry part number supersession is expected and the superseding part numbers are automatically included.

a. The cylinder head may not be ported or polished. Machining the cylinder head is not permitted except as specified in these rules. A standard three-angle "production" valve job is required and the only allowed angles are those defined in the Ford factory manual. The intake valve seats must be 30° 45° 70° with the 45° face a minimum 1.5 mm wide. The exhaust valve seats must be 30° 45° 55° with the 45° seat 1.5 mm wide minimum. *Valve seats and guides may be replaced providing that they remain in the original stock locations.* The camshaft, valves, springs, and shim/bucket components must be original Ford parts and may not be modified in any way. Only original unmodified Ford parts may be used for direct replacement. The camshafts must remain as ground by Ford; no polishing is permitted. ~~Valve seats may not be replaced.~~ The head may not be surfaced or milled beyond the minimum thickness of 5.230" measured between the cam cover seating surface and the lower plane of the head. Only the Ford #RFYS4E6090AC or RFYS4E6090AD head is allowed. The only allowed camshafts are the Ford #L913B YSAA intake and #L913B C2B exhaust. The original, unmodified Ford camshaft and crankshaft timing pulleys must be used. Required camshaft timings are as follows:

Intake centerline	116-117 degrees ATDC
Exhaust centerline	106-107 degrees BTDC

b. ~~Pistons, c~~ *Only original Ford or Sealed Power H872cp pistons may be used. C*rankshaft~~,~~ and rods may be replaced only with standard original Ford replacement parts. The crankshaft*, rod and main bearing journals* may be *re*ground or polished for the purpose of installing oversize main or rod bearings. ~~The rod journals must remain stock and the rods may not be bored or remanufactured in any way~~. ~~The rod and crankshaft bearings may be replaced only with original or oversized Ford bearings.~~ *The big end of the connecting rod may be honed to fit .002 inch larger rod bearings. Connecting rod bearings may be replaced with unmodified bearings which are specifically designated for use in this engine.* The required original crankshaft main bearing journal dimension is 2.282-2.283 inches and the required original crankshaft rod journal dimension is 1.846-1.847 inches. The corresponding main journal dimensions for oversized bearings are either 2.273-2.274 inches or 2.263-2.264 inches; the corresponding rod journal dimensions for oversized bearings are either 1.837-1.838 inches or

1.827-1.828 inches. The crankshaft centerline to deck dimension is 8.378 inches and may not be altered. The main bearing housing bore is 2.452-2.453 inches and the rod housing bore is 1.9642-1.9650 inches. Only original Ford rod bolts with a minimum weight of 24.6 grams or ARP rod bolts with a minimum weight of 23.5 grams may be used.

c. Only original stock Ford replacement piston rings *(part number 2S4Z6148AA) or Hastings Rings (part number 2M4887 Std)* may be used. The ring end gaps may not be altered and must remain as manufactured ~~by Ford~~. All of the rings must be installed including the complete oil scraper assembly. The piston bore may be honed solely to allow piston ring seating. The first and second compression rings must be installed in the positions designated by *the manufacturer* ~~Ford~~.

d. All surfaces on the head, block, rods, pistons, and crankshaft must remain as manufactured ~~by Ford~~ and may not be altered in any way *unless specifically provided for in these rules*. The original casting marks and cast surfaces must remain as-cast and also meet all of the Ford design values and tolerances as stated in the Ford factory manual or as delineated in these specifications. The block may not be decked. Only Ford Zetec ZX3 blocks with block numbers #RFYS4G6015AA, or #RFYS4G6015AD or #RFYS4G6015AE are permitted. *The blocks may be sleeved however all bore tolerances must remain stock or as otherwise provided for in these rules.* The required compression ratio is 9.6:1, the required standard bore is 3.3390 – ~~3.3410~~ *3.3420* inches and the required stroke is 3.461 *+/-.004* inches. The maximum bore dimension of ~~3.3410~~ *3.3420* inch is intended to allow for cylinder wear only. It is not permitted to machine to this dimension. This measurement will be taken .250 below the block deck where the bore is untouched by the piston ring.

e. Flywheel: The minimum weight is 8.0 lbs. and any weight removal from the specified flywheel must come from the clutch plate surface. *The friction and clamping force surface of the flywheel may be resurfaced.* Only the Quarter Master #QM107160 flywheel may be used. *It is permitted to install a new ring gear on the flywheel.*

f. Any 7¼ inch single plate or double plate, non-carbon fiber clutch is allowed.

g. Any oil pan is allowed. The oil pan may not contain an oil scraper between the oil pan and the block. No device in the oil pan may be contoured to the crankshaft assembly to function as an oil scraper nor may any device be closer to the rotating crankshaft assembly than 0.500 inches.

h. Any three-stage oil pump with a maximum of two scavenge stages is allowed. The maximum scavenge rotor dimensions are 1.600 inches in diameter and 1.375 inches in length. The maximum pressure rotor dimensions are 1.600 inches in diameter and 0.863 inches in length.

i. The exhaust system manifold tubing OD must be 1.5 inches (as measured 1.00 inches or more from the head). The manifold tubes must be a minimum of 24 inches in length and must terminate into a single exhaust pipe through a 4 into 1 collector. The collector angles must be the standard 15 degree bend, (30 degree included angle) with an exit diameter of 2 inches. The tail pipe must be a minimum of 24 inches in length. The tail pipe in-

cludes a muffler, if present, as long as the inlet and outlet pipes of the muffler are the same diameter as the tail pipe. 4 into 2 into 1 exhaust collectors or reduced diameter venturi sections are prohibited.

j. ECU: The Pectel T2 *or the Performance PE-3* unit is required. The current specification SCCA Club map or 2013 Pro map as published by SCCA is required. The SCCA Club and 2013 Pro map are available on the SCCA website.

k. Intake manifold and fuel injection components: The Quicksilver Race Engines (QSRE) intake air scoop, intake manifold, throttle bodies, air horns, fuel rail*,* ~~and~~ injector system*, pressure regulator and carbon fibre air scoop with filter* are required and must be used with no modifications of any kind *unless specifically provided for in these rules*. *(Due to the aging of the air scoops alternative means of securing the filter will be permitted which may include modifications to the debris tube and other mounting hardware. The air scoop however must have a minimum .430 inch operable air bleed at its rear most point.)* The only allowed intake manifold and throttle body combination is the #0138 manifold available through QSRE. Only ~~stock Ford~~ *19 pound* fuel injectors may be used and they may not be modified in any way. Fuel injectors may be replaced only with stock Ford injector part number #0280155887 XS4U-AA *or Accel injector part number ACC150819.*

l. Intake restrictor must meet FPIR specifications: The QSRE #1975 intake restrictor must be used~~. It must~~ *and may* not be modified in any way. The ~~new~~ restrictor internal diameter is 1.340. ~~This is located in the air box flange.~~ *The restrictor is to be placed between the air scoop mounting flange and the intake manifold.*

m. Engines will be mounted and aligned fore and aft in the chassis

n. The addition of material by any means to any component is prohibited

o. Non-standard rocker covers are permitted providing they in no way improve the performance of the engine.

p. Oil coolers are unrestricted.

q. A liquid cooling system is mandatory, but radiator*s* ~~and water pump~~ are unrestricted. *The stock water pump may be modified; electric water pumps are prohibited.*

r. Fuel pump is unrestricted.

s. Gaskets and seals are unrestricted except for

   1. cylinder head gasket, Ford part number XS7Z6051CA *or Victor Reinz part number 54502*

   2. a continuous o-ring of cross-section of 0.100 inches must be fitted to each intake runner groove between the intake manifold and the head which to ensures that no air by-passes the o-ring seal

t. Pump, fan, and generator drive pulleys are unrestricted.

u. The use of non-standard replacement fasteners (nuts, bolts, screws, studs, and washers) which are not connected with or which do not support

the intake manifold or any moving parts of the engine are permitted.

v. Any *tapered seat 14mm x 25mm (.984 inch) reach* spark plugs may be used.

w. Ford OEM coil P/N 988Z12029A or any other single OEM type replacement coil is allowed.