

May 28, 1965

TO WHOM IT MAY CONCERN:

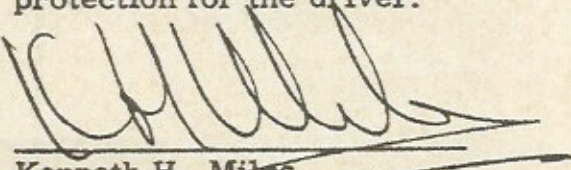
THE COBRA FACTORY INSTALLED ROLL BAR

Shelby American, Inc., by reason of its close association with racing, the experience of its design staff and familiarity with the construction of the Cobra car in both 289 C. I. D. and 427 C. I. D. engined forms is in a unique position to determine the effectiveness of various designs of roll bars suitable for installation in the Cobra.

The factory installed roll bar is designed to offer the maximum protection for the driver by virtue of:

- A. Carefully selected materials.
- B. Careful inspection at all stages of manufacture.
- C. Careful heat treatment.
- D. Selection of chassis attachment points to afford the maximum support for the hoop.
- E. A carefully developed brace, which in the case of the 289 C. I. D. engined car is attached to the main frame tube and in the case of the 427 C. I. D. engined car mounts to both the secondary body tubes and the main frame extension which carries the gas tank, the spare wheel and the rear of the body structure.

Our experience with these installations has shown that even total destruction of the car will not result in serious deformation of the roll bar and we, therefore, call your attention to Page 94, Paragraph I of the General Competition Regulations of Sports Car Club of America, which specifically permits variations from the recommended design of the roll bar provided that the bar is soundly engineered and provides adequate protection for the driver.

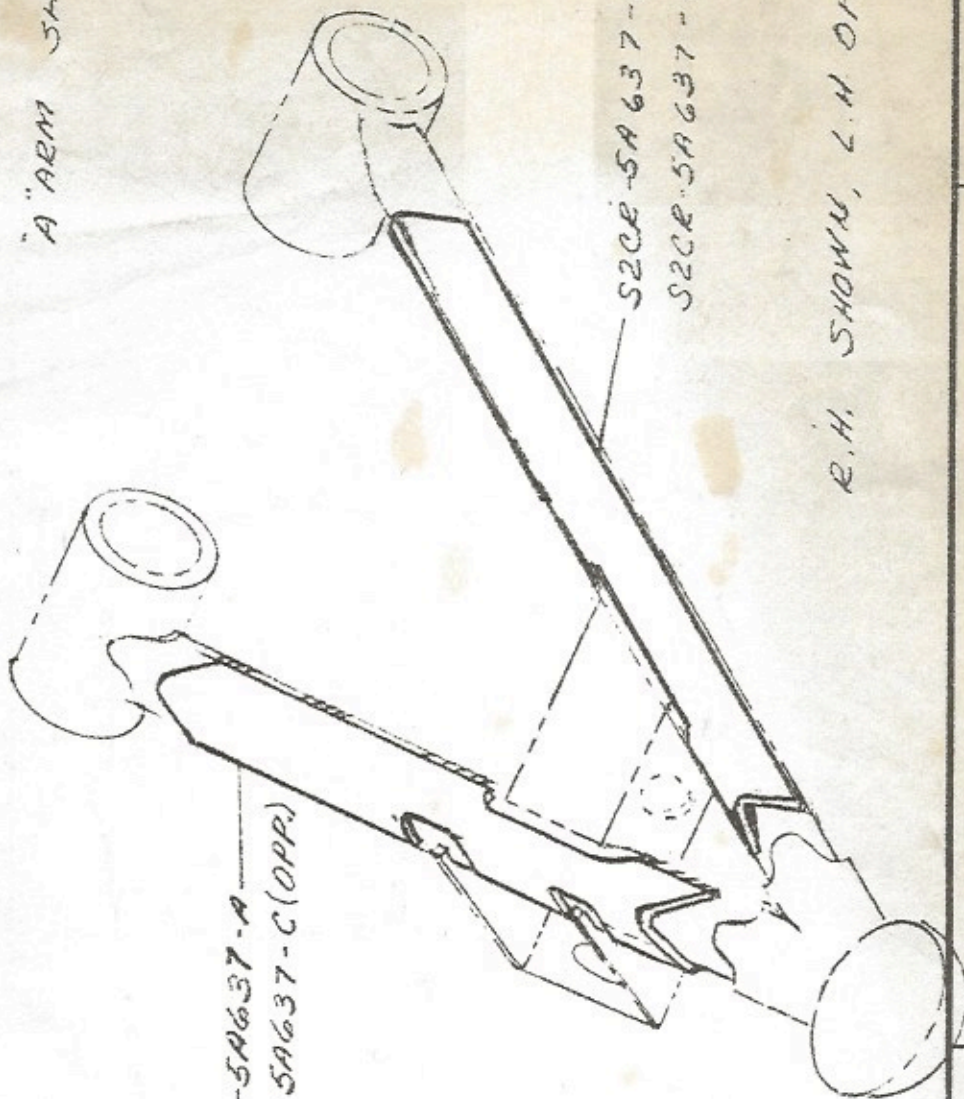


Kenneth H. Mites

KHM:mh

S2CR-5A637


A' ARM SHOWN INVERTED



S2CR-5A637-A  
S2CR-5A637-C (OPR)

S2CR-5A637-B  
S2CR-5A637-D (OPPOSITE)

R.H. SHOWN, L.H. OPPOSITE

DRAFTSMAN JAMES	DATE	5-21-65	
	DESIGNER		
ENGINEER	JENAVIDES	DATE	5-21-65
APPROVED			
SCALE	MODEL COBRA 427		
SHELBY AMERICAN, INC. 6501 WEST IMPERIAL HWY. LOS ANGELES, CALIFORNIA		SHEET 1 OF 1	
		S2CR-5A637	
MODIFICATION, STIFFENER - FRONT LOWER 'A' ARM			

# SUSPENSION:

Additional suspension information on the 427 Cobra Competition from Ken Miles

1. Tires:
  - a. Speedway Specials provide better acceleration and braking but are not as good on cornering. Use 11.90 rears, 9.50 fronts, and set rear camber to 0 degrees to make full use of large surface area. Tire pressures, Hot, 36 front and 30-32 rear.
  - b. Stock Car Specials provide better cornering but are not as good on acceleration and braking. Use 8.20 rears and 6.70 fronts. Tire pressures, Hot, 36 front and 30-32 rear. Set rear suspension at 1/2 degree negative camber.
2. Shocks:
  - a. Front - full soft
  - b. Rear - one turn off full soft
3. Rear Sway Bar: fitting an 11/16" rear sway bar will greatly reduce understeer. This bar is preferred by Ken.
4. Springs: Fitting 10-20% stiffer springs all around will greatly improve stability.
5. Ride Height: Lowering the rear ride height from 5" to 3 1/2" will materially improve handling. This can be done by changing the position of the spring collar. NOT LEGAL FIA, due to ground clearance regulation.

With -  
Here's the bulletins I  
mentioned  
Chuck Cantwell

MEMORANDUM

April 1, 1965

427 SUSPENSION

Suspension on the 427 Cobra should be set up as follows:

- Ride Height - 5 inches to the bottom of the frame tube front and rear.
- Front Toe-in - 1/4 inch total.
- Front Camber - Zero degrees
- Front Caster - 3-1/2 degrees

The toe should be set with the ride height at the 5 inch dimension, the front and rear springs and shock absorber assemblies removed, and the toe then rechecked at each inch of travel from full bump to full rebound. It may be necessary, as a result of the figures obtained, to change the height of the steering rack in order to produce a toe change curve which gives a decrease in toe from normal to full bump of approximately .035 inches, and an increase in toe from normal to full rebound of approximately 5/16 inch.

If the toe change does not fall within these limits then reference should be made to the development charts, which will indicate which way the steering rack should be adjusted.

The rear suspension should be set to 1/8 inch total toe-in and 1/2 degree negative camber. The wheel base should be set as close as possible to 90 inches, equal both sides, but it is much more important that the toe-in of the rear wheels be divided evenly about the two sides of the car. It might be necessary to sacrifice some small wheel base accuracy to accomplish this.

All ride height settings should be made with the weight equivalent to a driver in the driver's seat and approximately 150 pounds weight in the luggage compartment to simulate the weight of a partial fuel load.

May 24, 1965

MEMORANDUM

427 COBRA

COMPETITION VEHICLE

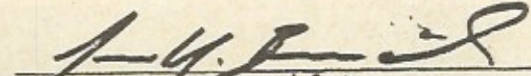
It is recommended that the bearings on the 427 C.I.D. Ford engine be checked prior to each competitive event to insure against wear and thus prevent possible engine failure.

Following is a list of recommended replacement bearings which may be obtained from local Ford Dealers or Shelby American, Inc.

<u>ITEM</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>	<u>UNITS REQUIRED *</u>
1	C1AE-6333-A	Bearing main, upper (Red)	4
1A	C1AE-6333-B	Bearing main, upper (Blue)	4 (Alt.)
2	C4AE-6333-A	Bearing main, lower (Red)	4
2A	C4AE-6333-B	Bearing main, lower (Blue)	4 (Alt.)
3	C4AE-6337-C	Bearing center main, upper (Red)	1
3A	C4AE-6337-D	Bearing center main, upper (Blue)	1 (Alt.)
4	C4AE-6337-T	Bearing center main, lower (Red)	1
4A	C4AE-6337-U	Bearing center main, lower (Blue)	1 (Alt.)
5	C1AE-6211-H	Bearing connecting rod (Red)	16
5A	C1AE-6211-J	Bearing connecting rod (Blue)	16 (Alt.)

Alternate bearing selection may be required if proper clearances are not obtainable with "Red" bearings.

\*Units Required Per Engine.

  
 \_\_\_\_\_  
 James M. Benavides  
 Project Engineer - 427 Cobra

JMB:mn

COMPETITION & DEVELOPMENT DEPARTMENT

APPROVED SPECIFICATIONS

COBRA 427

Manufacturer: Shelby American, Inc.

COMPETITION VERSION

Tread	Front 56 inches	Rear 58 inches
Wheelbase	90 inches	
Overall Length	155 inches	
Overall Height	49 inches	
Overall Width	70.5 inches	
Weight	2,150 pounds	
Construction	Large diameter steel tube frame carrying suspension mounts, body of aluminum panels formed over lightweight steel tube formers	

ENGINE: Ford V-8

Type: Push rod operated, overhead valves, operated from cam-shaft in block

Block: Cast Iron

Cylinder Heads: Aluminum

Bore: 4.24 inches

Stroke: 3.788 inches

Displacement: 427 cubic inches

Crankshaft: Steel forging

Main journal diameter: 2.750 inches

Crank pin diameter: 2.439 inches

Bearings: Copper-lead

Valve size: Inlet 2.085 inch diameter

Exhaust 1.650 diameter

Valve springs: Coil, 2 per valve

Carburetor: Holley four barrel

Ignition: Ford, coil, 12 volt

GEARBOX: Ford

Ratios, Standard: high 1:1; 3rd 1.29:1; 2nd 1.69:1; 1st 2.32:1

Optional: " 1:1; " 1.19:1; " 1.54:1; " 2.32:1

Clutch: Ford, single plate, 11.5 inch diameter

REAR AXLE CENTRE SECTION: Salisbury

Ratio, standard, 3.77:1, optional, 3.09, 3.31, 3.54, 4.09

Limited slip differential standard equipment

SUSPENSION:

Independent front and rear using very large coil spring and hydraulic shock absorber units incorporated in a highly sophisticated design which virtually eliminates brake "dive" and acceleration "squat"

# 4 2 7 C O B R A I I E N G I N E

## LIGHTWEIGHT RACING CONFIGURATION

### SPECIFICATIONS:

#### General Engine

piston displacement	427 cu. in. (7,000 cc)
compression ratio (normal)	10.4:1
brake horsepower	485 @ 6,500 RPM
torque - ft. lbs.	480 @ 3,500 RPM
bore and stroke - in.	4.234 x 3.78
initial ignition timing	6° BTDC
oil pressure - hot @ 2,000 RPM	35 - 65 PSI

#### Cylinder Head

material	Aluminum alloy
intake valve head dia.	2.090 in.
exhaust valve head dia.	1.650 in.
combustion chamber volume	85 - 88 cc

#### Valve Mechanism

valve clearance - int. & exh.	.025 in. hot
valve spring set height	1.80 - 1.82 in.
valve spring pressure	80-90 lb. @ 1.82 in. 255-280 lb. @ 1.32 in.

#### Carburetion

carburetor type	Holley 780 CFM 4V
primary main jets	No. 85
secondary main jets	No. 84
secondary linkage	manual, positive return

### TORQUE LIMITS - FT.- LBS. (OILED THREADS)

Bolt, oil pan	10-12
Bolt, rocker cover	4-7
Bolt, pressure plate	15-20
Bolt, distributor hold-down	5-8
Bolt-cross, main bearing cap	38-42
Bolt, intake manifold	22-25
Bolt, exhaust headers	20-23
Bolt, connecting rod	58-60
Bolt, cam sprocket to cam	35-45
Bolt, cam thrust plate to block	12-15
Screw, rocker arm adjusting	7-15
Bolt, flywheel to crankshaft	75-85
Bolt, main bearing cap	95-105
Plug, oil pan drain	15-20
Bolt, damper to crankshaft	70-90
Bolt, rocker shaft hold-down	45-50
Plug, spark (dry threads)	15-25

BRAKES: Girling disc  
Front disc diameter 11-5/8 inches  
Rear disc diameter 10-3/4 inches — //, 330"

WHEELS: 7.50 x 15 front, 9.50 x 15 rear, alloy

CAPACITIES:

Radiator 20 quarts  
Engine oil 13 quarts wet sump - 14 quarts dry sump  
Fuel tank 42 gallons

Sway bars front and rear, special tuned exhaust system, roll over protection, seat belts, rear axle oil cooler and pump, engine oil cooler, all standard equipment on competition model.

OPTIONAL EQUIPMENT:

Special racing bucket seat; shoulder harness; quick change brake pad kit; mechanical chronometric tachometer; dry sump kit



Page Two  
Lightweight Racing Configuration

GENERAL NOTES

427 Cobra racing engines are carefully assembled and dynamometer tested before installation in the chassis, and track tested and tuned for maximum performance at the test track. The engine is fully broken in and ready to race, but due to variations in altitude and atmospheric conditions from the test track it will be necessary to re-tune engine for best performance at each race location. A wide range of carburetor jets and spark plugs are available for that purpose.

427 C.I. and L.W. Racing Engine Specifications

(C.I. - Cast Iron, L.W. - Lightweight)

## Connecting Rods:

Connecting rod vertical clearance .0015-.002  
 (.0018 desired)  
 Rod side clearance (2 rods) .014-.024  
 Refer also to main bearing color chart.

Bearing bore - Red  
 Blue  
 Crankpins - Red 2.4384-2.4388  
 Blue 2.4380-2.4384

## Valves:

Valve seat runout .0015 T.I.R.  
 Valve seat width .09-.07 exhaust  
 .08-.06 intake  
 Valve spring set height 1.80-1.82  
 Valve load 80-90 lb. @ 1.82 in.  
 255-280 lb. @ 1.32 in.

## Camshaft:

End play .006-.008  
 Inside diameter ( with bearings) 2.1258-2.1268  
 Taper (bearing) .0002 maximum  
 Taper (journal) .0002 maximum  
 Out of round (journal) .0006 maximum  
 Clearance .001-.003

## Distributor:

Gear backlash .002-.007  
 Shaft end play (assembled) in engine .004-.020

Intake manifold - Material \_\_\_\_\_ P/N \_\_\_\_\_

## Carburetor: (Holley 780 CFM)

Jets (nominal) - secondary - .101 - (#85)  
 primary - .089 - (#78)

SHELBY AMERICAN, INC.

427 C.I. and L.W. Racing Engine Specifications

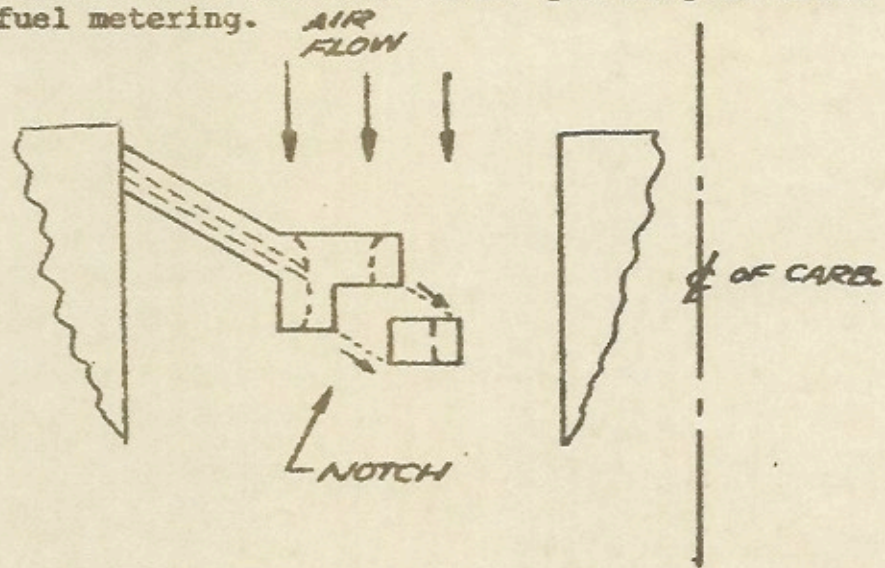
(C.I. - Cast Iron, L.W. - Lightweight)

Modification -

Block off power valve with a 1/2 inch I.D. x 3/32 thick "O-Ring"

Change jets to - .101 - (#85)  
Secondary - - .98 - (#84)

"Notch" the nozzle bars (venturi tubes) per diagram below for better fuel metering.



Remarks and/or other specifications: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

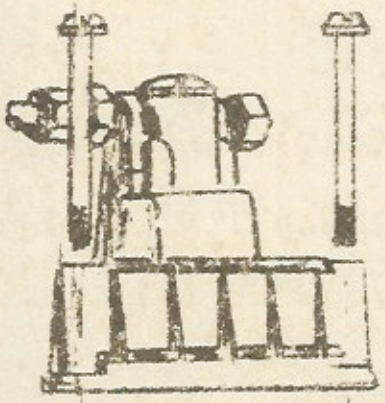
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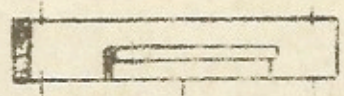
BLOCKING POWER VALVE  
780 CFM CARBURETOR

9A507 Float Bowl

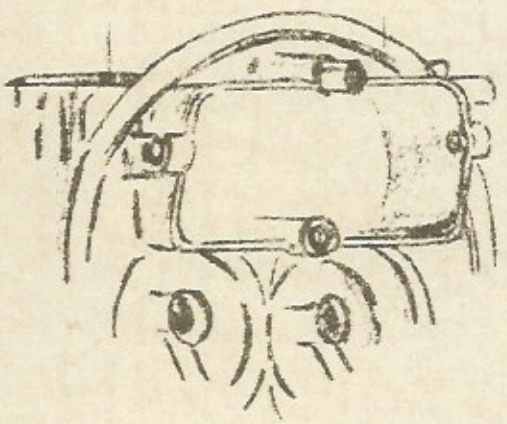


359747-S Stud

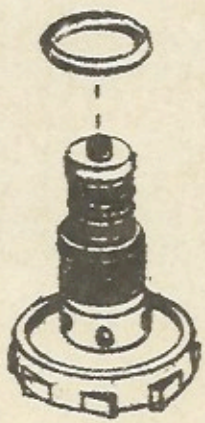
9A511 Cover Plate



9512 Base



Parker 2-112 O-Ring  
(.487 I.D. x .103 W)



9A565 Power Valve