

shankle automotive engineering

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SHANKLETTER II

May 5, 1975

GENERAL

Thank You

We would like to thank everyone for your favorable response to our first newsletter. We were pleased with it and plan to expand it as time goes by. We hope that you find it useful and informative, because that is the real purpose of the newsletter. It's for you.

'75 Season

We continue to be deeply involved in Formula Ford and would like to let you know how and where. Our field testing program involves the same driver/mechanic team as last year -- Chuck Pittenger and Klaus Holthaus. They are campaigning a new Mk. 21 F LeGrand Formula Ford, with a sleek new body, on the West Coast and have an eye on Atlanta. The Pittenger/Holthaus program is our "field dyno," as it were and that is where we find out if everything we do works where it counts -- on the track. Their most recent race was in Phoenix for the National Points race there on April 27. Starting fourth on the grid, Chuck took the lead on the first lap and won the race by more than ten seconds. On April 13, at the Willow Springs National, Chuck qualified fourth, took the lead on the second lap and was never challenged. Stretching his lead to six seconds at one point, his final margin of victory was about two and one-half seconds. On March 30, they raced in Las Vegas, where a professional race was held by the newly-formed Formula Ford Racing Association. In that race, Chuck qualified fastest, won his heat race, started from the pole position and led the main event from start to finish. Chuck has won every professional Formula Ford race ever held on this track and this win makes four in a row. This was preceded by a third place finish at the opening S.C.C.A. National Points race at Riverside in February and a second place at Holtville earlier in March. We are pleased with our "field dyno."

~~Swanson Motor Racing has fielded a new Lola T 342 Formula Ford for USAC driver Mike Hiss to run in National Points races this year. The Swanson/Hiss team has opted for Shankle Power in their cars. New Cars from both LeGrand and Swanson are available with various stages of Shankle Power.~~

Up North, Pierre Phillips has brought over a Lola Formula Super Ford, which he personally will drive in the combined Formula A,B,C, and Super Vee races in his area. We are preparing a 2000cc Pinto engine for this project and expect that it will produce some interesting results.

On the 6th of April, the National Points Race at Sears Point was won by Tom Weichmann in an ADF using a Slatten/Cortina engine. The cylinder heads on the Slatten Cortina motors are Shankle prepared units and certainly seem to be doing the job for them.

Mailing List and Correspondence

Our mailing list has grown to quite some size since the introduction of the catalog. It takes a good deal of attention to keep it up to date, so we ask again that you help us all you can in that respect. If you have received this newsletter, then surely you are on it. If you are on the list but do not have a catalog, then you may be missing some important data, since the catalog is the subject to which we address ourselves and make changes in these newsletters. Our catalog is expensive to produce and the best way to get one is send us two dollars. If you have a friend who wants one, tell him how he can get one of his own. He may have yours just when you really need it.

If you have any questions that you would like to see answered in future newsletters, please send them in. We will answer all correspondence individually by mail as soon as possible, and any frequently-asked questions will be answered in a subsequent newsletter. Either way you get your own questions answered, so let us hear from you.

PARTS INFORMATION

Added Part Numbers

A good portion of you are working with the first edition of the catalog. Part of the purpose of these newsletters is to keep you up to date so that it is not necessary for you to buy a new catalog. Below, you will find a list of the parts that have been added in the second edition, along with a brief description.

1.033	clutch attaching bolt
1.038	distributor cam assembly
1.038.a	distributor wire
1.055.d	water pump attaching bolt 1/4 x 20 UNC x 1-1/4
1.058.b	cylinder head locating dowel . . . Uprated
1.092	starter end plate with through holes
1.093	starter end plate with threaded holes
1.164	replacement spring set for Filtron Filter
1.166	tach cable end with clip
1.174	Champion Spark plug . . . N-57-G
1.175	Champion Spark plug . . . N-59-G
1.176	Champion Spark plug . . . N-2G
1.177	Champion Spark plug . . . N-3-G
1.202	Repco Brake pad suitable for Lola
1.215	prepared complete cylinder head . . . Cortina
1.216	prepared complete cylinder head . . . Uprated
1.219	prepared intake manifold . . . Cortina
1.220	prepared intake manifold . . . Uprated

Notes

Complete gasket sets are now being supplied with pan sets, although they are the late rubber seal type. If you need the cork seal type, then continue to order your pan set separately.

Recently, a customer called and pointed out that the valve springs in the catalog could be mistaken for stock units. Order Numbers 1.108 and 1.109 are Shankle springs and not stock. Details of their proper use can be found in the TECH NOTES section of this newsletter.

Our order number 1.137 is now a special set of rings for the uprated engine that we make up especially for FF Application. The description as found in the second edition is as follows. "We have selected and assembled the optimum combination of compression and oil control rings to give the best compression sealing, low drag and superior oil control. Top ring is 1/16th" moly, with .005" extra material for end gap adjustment. Second ring is cast iron with low tension for reduced drag. The oil control ring is a three piece unit with two chrome-faced rails and circumferential spring expander-spacer."

Prices

We have enclosed a revised price sheet with this mailing. Please discard the price sheet dated November 30, 1974. We would like to call your attention to our prices on Uprated engine parts. We have been able to improve our supply system for these parts and this has resulted in better prices and over-all supply. Some items remain harder to stock than others, but we should be able to cover your needs in most all circumstances.

Posters?

When we first published the catalog, we considered producing poster-size reproductions of some of the illustrations. We have not done that as yet. We would like to know from you whether or not you would find them useful for assembly purposes. They would have to be sold for one or two dollars each. If you think that it's a good idea, please let us know and at the same time, tell us which illustrations you would like to have available.

Orders, Shipping and Back Orders

We normally ship parts orders three days each week. We ship every Friday, so that nothing is ready to go out sits in the shop over the weekend. The other two days vary from week to week, but your order is never more than a day or so from the door. We will always "ship what we have," and back order any item on your order that may be out of stock. We fill all of our back orders as soon as possible and have good control over them. If you wish to have a particular item stock-checked we will do it at the time of your order. If you do not request a stock check, we will let you know of those items that we may be sure are going to be back ordered so that you do not expect them with the arrival of the other items on your order. If we don't have something there is usually a good chance that we can tell you when you can expect to receive it.

Hours

We would like to initiate ordering hours. Please phone your orders in between 10:00 A.M. and 6:00 P.M., Pacific Time, and similarly with technical questions. If you have need of a part that must be shipped the same day that you call, we must receive the order before Noon that day to guarantee same-day shipment.

Parts Special Offer

Hylomar . . . 4 oz. tube	\$ 5.00
1.031 clutch disc	\$19.90
1.032 pressure plate	\$28.50
1.055 water pump	\$16.00

.PRODUCT IMPROVEMENTS

New Cortina Sucker

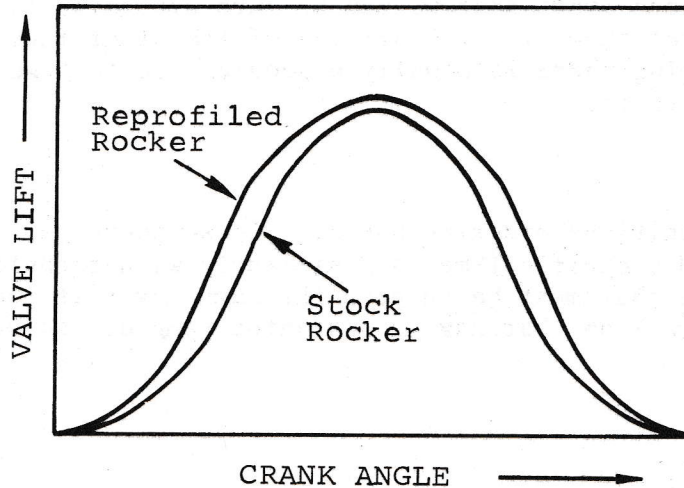
We have recently introduced a new air intake for the original Cortina engine. This new unit is similar to the Super Sucker for the Uprated engine, and performs better than the original design. It does have what may appear to be a mismatch with the top of the carburetor. When installed, the air horn base does not conform to the outline of the air inlet at the top of the carburetor lid. This is intentional.

The reason we have gone to this design is that the Super Sucker configuration gave a greater increase on the Uprated engine than did the original Sucker on the Cortina engine. However, the carburetor top of the 32/36 DGV is larger than that of the 32 DFM, and we could not extend the air horn tubes into the top of the DFM as we do on the DGV. Recognizing this, we did the next best thing and made the opening at the base of the air horn about the same area as the air horn tube. It works . . . mismatch and all.

TECH NOTES

Reprofiled Rocker Arms

The profile that we grind on our rocker arms is designed to give the maximum lift as specified in the GCR. Additionally, the contact patch is made narrower so as to achieve a greater rocker arm ratio at intermediate valve lifts. This yields more area under the valve lift curve and increases the intake and exhaust breathing capacity. (See illustration) The increased power output realized by using our profiled rocker arms is due primarily to this increase in valve openings at intermediate cam lifts and not so much the attaining of maximum lift allowed.



When the contact patch is made narrower, the potential for wear is increased, due to the sharper point of contact. One factor which contributes to rocker arm, valve guide, tappet and camshaft wear is excessive valve spring tension. There are a number of different valve springs currently available. Our springs give a seat load of about 75 pounds and a wide open load of about 145 pounds. We have seen many springs that have loads from 180 to 200 pounds at maximum lift. This is considerably greater than is required for the rather mild, low lift Cortina GT camshaft. Recently, Chuck Pittenger and Klaus Holthaus inadvertently selected the wrong gear ratios at the Holtville National Points race. (Chuck finished second in the new LeGrand.) This resulted in the engine turning 7000 rpm down the straight on every lap. While the engine is well off the power peak at this rpm, there was no valve float, nor was there any indication of wear or valve train problems when the engine was torn down for overhaul. This engine is now in its second season of competition.

Valve Springs-Installed Height

The installed height of our valve springs (orange) is 1.20-1.22 inches. On a new cylinder head, this is achieved with our bottom spring retainer. However, when the head has had a few valve jobs, and the valves are worn, shims must be added to get the proper installed height and proper valve spring loads.

Air Filters

We cannot emphasize enough, the benefits of the air filter, especially after the Holtville race. During qualifying on Saturday, the wind came up with a lot of sand in the air. On engines without the air filter, the wear on pistons, rings, valve seats and valve guides was excessive. Some engines had no compression after practice. Those who had spare engines ran them on Sunday. Others tried to rebuild them Saturday night. The Pittenger crew, and others who had them, cleaned the air filter and went to bed. After Holtville, the engine was torn down for overhaul with three races on it and was perfect inside. Bore wear was not measurable. Normally, we would only do a valve job on the engine with this amount of time on it, but the over revving mentioned earlier necessitated changing the bearings. It is interesting to note here that Cosworth Engineering has specifically stated that the same Filtron air filter is the only one acceptable for use on their BDA series of racing engines.

Maintenance

We are often asked about a maintenance schedule for the Formula Ford engines. This is difficult to prescribe because of many variables which include: 1) the drivers ability to maintain a reasonable red line (6000-6200 through the gears and 6500 maximum in top gear for the Uprated engine); 2) proper cooling and no overheating; 3) constant oil pressure; 4) the amount of dirt, etc. taken into the engine. With the air filter and all the other factors under control, we would recommend a valve job every three races and new bearings and rings every six races to maintain the engine in top shape. We have customers who have gone a whole season without touching the engine but power will be down. The very serious competitor may wish to check the valves after every race by cleaning and lap checking for sealing, and do a valve job as necessary. This will also include checking the bearings and inspecting the cylinder bores for wear and reringing whenever necessary.

Revised Tune-Up Data

Please find enclosed a revised copy of the tune up data that appears in the back of the catalog. This is the data with which we are currently working.

TIGHTENING TORQUES

ITEM	SIZE	TORQUE lb-ft
Main Bearing Cap Bolts	7/16 x 14 UNC	70
Connecting Rod Bolts	3/8 x 24 UNF	35
Rear Oil Seal Cover	5/16 x 18 UNC	15
Camshaft Thrust Plate Bolts	1/4 x 20 UNC	3.5
Timing Chain Tensioner to Block	1/4 x 20 UNF	7
Camshaft Sprocket Bolts	5/16 x 18 UNC	15
Timing Chain Cover Bolts	1/4 x 20 UNC	7
Crankshaft Pulley Bolt	7/16 x 20 UNF	28
Flywheel Bolts	3/8 x 24 UNF	55
Cylinder Head Bolts	7/16 x 14 UNC	70
Rocker Shaft Bolts	3/8 x 16 UNC	30
Valve Cover Screws	1/4 x 20 UNC	3.5
Oil Pan Bolts	1/4 x 20 UNC	8
Oil Pump Bolts	5/16 x 18 UNC	15
Intake Manifold Bolts	5/16 x 18 UNC	15
Intake Manifold Nuts	5/16 x 24 UNF	15
Clutch Plate Bolts	5/16 x 18 UNC	15
Engine Mount Bolts	5/16 x 18 UNC	18
Exhaust Manifold Bolts	5/16 x 18 UNC	18
Exhaust Manifold Nuts	5/16 x 24 UNF	18

TUNE UP DATA

Firing Order: 1 - 2 - 4 - 3		
Maximum Ignition Advance		
4000 RPM to maximum RPM		
Cortina		37° - 38° BTDC
Uprated		38° - 39° BTDC
Distributor Point Gap		0.020" - 0.022"
Spark Plugs		
Cortina		N-63-Y Champion
Uprated		N-64-Y Champion
Spark Plug Gap		0.025"
Cam Timing		
Inlet valve fully open		114 - 115° ATDC
Exhaust valve fully open		104 - 103° BBDC
Valve Clearance		
Intake		0.010" - 0.011"
Exhaust		0.020" - 0.021"
Carburation (@ 94% Air Density)		
Cortina	Primary	Secondary
Fuel jet	1.50	1.40
Fuel jet w/SAE Sucker	1.55	1.45
Air corr. jet	1.40	1.40
Emulsion Tube	F-6	F-6
Uprated *		
Fuel jet	1.40	1.55
Air corr. jet	1.65	1.60
Emulsion tube	F-6	F-6
Oil Pressure (At Speed)		
Minimum		45 psi
Maximum		70 psi

* With anti-surge tube in conjunction with Power Enrichment circuit - economizer valve removed.