

BASIC SUGGESTIONS FOR INCREASING THE POWER OF THE STUDEBAKER CHAMPION ENGINE

Consider first the general condition of your engine, which should be in good order to take full advantage of the added power developed by the equipment you will install, because the percentage increase in power you will obtain is based on the actual present horsepower output of your engine. No equipment will make up for leaky valves, poor rings, or leaky ignition wiring.

Timing should be set so a *faint* ping is barely audible in high gear at open throttle between 25 and 30 mph when engine is thoroughly warmed up. No undue play should be in the distributor shaft bearings. Automatic spark advance should be free and correct. If you can have your distributor checked in a late type distributor tester by a competent operator, so much the better. Have him check the coil, condenser, point clearance and line-up. See that your battery ground strap runs from the battery to the engine, not to the frame. There should be also a strap running from ~~the engine across an engine mounting to the frame. Use a good detergent type lubricating oil SAE 30 for road use and SAE 40 for race use. Warm up engine carefully before expecting it to work for you. Oil pressure using SAE 30 oil should be 40 lbs. at about 40 mph with engine oil hot or bearing clearances may be excessive.~~

1. The first step is to install a good high compression head of 8.5 - 1 which has combustion chambers so designed as to allow the use of a good regular fuel instead of premium fuel without knocking. Then, if regular fuels are graded down for any reason, you can use the premium fuels and will not be forced to remove your high compression head or set back timing too far.
2. The second step in actually increasing power is to install a dual intake manifold and dual carburetors to insure that the flow of air-fuel mixture into the cylinders will be accomplished evenly and rapidly.
3. Then install a special camshaft ground for your engine and use.
4. Then port the block, oversize the intake valves, and put in special valve springs.
5. Then bore out to 3-1/8", relieve block between the cylinder bore and the valves, and install special light weight racing pistons with race type rings. If your engine is a 1939 or 1940 you can put in a later crankshaft with the 4" stroke to increase the total displacement to 184" after boring to 3-1/8". This will really give you a power job. 1955 and later 4-3/8" crank cannot be installed in 1954 or earlier blocks.
6. If for a race car or hydroplane the last touch would be to increase compression and burn alcohol.

There is naturally some diverse opinion as to the order of importance in the different steps shown above. It is certain that you will not go wrong in following those enumerated above unless you have some particular reason to do otherwise. Your needs, financial condition, and mechanical ability will certainly have some effect upon the order in which you might want to go about obtaining the results desired.

For instance, if you are facing an engine overhaul, it would be very advisable to bore out to 3-1/8" instead of some lesser oversize, in order to obtain the great benefit from the increased displacement. By so doing, you will have less reciprocating strain on the bearings and rods with our special 3-1/8" pistons, pins and rings than with ordinary oversize pistons which always have heavier walls and greater weights. There is ample metal thickness after boring to 3-1/8" to insure long life and proper cooling. The use of oversize intake valves at this point is a very good improvement.

Please feel free to write at any time for further information or special help pertaining to the use of our engine improvement parts and equipment.

QUESTIONS AND ANSWERS

- Q. *What horsepower increases should I get if I follow the steps outlined on the reverse of this page?*
- A. 1954 and earlier engines develop: 85 hp : 1955 and later engines develop : 101 hp
Add step No. 1 to obtain: 95 hp : Add step No. 1 to obtain: 112 hp
Add step No. 2: 105 hp : Add step No. 2: 125 hp
Add No. 3: 115 hp : Add No. 3: 137 hp
Add No. 4: 123 hp : Add No. 4: 146 hp
Add No. 5: 132 hp : Add No. 5: 157 hp
With alcohol and triple carbs: 175 hp : With alcohol and triple carbs: 194 hp
Steps 1 and 4 and 3-1/8" pistons: 107 hp : Steps 1 and 4 and 3-1/8" pistons: 127 hp
Steps 1, 2, 4 and 3-1/8" pistons: 117 hp : Steps 1, 2, 4 and 3-1/8" pistons: 139 hp
- Q. *Will the Champion engine successfully replace the MG engine?*
- A. Yes indeed. With just a mild hop-up (Steps 1 and 2) you can equal the stock Jag; be somewhat better than the TR-2, and be much better than the Healy in acceleration. Handling is also improved.
- Q. *What happens to my heated intake manifold when I install yours?*
- A. Our dual intake manifold fits so closely to the exhaust part of the manifold that it obtains plenty of heat for flexibility in coldest weather.
- Q. *If I don't buy your special carburetors, can I use my present one and another like it?*
- A. Certainly. See the TERRIFIC DEAL on first page of parts list.
- Q. *Can I put a 1955 Champion engine in my older Champion car?*
- A. Yes, but at considerable extra cost, as the following parts must be replaced with 1955 Champion parts: Engine block assembly, rear engine plate, flywheel, cylinder head, oil pan, clutch cover assembly, clutch driven plate, engine front mounts and brackets, muffler, tail pipe.
- Q. *Will a special ignition save enough gas to pay for the installation?*
- A. It takes a hotter spark to fire lean mixtures, or to fire normal mixtures at high speeds. While you may not travel enough miles to pay for the Magspark set-up quickly, it will increase your overall efficiency and aid in cold starting.
- Q. *Can I bore out to 3-1/8" without changing anything else and obtain good results?*
- A. Yes, but using oversize intake valves helps your engine breathe better, and increases the torque more.
- Q. *Doesn't the boring out to 3-1/8" leave the walls too thin, and cause heating?*
- A. No. We have bored many, many blocks to 3-1/8" and have sold hundreds of sets of our special 3-1/8" pistons without having one single case of heating. Studebaker has ample wall thickness in all their engines.
- Q. *In one place you mention Super Full Race equipment and in another place you state your Super Full Race engines don't jerk or buck. Why?*
- A. In planning the design of a special engine, we take into consideration what use it will have. If you want nothing but top speed, it will not handle too well at low speed. If you want acceleration through gears, you may lose flexibility. If you want it flexibly able to handle all traffic conditions, then we engineer it for that, at the loss of some top speed, also. The thing which determines how an engine will handle is how it is engineered. You tell us what you want out of your engine, and we will see that you get it, whether we build it up, or just furnish the parts and instructions.
- Q. *Is there more to a cam grind than just speeding up the timing?*
- A. Yes, indeed. There are many cam grinds which do not get much in the way of new power because they are not ground for that engine and for that use. Tell us what you want from your engine and we will help you. See special cam sheet on back of next page.

TUNE-UP TIPS AND OPERATING HELPS FOR YOUR STUDEBAKER CHAMPION

Periodically wipe accumulations of dust and dirt from the porcelains of your spark plugs, especially at the season's first fog or rain. Practically all cars which will not start in damp weather will start if the porcelains are wiped clean and dry with a soft cloth, and if the throttle is opened wide and held steady while being started, in order to overcome the flooding which always results from trying to start a cold engine under such conditions. The high tension current will travel across the dirty porcelain surfaces in preference to jumping the air gap between the electrodes of the spark plug in the cylinder, as the high compression resists the flow of electricity across the gap.

If your engine dies at stop signs, listen to the speed of the engine at idle. If it sounds too slow, turn the idle adjustment screw on the *throttle shaft* to increase the engine speed a little. A few added revolutions per minute will do wonders in steadying the engine at idle speed.

If your engine rolls and loads up on idle, or dies easily at correct engine idle speed, carefully adjust the idle mixture screw on the *body* of the carburetor. Turning it one way or the other slightly will either improve or worsen the idle. Before you start to adjust, mark the position of the slot in the idle screw head in relation to the body of the carburetor in case you "get over your head" and want to call it quits at the original setting. The use of a vacuum guage will enable you to set the idle air-fuel mixture at the correct point, and will tell you a great deal about your engine condition. It is very important to own this tune-up necessity.

If your car is equipped with dual carburetors, follow the supplier's directions to adjust them, and get them perfectly synchronized.

If your engine remains rough after adjusting the carburetor, the ignition should be checked over carefully, and full precaution against faulty wiring, plugs, coil, condensor, and distributor should be taken. Then, if engine still operates roughly the valves may be in need of adjustment or servicing. At this point a compression testing guage is very necessary, and will give you a close indication as to whether the valves are at fault or the rings worn out.

If your engine heats up it will pay to carefully check the following:

Be sure the radiator is free of bugs so the air can get through the core. Check for leaks at hoses, in core, in upper and lower tanks, in water pump, freeze plugs in block, and drain cocks. Check slippage of fan belt, and be sure fan has proper pitch to blades, and that all belt pulleys are tight to their shafts and that fan blades are tight to their pulley. Fill radiator clear full, even up into the neck. Then open throttle quickly and rev engine up fast and then close the throttle to idle. If water runs out over the top of the neck, check the lower radiator hose for collapsing at high speed. If the lower hose is all right, then check for impeded flow of water through the core. If that is all right, refill radiator clear full to the top of the neck and run engine at a fast idle. If air bubbles are seen to be rising through the water the pump may be drawing in air which will replace the water in the cooling system. If not, set the brakes and block the wheels, be sure the radiator is full to the top of the neck, put in high gear, and by slipping the clutch or regulating the throttle if an automatic transmission to pull down the engine and make it work hard, you may discover water being forced out of the radiator neck and vapor rising through the water, in which case, the cylinder head gasket may be blown, the head cracked or the block cracked or containing a sand hole in the casting which allows the products of combustion to get into the cooling system, super-heat the water, displace the water, and cause serious overheating. A radiator pressure cap is the best insurance that water will not lose out thru the overflow each time you stop after a hard, hot weather run if your cooling system is otherwise in good condition.

These Three Special Cam Grinds Are the Result of 16 Years of Constant Testing and Comparing in Champion Engines.

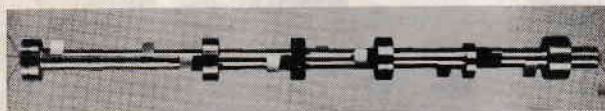
WE GUARANTEE TO FURNISH YOU THE BEST GRIND
FOR YOUR PARTICULAR ENGINE AND USE!

When comparing cam grinds it is impossible to compare degrees of duration, as grinders obtain their degree specifications in various ways. Neither can valve lifts be compared because the period of dwell designed into the cam has a great deal to do with the flow past the valves and may replace some lift. Our cams require no degreasing-in, as they are ground to work exactly right when installed to factory timing gear marks and with clearances set as indicated on specification tag accompanying each cam.



Our BN-1750 grind has been developed over the years as an important improvement of the stock cam without sacrificing good idle and low speed performance. Cam lobes are changed in profile to load cylinders more fully, to improve torque and horsepower, and

to maintain the good gas mileage already evident in the Champion engine. As is true of all our cam grinds, lifting and seating ramps are designed for quicker opening and closing for improved flow past valves, yet the closing ramp sets the valves on their seats gently for longer valve life. Action is excellent with stock valve springs, yet improves with our matched, plated springs. We recommend this cam for all Champion engines which will be used on the road and in traffic.



This BN-2100 grind is the logical out growth from our BN-1750 grind above, and carries a .015" higher lift. Duration is 256°. This cam will idle even with single carburetor, but gets most power with duals or triples when engine improvements have been

carefully made with better breathing in mind. It will be at its best with the help of our 3-1/8" special pistons, our oversize intake valves, special matched and plated valve springs, and 8.5 - 1 aluminum alloy cylinder head. When used in race applications, we advise advancing the valve timing by our special method which we send with this cam upon request. A full race engine with this cam will develop 132 hp on gasoline and 175 hp on alcohol, with 4" stroke. With 4-3/8" stroke, 146 hp and 194 hp respectively.



Our BN-2350 is a 270° grind with reduced valve lift for use on straight-away time trials or hydroplanes... and for no other application. The lower valve lift is made up for by increasing the period of dwell of the cam so that extremely high rpm may be obtained with

the least shock on valve train, and no float at 7000 rpm with our special matched and plated valve springs, and with lightened valves. Only a completely improved engine will carry this cam, and all engine work must be done with high speed in mind. Because in hydroplane applications the horsepower requirements are reduced after the hull planes, we can use high rpm at lessened hp and still increase our speed. This grind is based on this peculiar power application.

We have NINE additional grinds for the Champion, none of which will come up to the three cams listed above. Each cam above is tops in its own application and is guaranteed by us to be the very best!

**WE HAVE THE WORLD'S FINEST PRECISION CAMS DEVELOPED EXCLUSIVELY
FOR THE STUDEBAKER CHAMPION ENGINE.**

PARTS FOR
CUSTOM WORK ON STUDEBAKER
CHAMPION ENGINES

EFFECTIVE DECEMBER 31, 1954
SUBJECT TO CHANGE WITHOUT NOTICE.

DUAL INTAKE MANIFOLD, Morgan designed. Highly polished aluminum alloy, log type. Will handle wet or dry mixtures, either gasoline or alcohol, and give best distribution of air-fuel mixture to each cylinder, providing the utmost power. With this manifold the carburetors do not have to be set rich to avoid pinging, as there are no lean, starved cylinders. Ours is the only *log type* manifold for the Studebaker Champion on the market, and as such has many important advantages over other type manifolds, such as: Fast warm up, even distribution, maximum power without running carburetors rich, excellent cruising gas mileage, instant power response, compact design, carburetors carried low. Will accommodate full size race type air cleaners, fits all Champions 1939 to present, including those with low-type hoods. This manifold is the only one having fully built-in linkage which stays in adjustment and which is self-compensating for wear. There are no linkage or synchronizing troubles with this completely engineered manifold. We provide full instructions not only for the proper installation of this manifold, but also for the easy converting of your old exhaust manifold for use under the **MORGAN** dual intake manifold. Also included are full instructions for setting up and synchronizing the dual carburetors, together with an ingenious gauge for synchronizing the carburetors easily. With our instructions you will become an expert in dual carburetor synchronization and can apply your knowledge to such installations on other make engines also. Our dual intake manifold is fully polished, made of virgin aluminum alloy, heat treated and machined, and comes with gaskets, chromed acorn nuts, and complete dual carburetor linkage *built in*. Inner passages are extra smooth for full flow. No. CM-1, 7 lbs. \$37.50.

TERRIFIC DEAL! We will furnish our CM-1 manifold described above, complete with our sturdy *built in* linkage and all items and instructions mentioned above...and in addition, a new carburetor to match your present one, at the low price mentioned below! Give numbers from brass tag on present carburetor. Only one such kit to a customer. Value \$65.00. Order Kit CM-1AK. 14 lbs. Only \$56.39.

CYLINDER HEAD, high strength, heat treated, high compression, aluminum alloy. Available in 8.5-1 compression ratio for 1939-1954 Champions, and in 8.95 - 1 compression ratio for 1955 and later Champion 6 engines, to operate on good grades of regular gas, or Ethyl. Increases torque and horsepower throughout the range 500 rpm on up. Saves gas. Only virgin alloys are used, so lifetime guarantee is given against any cracking of the head. Machining is precise, and beautifully done. Exterior fins are brilliantly polished. Interior fins increase cooling ability and add strength throughout. Combustion chambers are carefully formed to take harshness from combustion and to maintain adequate quench area to provide ping-free operation on regular grades of gasoline. Because aluminum conducts heat faster, and because of combustion chamber design, you can set spark ahead more and obtain more power than with other high compression heads. For this and other reasons the use of our high compression head is much more economical in the long run than having your iron head milled. With proper combustion chambers high compression allows less pounding of bearings than does lower compression, because of the cushioning effect on compression. All accessories and connections now in use with stock head are accommodated by our special head. Comes with attractive, etched **MORGAN** name plate and full instructions, including torque specifications. Suggest use of our washers and head gasket for ease and security of installation. Order No. CH-12 15 lbs. \$48.95, for head alone. For head kit with washers and head and water outlet gaskets, order No. CH-12A, 17 lbs. \$51.50 complete head kit.

HEAD WASHER SET, plated steel. Keeps head screws from galling aluminum when tightening down cylinder head. With washers, proper torque readings are obtained easily. Order No. CH-15 1 lb. 95 cents for the set of 20 washers.

WATER OUTLET, satin finished, cadmium plated to match aluminum head. CH-16 2 lbs. \$2.95.

HEAD BOLT COVERS, chrome. Set of 22 to set off aluminum head. CH-14 1 lb. \$2.65.

HEAD GASKET, treated steel-bestos for high compression. CH-12B 2 lbs. \$1.56.

EXHAUST MANIFOLD, modified stock. To fit under dual exhaust manifold CM-1 if you don't want to alter your own with our easy-to-do instructions. This is not a split manifold but the exhaust manifold from which the stock intake manifold has been removed. All fitting and welding has been done, and it is ready to use. CX-3 15 lbs. \$16.55.

DUAL CARBURETORS, Morgan modified. These new Zenith carburetors are re-worked to give perfect performance, and are synchronized and tested before shipping. When you order with our dual manifold CM-1 we set them up on manifold ready to go. Dual carbs come complete with choke wire, dual aircraft type gas lines with sintered-bronze gas filter. (NOTE: These carburetors are set up for our own log type dual intake manifold and will not work on other make manifolds without richening their mixture. When bought for installation on other make manifolds we will not guarantee, nor accept return on any basis.) We guarantee our carbs to be tops when bought for our own dual intake manifold, as even distribution to all cylinders is thus assured. Give full particulars of use of engine, and elevation of area you drive in mostly so we can adjust them fully for your needs. Order No. CC-7 10 lbs. \$67.60.

AIR CLEANERS, chromed race type, with coppered mesh. Protect your engine with the best; don't depend on window screen to keep out abrasive dust. Order No. CC-9 3 lbs. \$9.50. Pr.

LOW AIR CLEANERS, chromed race type, for 1953 and later. Protect your engine with the best. Don't depend on screen to keep out abrasive dust. Order No. CC-10 3 lbs. \$12.50. Pr.

DUAL GAS LINES, aircraft type, flexible, with sintered-bronze filter and all fittings for quick installation. The finest. Can not crack from vibration. CC-11 1 lbs. \$4.95.

MUFFLER, modified stock, to give it a one pass system, yet maintain full expansion benefits. Nice, clear, smooth, mellow tone. Legal. This is the muffler all our tests are made with. Order No. CX-5 10 lbs. \$10.50.

NOTE: Complete instructions are given with all items we sell which might present an installation problem for the inexperienced. For instance: For cylinder heads, the proper tightening sequence is given in a diagram, together with proper torquing specs. The little hints which insure a fine job are always included. The following items are best installed with the help of an experienced man unless you have our complete engine instruction book, have the necessary hand tools, and access to proper shop equipment:

CAMSHAFT, new. Ground specially for your engine. Give full specifications of your engine and type of use you will put it to. Our cams will idle because they will conform to your engine improvements and give you the most possible from them. We flatly guarantee our cams to produce more useable power in the Studebaker Champion than any other cam, or money back. If you want to trade cams to improve engine breathing as you continue to modify your engine, we do so for only \$7.50 exchange. (Be sure to see special cam sheet on back of "Tune-Up Tips", enclosed) Our new camshaft with new grind, for your engine and use: Order No. CV-18 7 lbs. \$47.00.

CAMSHAFT, used. With new grind as above. (Note: Exchange allowance is \$4.00. Be sure to see the special cam sheet on back of "Tune-Up Tips", enclosed) CV-18A 7 lbs. \$42.00.

CAM GRIND on your cam, as above, or exchange. Order No. CV-18B 7 lbs. \$36.00.

VALVE SPRINGS, matched, plated, high pressure. Resist moisture etching which causes spring breakage. These are the best and we use them in all engines which we build. Full set of 12 springs, tested and compared. Order No. CV-19 2 lbs. \$7.45.

INTAKE VALVES, oversize head, 1/15/32", MORGAN special. 30° seats. Made of highest quality valve material in one piece by the country's largest producer of quality replacement parts, and modified by us for this specific application. Full set of 6. (See paragraph below) Order No. CV-20 2 lbs. \$15.35.

NOTE: Many are confused as to the best way to shape up the valve heads and seats for all out breathing in order to take full advantage of porting, relieving, and a fine special cam grind. To help out on this problem we will include as one of the 6 valves above, our fully modified streamlined valve which you can take to a machine shop as a sample and have all other valves (including exhaust) modified accordingly. The added charge for this is \$1.50 in addition to the set price listed above. If you wish a set of fully streamlined valves ready to go use the following order numbers: Streamlined and lightened intakes as above: CV-120 2 lbs. \$24.35. Streamlined and lightened exhausts: CV-121E 2 lbs. \$19.50. These are priced in sets.

DUAL POINT DISTRIBUTOR, Mallory, for high compression Champion engines. Will operate with a single coil or with Mallory Magspark Transformer. Advise us compression ratio, driving habits, whether mostly easy driving; or hard, fast driving, so we can set up for your use and provide proper condenser. Number C1-12 5 lbs. \$34.50 with clamp

MAGSPARK TRANSFORMER, Mallory, with mounting brackets. Produces two sparks 7° apart of reversed polarity to stop spark plug electrode erosion caused by electronic forces. Gives hot-test battery spark of any ignition even at high speeds. Aids in Winter starting and fires leaner mixtures when cruising to give better economy. C1-12A 5 lbs. \$22.00.

DUAL POINT PLATE, ball bearing, for converting 1951 and later Champion distributors. Full instructions are easily followed. Dual point ignition provides easier cold starting, faster warmup, greater power. Not for 1950 and earlier models. Highest quality for longest life. C1-22 1 lb. \$9.95.

CLUTCH, Special. MORGAN engineered heavy duty assembly including plus-pressure, high test special springs, carefully installed into pressure plate assembly. Driven plate is faced with woven bronze wire-asbestos facing for highest friction. Exactly replaces your present clutch but stops slipping even in severe race work. Longer life than stock facings. Faster take-off. We have the Heavy Duty, and the Triple Duty to take all horsepower applications. CD-23 13 lbs. \$27.40. State which type.

PISTONS, 3-1/8" special MORGAN designed and proven in all types engines, are now in their ninth year of use in dragsters, race cars, sport cars, marine engines, and in just plain family cars. Will not cold slap with road clearance. The FRAMCO piston ring set this piston was designed for includes special deep wall top rings, Flo-Bak oil rings which re-circulate the oil they trap, thereby metering the oil flow to lubricate cylinders perfectly, giving longer cylinder life and holding best against blowby at highest engine speeds. (See back of this folder for full information) Set of balanced pistons: CP-24 8 lbs. \$41.70.

PISTON PINS, light weight, MORGAN designed for the above piston. Special alloy steel ground to exact limits, hard and tough. CP-25 2 lbs. \$5.70.

PISTON RINGS, our special FRAMCO sets described above. Provide best oil control and greatest blow-by protection. Available in Chrome or Regular....Chrome set: CP-26C 1 lb. \$16.95. Regular set: CP-26R 1 lb. \$11.85.

PISTON, PIN AND RING KIT: As above, with Chrome rings: CP-26K 11 lbs. \$61.00 As above, Regular rings: CP-26RK 11 lbs. \$56.00.

ENGINEERING AIDS: We are glad to help you plan your engine improvements so you will have the most power from the least cost. Write us, giving details of what you want from your engine and what changes, if any, have been made so far.

GET MORE 'GO' WITH REGULAR GAS

Better than Double ROAD HORSEPOWER OF STOCK STUDEBAKER CHAMPION ENGINES with MORGAN PISTONS

FOR RACING AND
SPORTS CAR CONVERSIONS

WAFFLE STRUTS under head increase cooling, add strength, while reducing weight of the piston.

STRUT-SUPPORTED PIN BOSSES reduce pin flexure to harmless minimum.

STANDARD THICKNESS WALLS, although piston is .125 oversize. Cuts down weight, adds to engine life.



SPECIAL LOW EXPANSION, HEAT-TREATED ALUMINUM ALLOY PISTON

"GET MORE 'GO' WITH REGULAR GAS"

developed to use our FRAMCO piston ring set using special deep-wall top rings, and Flo-Bak oil rings which recirculate the oil they trap, thereby metering the oil flow to lubricate cylinders perfectly. These rings are available in Chrome or Regular, and we use them in our own race, marine, sports, and passenger car engines producing up to 194 hp and running up past 6500 rpm.

- **FOR ALL** Champion engines, 1939 and later.
- **HEAT DAM** protects top ring from effects of heat of combustion.
- **NO CENTERING HOLE** to burn through when hot fuels are used.
- **PRECISION CAM GROUND** to assure complete freeness without excessive clearance.
- **DESIGNED FOR INDIANAPOLIS TYPE RINGS.** Takes advantage of newest low-friction piston ring engineering.
- **COMES LESS PINS, or PIN FIT** with light-weight special chrome plated pins. Be sure to specify your choice.
- **BALANCED SETS** with weights matched precisely can be supplied. Regular sets priced lower. State choice.
- **THIS IS THE ONLY PISTON** designed for the Champion with these exclusive features. The **MORGAN PISTON** is proper equipment for both race and stock car use when boring cylinders to oversize.

Champion blocks have ample cylinder wall thickness. Overbored engines will run cool with these pistons installed even under severe race use. Excellent for marine use even at engine speeds over 6500 rpm.

Frank Morgan Co.

MARYSVILLE, CALIFORNIA

CUSTOM WORK ON YOUR CHAMPION ENGINE

If you cannot spare your engine to be worked on, we will select for you, and sell to you, a good used Champion stripped engine assembly for \$30.00, less head, which will fit your car.

We do not work on engines in cars . . . only out of cars. Parts not shown may be selected and priced from our parts list. Suggested parts and labor items below are for suggestion and reference only. Depending on your requirements, you may select the components for your engine. If in doubt, please feel free to write without obligation.

Tear down used block assembly, clean and inspect parts:	\$ 18.00
Bore cylinders, hone with cross-hatch finish, fit pistons, labor only:	24.00
Port block, fit intake valves with 30° seats and 1-15/32" heads, labor only:	25.00
Radius intake and exhaust valve heads, and polish:	6.00
Relieve block between cylinders and valves 5/32", and polish:	25.00
Re-grind crankshaft to .010" mains and throws, micro-finish:	14.50
Balance entire engine:	38.00
Select, hand fit, and assemble all parts to exact tolerances in order to complete block assembly:	49.00
Install manifold, head, flywheel, clutch . . . labor only:	8.00
Gaskets and seals for entire engine:	4.75
Racing set of triple stub manifolds, polished aluminum, with chrome balance tubes, for Stromberg 81 carburetors: NOTE*	47.50
Racing set of three 81 Strombergs, rebuilt for alcohol:	42.75
Road set of three 81 Strombergs, rebuilt for gasoline:	33.75
Three Hellings race type chromed air cleaners, heavy duty:	12.25

*NOTE: When ordering, state whether for production Champion engine in production car, or if for race or marine use. If the latter, state whether engine is level, and if not, the degrees that it is raised or lowered *in front*, so we can machine for level carburetors. If for marine, degrees should be figured at planing speed when under way.

Set of main and rod inserts:	19.25
Set of oversize valve lifters, if needed:	12.36
Set of stock exhaust valves, (6):	7.20
Valve guides, a set:	4.56
Cam bushing set:	2.45
Super full race kit, including 8% Federal Excise Tax. See Budget Sheet Illustration:	319.00
Drag race clutch assembly provides no-slip, fast shifting:	27.40
Special front engine plate timing gear oiler:	5.95
Plated water outlet to match polished aluminum head:	2.95
Chopped and balanced flywheel for 1947 and later models:	30.00
Crating for shipment: 7.50 Set up and run in engine:	10.50

NOTE: 8% Federal Excise Tax will apply unless we work on your engine at your direction. Sometimes your buying through us an extra stripped engine assembly will save quite a bit, for this reason.

Should you care to do the work yourself, or have it done locally, we will be glad to help you in every way, and see that you are given full instructions so that the engine will be just right *the first time*.

Frank Morgan Company

MARYSVILLE

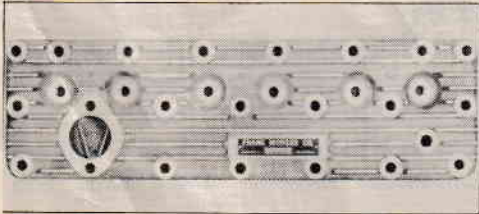
CALIFORNIA

Prices effective December 3, 1950. Revised December 1, 1953. Subject to withdrawal or change without notice.

Frank Morgan's STUDEBAKER CHAMPION ENGINE IMPROVEMENT BUDGET SHEET

Group 1

For those who like to do their own work and who enjoy setting up their own carburetors. Full installation instructions included.



STARTER:

Includes a beautifully polished aluminum high compression cylinder head of 8.5-1 ratio, strongly finned inside and on top for proper heat dissipation. Carefully formed combustion chambers help increase stock horsepower up to 12% and improve gas mileage. Gasket and washers furnished.....

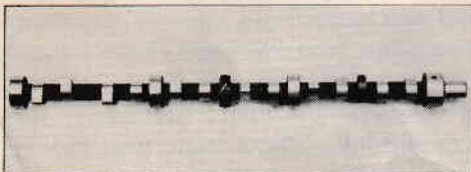
\$51.35*



STEPPER:

Includes all above, and in addition a highly polished aluminum alloy log type dual manifold with sturdy built-in throttle linkage, carburetor mounting studs, and bright plated acorn nuts, complete with manifold gasket. Will improve horsepower at critical speeds up to 12% with proper carburetion. Please state year model of your Champion.....

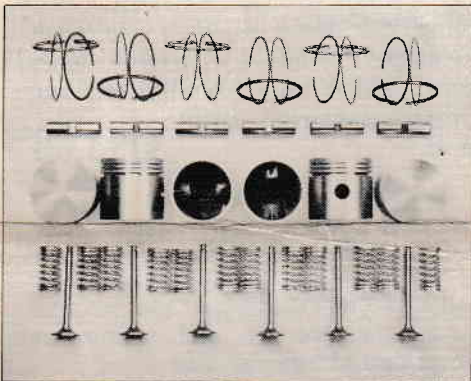
\$91.35*



FULL HOUSE:

Includes all above, and in addition a camshaft ground just for your engine and use. Will improve performance greatly. Please indicate year model of your Champion and whether for road, hard top, sport car, or race use; and whether extreme top speed is to be preferred over all else.

\$135.35*



FULL RACE:

Includes all above, and in addition a set of special over-size 30° intake valves, a set of plated, corrosion-resistant matched valve springs, a set of light weight piston pins, and a set of solid skirt, custom machined, high strength, low expansion aluminum alloy racing pistons made expressly to use the set of Indianapolis-type rings which are included.....

\$215.00*

WE GUARANTEE YOUR SATISFACTION

We will help you in every way possible to obtain the results you want. All items not built especially for you on order may be returned for full refund if transportation charges are prepaid; if return is made within ten days of receipt; if items are in new condition other than for those few days use; and if items are not satisfactory or as represented.

* Includes Federal Excise Tax
Please see exchange items on last sheet of price list.

EARN 2% CASH DISCOUNT by sending full remittance with order, including enough for transportation. Better send too much than too little; we will immediately refund any excess payment.

If you wish shipment made C.O.D., be sure to enclose 25% of the total amount of your order.

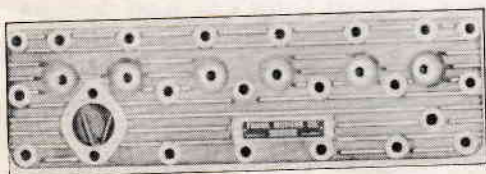
Frank Morgan Company

MARYSVILLE, CALIFORNIA

Frank Morgan's STUDEBAKER CHAMPION ENGINE IMPROVEMENT BUDGET SHEET

Group 2

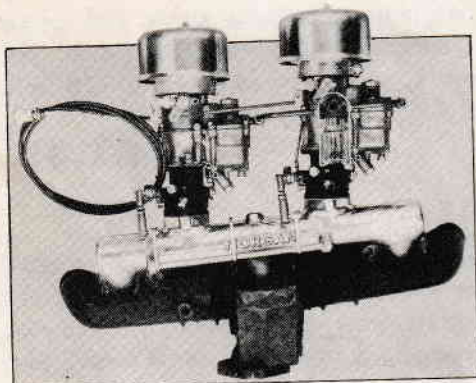
For those who want the best in a hurry, and who want to know the job will be right the first time out. All items tested, matched, and proved out carefully before shipment. Full instructions for quick installation.



SUPER STARTER:

Includes a beautifully polished aluminum alloy high compression cylinder head of 8.5-1 ratio, strongly finned inside and on top for proper heat dissipation. Carefully formed combustion chambers help increase horsepower up to 12% and improve gas mileage. Chromed "Slip-On" acorn head bolt covers and plated washers are included as is the head gasket.....

\$53.78*

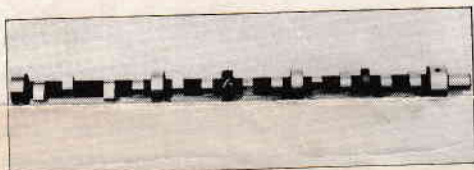


SEE PRICE LIST FOR
SPECIAL LOW AIR CLEANERS
FOR 1953 AND LATER.

SUPER STEPPER:

Includes all above, and in addition a highly polished aluminum alloy improved log type dual manifold with dual carburetors installed and adjusted for your engine. Will idle smoothly yet give you a burst of power when needed. These are not stock carburetors, but are new and completely reworked and balanced to fit your engine displacement and use. Only volume and careful cost control can allow this custom assembly at this moderate price. Includes hand choke button and wire, fuel filter, fuel lines between carburetors, sturdy built-in throttle linkage completely adjusted and ready for your stock throttle rod to slip into. (Please state year model of your Champion.) Bright chromed, efficient, race-type air cleaners are in place. Includes special modified exhaust manifold (with gasket) to fit under the dual manifold without alteration of your present parts. Nothing has been overlooked. Carburetors are even fastened to manifold with studs capped with brightly plated acorn nuts! A truly beautiful and compact assembly. Will improve horsepower at critical speeds as much as 12%.

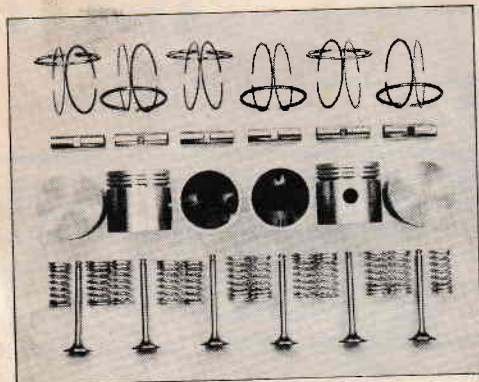
\$193.60*



SUPER FULL HOUSE:

Includes all above, and in addition, a camshaft ground specially for your engine. Will improve performance greatly. Please indicate year model of your Champion and whether for road, hard top, sport car, or race use; and whether extreme top speed is to be preferred over all else.

\$237.60*



SUPER FULL RACE:

Includes all above, and in addition, a complete set of special oversize 30° intake valves, a set of plated, corrosion-resistant matched valve springs, a set of light weight piston pins, and a set of custom machined, high strength, low expansion aluminum alloy racing pistons made expressly to use the set of Indianapolis-type rings which are included.....

\$319.00

* Includes Federal Excise Tax.

Please see exchange items on last sheet of price list.

See Terms of Sale and Guarantee of Satisfaction on other side.

FRANK MORGAN CO. •

• MARYSVILLE, CALIFORNIA

SPECIAL REBUILT CHAMPION ENGINES
RATED 100 HP AT 4000 RPM.

Subject to our ability to fill orders, we will rebuild a limited number of Studebaker Champion engines for \$235.00 including parts, giving you a new engine guarantee of 4000 miles or 90 days, whichever occurs the first.

If you cannot spare your old engine assembly for rebuilding (which takes one week) we will furnish a suitable used engine assembly at a cost to you of \$30.00, and rebuild it for you. We will then allow you \$30.00 for your old engine when received by us prepaid, when it is found to be rebuildable. We advise you to have your mechanic remove the valves and check for cracked seats before shipping it to us, using crate we shipped your engine in. Be sure to include cylinder head, water outlet, crankshaft pulley, vibration damper, and oil pan. If you wish your engine run in, please add \$10.50 for labor, gas, and oil. Crate charge is \$3.00.

We require a 50% deposit with each order, with balance due either before shipment or COD. Kindly wait for verification of delivery date before removing your old engine, as we cannot work to deadlines and maintain this low price.

Please give year model of car or pickup or truck; location of oil filler pipe (front or rear) and location of dip stick when ordering.

These engines are rebuilt in our own shop to race standards, and include the following special parts not usually obtainable in any rebuilt engine, or even a new engine, for that matter:

Chrome plated main and rod
journals on crankshaft.
New crankshaft gear.
New camshaft gear.
Chrome ring set.
Cross-hatch honed cylinders.
New oversize intake valves.
New exhaust valves.
New plated race valve springs.
New tin plated pistons.

Late type camshaft, high lift.
New micro rod, and main bearings.
New valve lifters, if oversized.
New valve guides.
Each block is ported and polished
just like our race engine jobs.
This alone would cost you \$45.00
separately on a race engine.
Each engine bears a name plate
with its own serial number.

The chrome shaft and rings will increase engine life in dusty service up to four times that of the ordinary engine not protected with chrome.

Compression ratio 8.0 - 1 to operate on regular gas. Careful assembly and the use of fine parts, with low friction chrome crank and ring set will show better gas mileage, faster acceleration, and the 100 HP will be a life saver in commercial cars, automatic drives, and regular pleasure cars. All cranks are magnetic particle inspected for flaws before chroming. Pistons fit by factory methods.

Here is the way to figure your cost: Engine assembly deposit, \$30.00 which you receive when engine is returned to us prepaid. You send \$147.50 total deposit, then either send us \$117.50 upon completion of your engine, or have us COD the shipment. We send engine ready to install with head, pan, water, outlet, thermostat, crank pulley and vibration damper in place. You save on installation because of this. Your net cost is only \$235.00 plus freight.

Prices effective December 31, 1953 and subject to change without notice.