

# KINNER SERVICE BULLETINS

(Retyped)

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**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

March 31, 1943

E-1-11

SUBJECT: FLOAT NEEDLE SEATS NA-R5, NA-R5A, NA-R6  
STROMBERG CARBURETORS

There have been a few isolated cases where the needle seats of the old style NA Series Carburetors have loosened up in service. In order to overcome this difficulty, we are attaching Aircraft Carburetor Service Bulletin #32 as issued by the Stromberg Aircraft Carburetor Section, and suggest that you be guided by the instructions therein.

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

Attachment to Kinner SB E-1-11

February 20, 1940

**AIRCRAFT CARBURETOR SERVICE BULLETIN NO. 32**  
**LOCKING FLOAT NEEDLE SEATS**  
**IN NA-R5, NA-R5A AND NA-R6 CARBURETORS**

Because there is a possibility of old style float needle seats in NA-R5, NA-R5A, and NA-R6 Carburetors coming loose in service, resulting in the engine stopping, the later carburetors have been provided with a knurled ring on the float needle seat and a lock clip and screw to prevent the seat from coming loose.

Old style carburetors which do not incorporate the lock clip may be reworked in accordance with the attached sketch so that a locking device may be used with a new seat. This reworking consists of counterboring to the 7/16" dimension from the bottom of the seat gasket surface, then drilling 9/16" deep with a #25 (.149) drill and tapping #1024 NC-2 7/16" deep .589" from the center of the seat. A new style Seat, P-13677, having the latest knurled ring should then be assembled tightly and EX-1057-74 Spacer, P-13898 Lock Clip, P-6668 Lockwasher and P-8898 Screw should be assembled tightly.

**STOMBERG AIRCRAFT CARBURETOR SECTION**  
Bendix Products Division  
South Bend, Indiana U.S.A

Form No. 10-463

Printed in U.S.A.

# Kinner Motors, Inc.

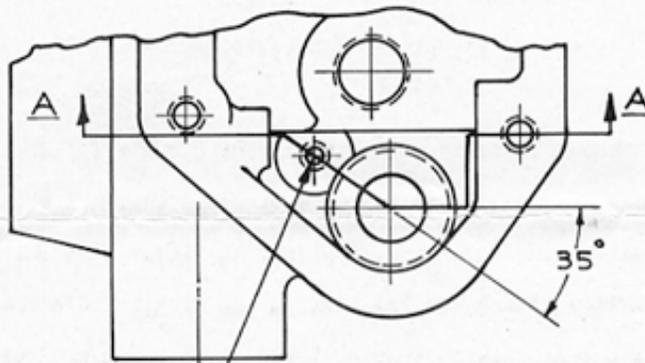
635 W. Colorado Boulevard, Glendale California

## BULLETIN

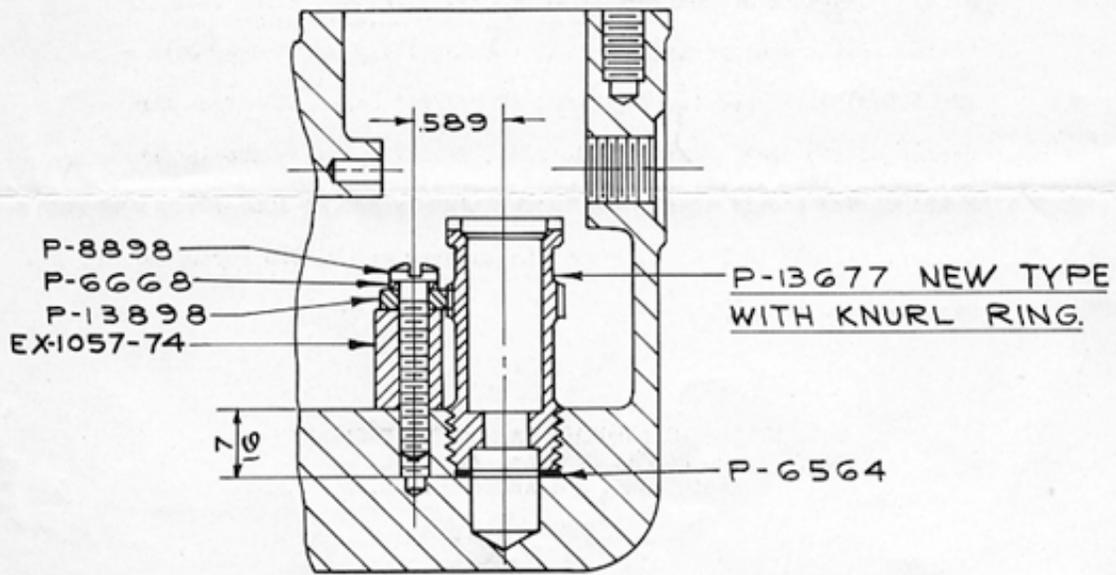
Attachment to Kinner SB E-1-11

### INSTRUCTION CHART #1077

INSTRUCTIONS FOR ADDING LOCKING CLIP TO FLOAT NEEDLE SEAT ON NA-R5, NA-R5A & NA-R6 CARBURETORS IN SERVICE.



1/2 DIA. C'BORE TO 7/16 DIM.  
#25(.149) DRILL 9/16 DEEP &  
#10-24 NC-2 TAP 7/16 DEEP.



SECTION A-A

**Kinner Motors, Inc.**  
 635 W. Colorado Boulevard, Glendale California  
**BULLETIN**

**KINNER MOTORS, INC.**

635 W. COLORADO BOULEVARD • GLENDALE, CALIFORNIA

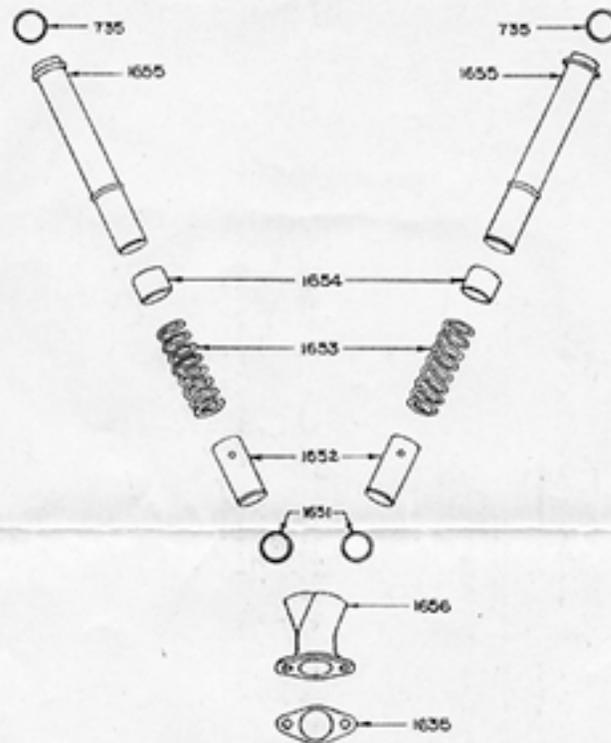
**BULLETIN**

March 31, 1943

E-1-12

SUBJECT: PUSH ROD HOUSINGS KINNER R-5 SERIES 2, B-5, B-54 & K-5 - REAR EXHAUST

It has been brought to our attention that difficulties have been experienced with the old style push rod housings, wherein the housing spring or housing has become bent in such a manner that the push rod rubs the spring with the consequent wearing of the push rod. To forestall any future difficulties that might arise from this old style push rod housing assembly, we are recommending that the new and improved type push rod housing, as is used on the present R-55 engine, be substituted for the older type. To make this change, it will be necessary to use the parts as shown in this bulletin.



PART NUMBER	PART NAME	QUANTITY USED PER CYLINDER	LIST PRICE
735	PACKING - Push rod housing upper	Two	\$ .06
1655	HOUSING - Push rod, long	Two	1.50
1654	FLANGE - Push rod housing spring top	Two	.40
1653	SPRING - Push rod housing	Two	.12
1652	COVER - Push rod housing spring	Two	.85
1651	PACKING - Push rod housing lower	Two	.10
1656	ADAPTER - Push rod housing, rear exhaust	One	4.60
1635	GASKET - Push rod housing adapter	One	.05

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

March 31, 1943

E-1-13

SUBJECT: EXHAUST VALVE K-5 & B-5 ENGINES

Results, both from tests and from production engines, have shown that a new and improved type of exhaust valve is superior to the valve now in use on the K-5 and B-5 engines. It is recommended that the present valve be replaced by the new exhaust valve, preferably at the next top overhaul or at the next major overhaul.

PART NO.	PART NAME	LIST PRICE
1593	Exhaust Valve K-5 & B-5	\$ 13.50

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

September 1, 1943

E-1-14

SUBJECT: TORQUE LIMITS ALL MODELS KINNER ENGINES

Your attention is directed to the following table in which certain torque limits are to be observed when tightening subject parts as designated:

TORQUE LIMITS

<u>Description of Limits</u>	<u>Min.</u>	<u>Torque in Inch Pounds</u>	
		<u>Desired</u>	<u>Max.</u>
Plug – Spark	450		480
Nut – Master Rod Bolt	400 and Tighten to Next Cotter-Pin Slot		
Nut – Cylinder Barrel to Crankcase	250	275	300
Nut – Cylinder head to Barrel	175	200	225

GENERAL TORQUE LIMITS

<u>Thread Size</u>	<u>Desired Torque in Inch Pounds</u>
1/4 inch	75
5/16 inch	100
3/8 inch	275

NUT – THRUST BEARING LOCK (R-56 only) 600 FOOT POUNDS

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

November 13, 1943

E-1-15

SUBJECT:        INTAKE VALVES, KINNER K-5 ENGINES

It has been brought to our attention that difficulties have been experienced with the Intake Valve, Part No. E-21. To forestall any future difficulties that might arise from the continued use of this intake valve, we are recommending that the new and improved type intake valve, Part No. 720 be substituted for the older type valve.

In making the change-over from No. E-21 Intake Valve to No. 720 Intake Valve, it will be necessary that the old Intake Valve Guide be removed and replaced with a new Intake Valve Guide, which guide will be oversize on the O.D.

The seat angle of No. E-21 is 30° whereas the seat angle of No. 720 is 45°. If the old valve seat is in such a condition that reconditioning of the seat is possible this may be done; otherwise, it will be necessary that the old valve seat be removed from the cylinder head and new oversize valve seat be installed. The work outlined above can be accomplished at any certified overhaul activity.

To make this change, it will be necessary to use the parts included in the bulletin.

<u>PART NO.</u>	<u>PART NAME</u>	<u>QUANTITY USED PER ENGINE</u>	<u>LIST PRICE</u>
720	Intake Valve, 45 ° Seat	5	\$12.60 ea.
719-X	Intake Valve Guide .010 Oversize O.D.	5	1.50 ea.
233-Z	Valve seat .020 Oversize O.D.	5	2.10 ea.
558	Valve Collar Circlet	5	.04 ea.
562	Valve Safety Circlet	5	.04 ea.
1276	Valve Collar	5	2.30 ea.
1277	Valve Collar Wedge	5	.75 ea.

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

November 26, 1943

E-1-16

SUBJECT: SPARK PLUGS FOR ALL MODELS KINNER ENGINES

In order to combat any possibility of difficulties arising from the improper type of spark plugs being used, or improper overhaul and maintenance, the following information is given.

1. RECOMMENDED PRODEDURE FOR INSPECTION, MAINTENANCE, AND OVERHAUL FOR SPARK PLUGS

- (a) Daily inspection should be made on spark plugs to determine that they are free from cracks, terminals are tight and not worn.
- (b) After every 25 hours of operation, spark plugs should be removed for inspection, cleaning and resetting of gaps.
- (c) After every 100 hours of operation, all spark plugs should be removed and replaced by either new or reconditioned spark plugs.

2. FOR OVERHAULING OR RECONDITIONG BD SPARK PLUGS, THE FOLLOWING PRODEDURE SHOULD BE USED

Disassemble the spark plug, remove the core gasket, clean cores with No. 150 Aloxite Cloth or No. 00 Sand Paper to remove all traces of carbon, lead ozy-bromids, etc., from exposed mica core. Finish cleaning core using No. 300 Aloxite Clothe or No. 000 Crocus Cloth. Mica must be smooth when finished. CAUTION: Never use emery, carborundum, or metal buffing wheels or sand blast for cleaning mica plugs. After cleaning cores wash the cores, using a brush and clean with unleaded gasoline. Cores should never be permitted to stand in gasoline for more than a few minutes. After drying cores inspect for breaks or injuries to the insulation. If insulation is broken, flaked, or dented, or if there are holes in the mica, the cores should not be used. Attention should be paid to the condition of the terminal connection, electrode and threads.

3. SHELL CLEANING

Shells may be soaked in clean unleaded gasoline to remove oil and soft carbon. Hard carbon and lead deposits may be removed with a knife or round wire brush. Care should be used to prevent damage to the internal threads or core gasket seat. After cleaning, the shell should be dipped in

boiling water after which the shells can be dried. The shells should be inspected for damaged hexagons, condition of the electrodes, and injured threads. When the shell electrodes have been burned away to .032 they are too thin at the tips and can no longer be properly adjusted they should be discarded and new shells used.

4. SHELL ELECTRODES

The four-point shell electrode is designed to conform to the special shape of the center electrode tip

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
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Service Bulletin E-1-16 continued

through out its length. If there is proper clearance between the surfaces of the shell and core electrodes the electrode burning is uniform, less frequent gap setting is required and a longer electrode life is attained. In order that the spark plug shell electrode conforms to the curvature of the core electrode and has uniform clearance throughout its length, it must be correctly formed with a specially designed tool. The proper tool for forming the electrodes, as furnished by the BG Corporation, is the M-402 Electrode Forming & Adjusting Tool.

5. ASSEMBLING OF SPARK PLUGS

Assemble the core into the shell being sure that the core gasket is used. When tightening the core to the shell the pressure exerted should not exceed 350" lbs. (approximately 30' lbs.). After assembling the proper gap should be set; the best method for setting the gap is to use the gap setting fixture as supplied by the BG Corporation. After proper setting of the gap, the spark plug should be pressure tested, using a pressure of approximately 125 lbs per square inch. The plug should spark continuously under this test pressure.

6. FOR OVERHAULING CERAMIC SPARK PLUGS, THE FOLLOWING PROCEDURE SHOULD BE USED

In preliminary inspection the spark plugs should be given the following inspection so as to eliminate those which are of no further service:

1. Inspect wiring and of insulator for cracks.
2. Inspect the center inside of electrodes to determine whether further gap setting is advisable.
3. Inspect boxes for distortion.
4. Inspect for badly damaged threads.

Spark plugs not passing any of the above inspections should be discarded.

7. CLEANING

Clean all dirt and grease from the outallds of the plug. A fine wire brush may be used to clean the threads. If any oil has accumulated in the wiring of the plug it can be cleaned out by flushing in non-leaded gasoline or carbon tetrachloride.

8. SAND BLASTING

The firing end of the spark plug should be subjected to a light sand blast to remove deposits from the insulator and bore of shell. Do not subject the spark plug to the sand blast for too long a period as this may damage the electrodes and possible the end threads of the shell. The sand blast should be used only as much as is absolutely necessary to remove deposits. After sand blasting give the plug a thorough cleaning by blowing out with air to remove all traces of the abrasive cleaning compound.

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

Service bulletin E-1-16 continued

9. GAP SETTING AND TESTING ON PLUGS WITH THE FOUR PRONG ELECTRODE

It will be necessary that a special gap setting tool be used. Discard any four prong plugs that have the gap set too closely. Do not attempt to pry open the gap as the plug may be seriously damaged. Plugs with a single flat ground electrode may be reset by bonding the side electrode until the specified gap is attained. After the proper setting of the gaps, the spark plug should be subjected to a pressure test. If the spark plug fails to fire consistently under pressure it should be discarded.

RECOMMENDED SPARK PLUG MODELS AND GAP CLEARANCES FOR ALL MODELS KINNER ENGINES

<u>Model</u>	<u>Gap Clearance</u>
RG 417	.015
Champion C-26	.015
Bendix Scintilla 437	.015

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

S  
- 86  
D

August 6th 1930

SUBJECT: Installing cylinder head on barrel.

Upon breaking the cylinder head to barrel joint in the course of removing and installing the cylinder head, the following instructions are extremely important.

1. Always use a new gasket upon installing a cylinder head on the barrel.
2. See that the gasket is centrally located; in other words, the gasket must not overhang on either side.
3. Be sure that the gasket's surfaces are not marred and that the gasket seat on the cylinder barrel is not marred. Scraping the gasket seat will ruin it, as the same has to be perfectly smooth in order to obtain the proper seal.
4. It is necessary to have 100% contact between barrel land, gasket and head, as well as uniform tightening of nuts to insure a non-leaking, pressure tight cylinder head to barrel joint under operating conditions.

**Kinner Motors, Inc.**  
635 W. Colorado Boulevard, Glendale California  
**BULLETIN**

S  
-88  
D

August 11th 1930

SUBJECT: Ordering Replacement Pistons:

In ordering replacement pistons, care should be exercised to ascertain if there is a weight stamped on the replacement piston.

It is the present practice of our production department to stamp the weight on the pistons and this same weight should be transmitted to the factory when ordering pistons. By following these instructions, no difficulty will be encountered with rough engines as a result of unbalanced piston assemblies.

Where weights are not marked on piston, get the weight to nearest 1/10 ounce of the bare piston with out rings or pins and state this with your order.

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

D  
S - 90  
O

August 16th 1930

SUBJECT: Tappet clearances – K-5 Engine.

Tappet clearances, that is, clearance between valve and rocker arm, must be maintained at the specified amount, namely between .015 and .020. Excessive clearance results in excessive deterioration of valve seats. On the other hand, insufficient clearance results in hard starting. If the valve holds open, never closes, there will be considerable loss of power, as well as rapid deterioration.

Inspection and checking of tappet clearances should be made at regular intervals to insure that they are within these specified limits. Check of the tappet clearances should be done when the engine is cold, that is, at atmospheric temperatures. After the tappet clearances have been set, it is necessary that the adjustment be locked before the job is left. This locking must be checked after the engine has been check-run to be sure that locking is effective.

NNT

**Kinner Motors, Inc.**  
635 W. Colorado Boulevard, Glendale California  
**BULLETIN**

D  
O - 91  
S

August 16th 1930

SUBJECT: Cylinder hold-down nuts, B-5 (440 cubic inch) engine.

Whenever cylinders are removed from these engines, the following precaution must be observed in reassembling.

The nuts on the cylinder hold-down studs must be placed with the chamfered corners toward the flange, in order to avoid interference with the barrel to flange radius. If this is not done, nuts will loosen and hold-down studs will break.

NNT

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

S  
-98  
D

October 13th 1930

SUBJECT: Oil pressure, K-5 and B-5 model engines.

In cold weather it will be noted that very high oil pressure may occur when an engine is started up. These high oil pressures give protection to the engine but may break the usual oil gauge, particularly if the maximum capacity is below 200 lbs. per square inch. The reason for the high oil pressure is that the pressure relief valve does not operate until the cold oil between the valve and tank has been pushed from this line. Whether the oil pressure is going to be high or not can be determined by cranking the engine over by hand.

If grades of oil heavier than those recommended for the particular season of the year are used, it is certain that these high oil pressures will be encountered. If the engine is speeded up before the oil is warmed up, high oil pressure will result.

To avoid oil gauge breakage and to insure adequate circulation of oil in the engine, use preheated oil in cold weather, of the grade specified. Watch the oil pressure gauge closely when starting and warming up the engine and do not speed up the engine before oil circulation is well established.

NNT

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

S  
-100  
O

October 14th 1930

SUBJECT: Heywood Starters.

There have been brought to our attention cases where the Heywood starter has been used with the engine at full throttle with the idea of getting more power from the engine. This practice can cause very bad pre-ignition and over-loads of the engine, which can wreck engines.

Where Heywood starters are used, inspection of check valves at cylinder heads should be made at least every fifty (50) hours of engine operation to determine that there is no leakage. When leakage occurs, the pipes adjacent to the valve are unusually hot: also, the engine will not operate smoothly or up to power.

Under no consideration should the air bottle be charged from an oxygen tank, as this will result in an explosion which wrecks the starter or the engine.

NNT

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

O  
D  
M - 117  
S

January 17th 1931

SUBJECT: Starting Kinner Engines:-

Difficulty in starting Kinner engines is in practically all cases due to error in procedure or to use of fuel of insufficient volatility. No difficulty should be experienced if instructions contained in Kinner instruction manuals are followed but we wish to call your attention particularly to the following points in starting procedure.

**PRIMING:** Where a separate primer is not used, priming of the engine is accomplished by means of the accelerator pump on the carburetor which is operated in conjunction with the throttle. By moving the throttle back and forth the carburetor is flooded with gasoline and if the propeller is turned over at the same time, sufficient gasoline will be drawn into the cylinders to prime the engine. Working the throttle back and forth without turning the propeller at the same time will result in nothing more than flooding the carburetor.

When separate primer pumps are fitted to the engine to facilitate cold weather starting, do not over-prime since excessive gasoline will wash the lubricating oil from cylinder walls and this may result in piston seizure, especially in cold weather when the oil is heavy. Starting instructions, especially in regard to priming, will be found on a tag which will accompany each new Kinner engine from the factory. If the owner fails to find this tag on a new engine, he should write to the factory at once.

**GASOLINE:** Obtain the most volatile aviation grade gasoline available in order to facilitate cold weather starting. Fuel conforming with military fighting grade aviation gasoline is the most desirable but if this is not available, use the best aviation grade of gasoline which can be found. The following is a partial list of gasoline's which have been found to meet fuel requirements as stated in the Kinner Instruction Manual:-

Gulf Aviation Gasoline, Gulf Refining Company  
Phillips Aviation Gasoline, Phillips Petroleum Co.  
Richfield Aviation Gasoline, Richfield Oil Co.  
Shell Aviation Gasoline, Shell Oil Company  
Stanavo Aviation Gasoline, Standard Oil Co. of CA., IN., and NJ..  
Sunoco Aviation Gasoline, Sun Oil Company  
Texaco Aviation Gasoline, Texaco Corporation  
Union Aviation Gasoline, Union Oil Company

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

M  
S  
D - #122  
O

March 26th 1931

SUBJECT: Care of Apollo Impulse Coupling.

Proper functioning of the Impulse feature of Apollo Impulse Couplings is sometimes impaired by engine oil getting into the internal parts of the coupling or by excessive corrosion where the engine is operated in close proximity to salt water.

Daily application of kerosene by means of oil can will prevent rusting and keep the coupling free from heavy oil.

If the impulse feature is functioning properly, the operator will be able to hear it snap when the engine is turned over slowly with switch off. The impulse feature does not function when the engine is being turned faster than about 80 R.P.M.

NNT

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

O  
S - #127  
M

SUBJECT: Lubrication of Exhaust Valve Guides.

Excessively worn exhaust valve guides are often responsible for valve trouble which is attributed by the operator to valves and valve seats. Owners have on various occasions sent exhaust valves with ruined seats into the factory claiming adjustment on account of soft valve material when the real source of the trouble lay in sloppy exhaust valve guides. On other occasions owners have ground valves repeatedly at short intervals before discovering that the source of the trouble lay in a badly worn guide.

Always check valve guide clearance when the occasion arises to grind valves and replace the guide if the clearance approaches .010 of an inch. New valve guides should be reamed to provide a clearance of .003 of an inch, not more than .004 nor less than .0025.

Read the section on Valve Guides, page 13 and 14 of the Overhaul Manual, very carefully.

The life of valve guides may be lengthened to a great extent by application of a good penetrating valve lubricant, such as Marvel-Oil, at intervals of ten to twenty hour engine operation. We strongly recommend lubrication of valve guides at frequent intervals provided a high grade penetrating, non-burning, valve stem lubricant is used. Do NOT lubricate valve stems with ordinary engine oil since it would deteriorate within a few minutes and leave a deposit of abrasive carbon on the valve stems.

RRM

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

O  
D - #130  
S

July 15th 1931

SUBJECT: VALVE GUIDES

ENGINES EFFECTED: All types Kinner K-5, B-5, and C-5

It is inevitable that valve guides or valve stem bushings in air-cooled aircraft engines will wear out. Just how much service can be obtained before wear reaches a stage where replacement is required is largely dependent upon operation and maintenance.

From the point of view of economical operation, valve guide wear becomes tremendously important in as much as practically all exhaust valve trouble has its origin in excessively worn valve guides. Freedom from blowing valves and forging out of valve faces is largely dependent on maintaining proper valve guide diametrical clearances, a table of which will be found in the Kinner Overhaul Manual and Parts List, also on a separate sheet accompanying this bulletin.

It is therefore advisable to frequently check the clearance of the valve stem in the valve guide, especially on the exhaust side, so that excessive wear may be detected and guide replaced before damage results. It is not necessary to remove the valve in order to make a preliminary examination in this respect. Simply remove the valve cover and press down on the valve with the two thumbs, then try to wiggle it from side to side. If any appreciable amount of play is felt, the guide should be checked for actual diametrical clearance and replaced if worn to replacement limit. Cases of excessive clearance will sometimes result in valve springs having a burned appearance.

If exhaust valve guides should wear out prematurely or within an abnormally short time between normal top overhaul periods, the cause should be determined and corrected. If it is a genuine Kinner valve guide the trouble would not likely be in material. Kinner exhaust valves are made from a "material" which has been found, after a vast amount of research, to provide the longest life of any material available in connection with "D" metal Kinner exhaust valves. The first rule is:-

**USE ONLY GENUINE KINNER EXHAUST VALVE GUIDES IN  
A KINNER ENGINE**

Owing to inspection processes non-uniform material in genuine Kinner exhaust valve guides is highly improbably and can for all practical purposes be eliminated as a probable cause, should excessive or premature valve guide wear be encountered. The source of the trouble might, however, be in any one of the following elements. –

1. Excessive cylinder head and valve temperatures, due to
  - (a) Detonation resulting from a poor grade of gasoline, having low anti-knock value (See instruction manual for fuel requirements).

# Kinner Motors, Inc.

635 W. Colorado Boulevard, Glendale California

## BULLETIN

Service Bulletin #130 continued

- (b) Detonation and pre-igniting due to defective spark plugs or the use of a "Hot" plug of inferior quality. Only BG #4 Hornets are approved for use in Kinner engines.
- (c) Lean mixture which might be due to an air leak in the induction system or to carburetor main metering jet being too small and not adapted to the local gasoline and operating conditions. Satisfactory carburetor jet sizes vary to some extent according to variation in fuels available in different sections of the country and the standard factory setting is not always best adapted. If it is believed that wear is due to over heating on account of a too lean jet setting, try a main jet of a slightly larger size. For instance, the standard main metering jet in Holley carburetors on B-5 engines is size #51 and in order to obtain a slightly richer and cooler mixture, install a No. 49 main metering jet. If the valve guide trouble is prematurely experienced on one cylinder only, check the intake pipe and connections very carefully for an air leak. Checking for air leaks in the induction system should be done very carefully since they do not always result in a whistle which can be readily distinguished.
2. An excessive amount of dust and sand taken in through carburetor air intake may result in premature valve guide wear. An air intake duct leading from the side or top of the cowling is always advisable, especially if the engine is operated from a sandy or dusty field.
3. Excessive wear on valve guides may be due to failure to lubricate them frequently with a good penetrating valve oil such as Marvel Oil. A plentiful supply of good valve stem lubricant (never use engine oil) should be applied to the valve stems at each 20 hours check period, and even more frequently in order to further lengthen the life of the valve guides.

Getting back to overheating of cylinder heads and valves and resultant excessive wear in exhaust valve guides due too lean a mixture, it is unfortunate, but true, that there is a great variation in the grades of domestic aviation gasoline's available throughout the country. Pilots who fly about the country extensively often remark about variations in the operation on engines as a result of obtaining various grades of fuel at different points. Sometimes after taking on a supply of gasoline at some point enroute, the engine will suddenly become rough. This is due to detonation and pre-igniting and valve guides suffer greatly under such conditions. At other times an operator will insist on cruising at an engine speed which is at, or very near, the point where carburetor is changing from low to high speed jets. In such cases the engine will run rough and cough occasionally on account of improper carburetor mixture. The remedy is to open up the throttle to a little higher engine speed or change to a larger main motoring jet if this characteristic happen to occur at from 1700 r.p.m. to 1750 r.p.m. with the gasoline being used. If there is any question as to the proper jets required to obtain the most satisfactory operation with aviation grades of gasoline locally obtainable, consult the nearest authorized Kinner Service Station.

In regard to the amount of service to be normally expected from the exhaust valve guides, we have known of several cases where 400 hours were obtained before replacement was required. In a few exceptional cases it has been necessary to install new guides at as low as 60 hours, due to conditions under which the engines were operated. In the opinion of the writer of this bulletin, at least 250 hours should be obtained on one set of exhaust valve guides with possibility of much more service if proper precautions are taken in correcting any unfavorable operating conditions.

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

Servic Bulletin #130 continued

However, one can readily appreciate, in the light of the above discussion, why we cannot guarantee or specify a definite period of operation before valve guides should be replaced, owing to the effect of many operating conditions controlled by the operator.

If you are not getting satisfactory service out of the exhaust valve guides on you engine, check the elements governing valve guide wear as explained above and apply corrective measures. By so doing, you will enjoy to the fullest extent the operating economy for which Kinner engines are noted.

The Authorized Kinner Service Station for your territory will be glad to help you with this or any other problem regarding operation of your engine. A letter addressed to the Service Department at the factory will also receive prompt and courteous attention.

It is important to use ONLY KINNER VALVE GUIDES when replacements are necessary.

RRM  
LM

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

O - #133

August 3rd 1931

SUBJECT: Propellers

ENGINES EFFECTED: All Models Kinner Engines.

The number of cases reported to us by field representatives where propellers on Kinner engines in the field are found to be out of balance or out of track, leads us to believe that this very important element in successful operation of aircraft engines is being overlooked by many owners

Consider the stresses applied on the crankcase front cover thru the front main bearing when the propeller blades are not following the same track or when the propeller is out of balance. If the propeller is true in every respect it exerts a smooth forward pull on the crankshaft which stress is evenly exerted against the thrust bearing to the front over, thence to the crankcase, thence to the engine mount and the ship. When the propeller is not tracking true or is out of balance, it has tendency to whip the end of the crankshaft around and tremendous stresses are exerted on the front cover thru the vibration, or a tendency to vibrate, thus set up. You may not feel or see this vibration in mild cases since the engine is absorbing it but the extraordinary stresses are there nevertheless.

Propeller should be checked for track and balance at each inspection period. Corrections should be made if the track of the two blades varies more than 1/8". The owner should also be sure the propeller is in perfect balance. If a steel propeller is bent by accident, do not use it until it has been thoroughly checked for balance and straightness in a shop properly equipped for adjustment of steel propeller. Power diving will sometimes throw the pitch of a steel propeller out of balance with one blade having more pitch than the other. For this reason the pitch of the blades on a steel propeller should be checked occasionally. The degree marks on the hub of a steel propeller are not sufficiently accurate to check variation in pitch on the blades.

It may prove very costly to permit operation of an engine with a poorly balanced propeller, or a crankshaft which is slightly out of true, since there is a tendency thus to cause failure of the crankcase front cover. If the webbing of the front cover supporting the front main bearing becomes cracked and the owner continues to operate the engine in this condition, the crack will eventually break thru to the outside and the weakened condition of the front cover will also induce a crack to start in the main crankcase.

RRM

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

O  
D  
M – 146  
S

SUBJECT: Use of Direct connected Electric Starters on Kinner Engines

ENGINES EFFECTED: All type K-5, 100 h.p. Type B-5, 125 h.p., under  
Serial #401

Starters which apply the starter load direct to the timing pinion should not be installed on the above mentioned engines, inasmuch as the timing pinion and its connection to the crankshaft is not designed to withstand the high stresses applied by such a starter. Use of inertia or direct connected electric starters on the above listed engines may result in causing the timing pinion to rotate slightly in the crankshaft thus throwing the valve mechanism slightly out of time.

The timing pinion slot on the rear end of the crankshaft was lengthened in B-5 engines after serial #401 with the result that direct connected starters can be used in such engines or in engines in which the new style B-5 crankshaft has been installed.

Anyone contemplating installation of an inertia or direct connected electric starter should first notify the Kinner factory stating engine number, type of ship, date purchased , in order to determine if specific approval of our engineering department can be obtained.

For the above reason the engine warranty is voided if any direct connected starter is applied to Kinner type K-5 and B-5 engines without specific approval of our engineering department in writing.

RRM

**Kinner Motors, Inc.**  
**635 W. Colorado Boulevard, Glendale California**  
**BULLETIN**

O  
D - #150  
S

SUBJECT: GASOLINE AND OIL

During the past two years more than 75% of engine trouble brought to our attention has been traced to the use of inferior fuel and poor grades of oil. A survey over the United States shows that good grades of aviation fuel and aircraft engine oils are available at practically every airport. Kinner engines are guaranteed only when operated on grades of aviation gasoline which have an octane of 73 or better. It is preferable to use fuels with a higher octane rating than 73 if obtainable providing the tetra ethyl lead content is not in excess of 1? to 2 cubic centimeters per gallon of fuel. The Kinner engine warranty is absolutely void if fuel of a lower octane rating than 73 is used in the engine at any time.

Fuels of an inferior grade which are cheaper per gallon than the best fuel obtainable are expensive in the long run. The use of inferior fuel results in overheating and may cause piston seizure, rapid wear of valve guides and valve seats, or broken valves, resulting in excessive maintenance cost. If good gasoline is not available the carburetor must be set richer by enlarging the main metering jet so that the engine will run cooler.

The installation of a General Electric or Weston Electric temperature indicator is advantageous to the operator of an airplane engine. The instrument can be connected with a special washer under the rear spark plug, preferably on all cylinders, but a least on No. 1 cylinder. Temperatures of the cylinder as measured by the gauge with engine at wide open throttle and ship in level flight will vary from 380° F to 450° F with gasoline. Poor gasoline will increase these temperatures immediately and the operator by observing the cylinder head temperatures, can protect the engine from serious troubles.

Recommended oils for use in Kinner engines are found in the instruction manual. Oils conforming to the United States Army Air Corps. Specifications. No. 3556 are the only oils recommended. For air temperatures in excess of 100° F, oils conforming to grade 120 are suitable. For zero or below zero weather oils conforming to grade 77 are suitable. Explanation of the grades is as follows:

77 grade oil is that oil which has a saybolt viscosity of 77 seconds at 210° F

98 oil is that oil which has a saybolt viscosity of 98 at 210 ° F

? oil is that oil which has a saybolt viscosity of 120 at ? F (Original document is unreadable)

**OILS NOT UP TO THESE SPECIFICATIONS ABSOLUTELY  
VOIDS THE WARANTEE**