

Chris-Craft

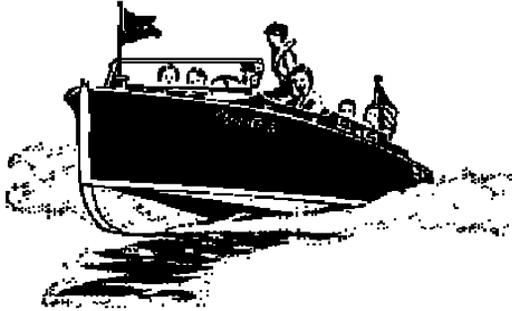
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Advancement
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INSTRUCTION BOOK

and

PARTS LIST

for

CHRIS-CRAFT MARINE ENGINES

K SERIES

6 CYLINDER — 95 HORSEPOWER

(This book does not apply to KL Series)



BOOK NO. TWO
Reprint No. 11

MODEL K—3 7/16" Bore

Effective For K Engines No. 21300 Thru 24999 Inclusive,
Also Engines Between 21142 And 21300 Having Block
Numbers Above 723999
Also For Engines No. 50000 And Up.

Chris-Craft Corporation

Algonac, Michigan

U. S. A.

Cable Address: Chriscraft, Algonac

Printed in U. S. A.

WARRANTY

Chris-Craft boats and Chris-Craft parts manufactured by company are warranted to be free from defects in material or workmanship under normal use and service and the company will replace or repair any part thereof, which shall disclose defects within SIX MONTHS after date of delivery of such boat or part to the original purchaser, and which examination by Company shall determine to be defective; providing that Dealer shall make claim thereon and return said part or parts to Company, transportation prepaid, within 30 days after defect is discovered. The Company does not authorize Dealer to assume for Company any liability in connection with this warranty. Paints, varnishes and chromium plate finishes are believed by the Company to be the best obtainable; however, cannot be guaranteed because of the varying effects which different climates and use conditions have on the same.

This Warranty shall not apply to any Chris-Craft boat or part manufactured by Company, which shall have been altered or repaired outside of the factories of Company.

This Warranty will not apply to any engines, engine accessories or trade accessories not of Company's manufacture which Company may use as these are generally warranted by their respective manufacturers.

This warranty does not cover race boats or racing engines.

Catalogue speeds are estimated or are attained over a certified course at Algonac, Michigan, under favorable conditions and are not guaranteed.

Chris-Craft Corp.

BREAKING IN A NEW ENGINE

The first few hours of operation have a great deal to do with the successful performance of an engine. Engines properly broken in will give much longer satisfactory service.

Before leaving the Chris-Craft factory, your engine has had several hours of "run-in" on the block test and is satisfactory for speeds up to 1500 R. P. M. It should be run for at least 5 hours at not over 1500 R. P. M. and then not over 2000 R. P. M. for the next 5 hours. The engine should not be run at maximum throttle for more than three or five minutes at a time until after the engine has had at least 20 hours.

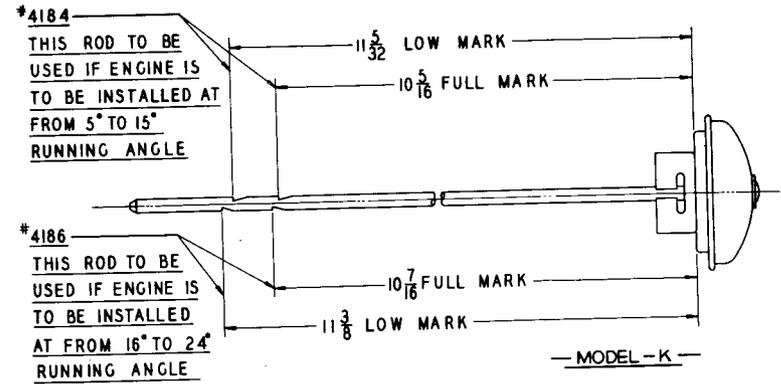
A good way to tell how the break-in period is progressing, is to idle the engine at 1000 R. P. M., turn off the ignition and note how quickly the engine comes to a stop. You will note that the new engine will stop at once but as the break-in progresses, you will note that it does not stop with such a sudden jerk.

An abnormal rise in temperature on the temperature gauge will indicate that you are running a little too fast.

It is recommended that a pint of regular engine oil be added to each 5 gallons of gasoline for the first few hours of running. Be sure that it is mixed thoroughly in the tank.

During the entire life of the engine, always run the engine at medium speeds for a few minutes to allow the oil to warm up before running at sustained high speeds.

When coming to the dock, after a run, always allow the engine to run at moderate speed for three to five minutes before turning off the ignition. This can be done by slowing down several hundred yards before you get to the dock and coming in slow or letting the engine idle after you have come into the dock. This is to allow the valves to cool down while the water is still circulating in the engine. This will prevent warped valves.



ENGINE LUBRICATION

For engines installed in Chris-Craft boats at the factory, the capacity of the engine lubricating system should be governed by the markings on the oil test rod as the angle of the engine determines the amount of oil to use.

The proper oil test rod markings can be determined from the above illustration after measuring the engine angle in the boat while running.

The engine is run on the test stand with a special rustproof break-in oil. Before shipping, this break-in oil is removed and replaced with SAE #30 Havoline motor oil.

TO CHANGE OIL

The oil should be changed after the first twenty five hours. Thereafter it should be changed every fifty to one hundred hours depending upon the type of service to which the engine is subjected. An engine that is used for short runs needs changing more often than an engine that is run longer periods of time. Long runs permit the oil to get hot enough to evaporate any water that may have accumulated in the crankcase from condensation.

The recommended procedure is to pump the oil out of the crankcase with a suction pump through the oil test rod opening. Most service docks are equipped with special pumps for this purpose.

For the owner who wishes to change the oil himself a piece of copper tubing or a hand suction pump may be used.

When a piece of copper tubing is used, the line going to the oil pressure gauge should be unscrewed from the fitting where it comes out of the block below the ignition coil and the piece of copper tubing should be attached to this fitting. Put the end of this tube in a pail and idle the engine slowly pumping the oil out of the crankcase. Do not speed up the engine. Watch closely and stop the engine as soon as the oil stops running out of the tube. This does not take out sludge below the screen or remove the oil in the reverse gear.

When a hand suction pump is used, the oil is pumped out of the crankcase through the oil test rod opening. By removing the inspection cover on top of the reverse gear housing the oil may be pumped out of this unit also. On reduction gear models there will remain from 1 to 1-1/2 quarts in that unit that cannot be removed. A suitable hand suction pump may be purchased as an accessory from the Chris-Craft Parts and Accessory Department.

RECOMMENDED LUBRICANT

We are primarily interested in seeing that every Chris-Craft is serviced with oil of good character and quality, because the use of such oil means not only dollars in the owner's pocket but smooth engine operation, freedom from trouble, and maximum engine performance. A marine engine works at maximum capacity 90% of its lifetime, whereas in an automobile, the engine rarely, if ever, works at its maximum more than 10% or 15% of its lifetime. Hence, the demands on the oil are far greater in a marine engine.

We recommend the use of a detergent oil with additives to U. S. Military Spec. MIL-L-2104-A (or Supplement #1) or I. C. E. I. "A" or "B" or A. P. I. "MS" or "DG". A straight mineral oil of high quality may be used but we caution that the two types should never be mixed. To do so might cause the formation of sludge. Always replenish with the same make and type of oil that is in the crankcase. If it is necessary to change the make of oil, always drain the crankcase and make a complete change.

EXTRA GALLON OF OIL

The extra gallon of Havoline oil usually furnished with the engine is supplied with the compliments of the Texaco Company. If used for replenishment, be sure to replace it, for it is advisable to have an extra gallon of oil aboard the boat for emergency purposes.

AUTO-LITE ELECTRICAL INSTRUCTIONS

Auto-Lite equipment is guaranteed and serviced by the Electric Auto-Lite Company of Toledo, Ohio. This service is handled through their many Official Service Stations located in all of the more important cities throughout the world. A directory of these Official Service Stations will be furnished any Auto-Lite user by request addressed to the Part and Service Division, the Electric Auto-Lite Company, Toledo, Ohio.

General Care of the Electrical Equipment--

Most important in the care of the electrical equipment is the keeping of all connections not only clean and tight mechanically, but free from all corrosion. Brass and copper connections in a boat operated around salt water are especially subject to corrosion and they should be taken apart two or three times a year, cleaned with fine sandpaper, given a light coating of vaseline and reconnected, being sure they are tight.

Battery terminals should be given special attention and much trouble and annoyance can be avoided if they are periodically taken apart and washed in a strong ammonia or soda solution, given a light coating of vaseline and reassembled, being sure they are tight.

When replacing worn parts only genuine Auto-Lite service parts should be used. While the market affords numerous imitation parts there is no assurance that these are built of the same carefully selected material or are subject to the same exacting inspection as the genuine parts. Therefore, in order to insure yourself the longest possible life of the electrical equipment only genuine Auto-Lite parts should be used.

Generator--

The generator output should never be set above the maximum output as noted on the name plate. All wiring and connections should be tight and the proper size as high resistance in the charging circuit will cause an over voltage that materially shortens the life of lamps or other electrical equipment. The owner should not attempt to repair or adjust the circuit breaker or regulator as these operations should only be handled by an Official Service Station which is equipped with the proper tools and information to correctly repair these units.

Starting Motor--

The starting motor requires no special attention except to see that it is mounted securely and that the Bendix is free from dirt. There should be no voltage loss in the starting circuit and switch as a reduced voltage reduces the cranking power of the motor.

Distributor--

The distributor should be kept free from dirt and properly lubricated. The drain hole in the bottom of the housing should be kept open. Breaker point rubbing blocks are run in at the factory and can be set for proper maximum gap of .022 inch without any run in period. If the points in use show a grayish color, are only slightly pitted and are within .002 inch of the proper maximum gap they need not be replaced or adjusted. However, before adjusting the points they should first be refaced so as to have a smooth flat contact with each other.

The ignition coil is sealed against moisture and needs no attention except to see that the connections are tight.

Lubrication--

Approximately every 50 hours or when the oil is changed the following points should be lubricated with a medium engine oil:

1. The oilers in each end of the generator should be given 3 to 5 drops.

2. The intermediate oiler, if provided, and the commutator end oiler in the starting motor should be given 3 drops.
3. The oiler on the outside of the distributor housing should be given 3 to 5 drops

Every season the distributor cap and rotor should be removed and one drop of light oil put on the breaker arm hinge pin, a light wipe of grease on the cam and a few drops of light oil added to the hole in the top of the distributor drive shaft.

IGNITION

The surfaces of the contact points should be clean and free from rough pittings and grease. After 500 hours running of the boat it may be necessary to reface these contacts, or to install a new set. The same applies to spark plugs, and when the points become worn and corroded new plugs should be installed. It is important that only the correct type of plug be used in this motor. See page on Specifications and Adjustments.

To set the ignition timing use a timing light. The flywheel is provided with a timing mark on its rim and an ignition timing indicator is positioned over the flywheel ring gear. With the timing light connected to the battery and No. 1 spark plug (flywheel end) and the engine run at idle (see page on Useful Information) set the distributor so that the timing light shows the flywheel timing mark directly in line with the ignition timing indicator.

To set the ignition timing on engines which do not have timing marks, run the boat at its maximum speed and advance the spark until it starts to rattle. At this point speed will drop off, indicating detonation. Then retard it just enough to make the engine run smoothly without any rattle or spark knock. Do not attempt to set the spark with the reverse gear in neutral.

Recheck ignition timing after tightening the distributor to be sure that it is properly set.

For marking engines not previously provided with timing marks see your Chris-Craft Dealer or write

direct to the factory for a quotation on the distributor and instructions necessary.

CARBURETOR

The carburetor is guaranteed and serviced by the Zenith-Detroit Corporation, Foot of Hart Avenue, Detroit, Michigan.

Any service problem may be taken up with them or with the Chris-Craft Service Department.

ADJUSTMENT OF CARBURETOR

Carburetors which have a fixed main jet require no adjustment.

Carburetors with adjustable main jets should be adjusted as follows. Screw the needle valve all the way in, then back it out about two and one-quarter turns. This should make it just a trifle too rich. Run the boat at full throttle and screw the needle valve in until the speed starts to drop off. (Watch the tachometer closely.) Then unscrew it until the engine runs at highest speed. The approximate setting is about two full turns. A too lean mixture will cause pre-ignition and burned valves. It is better to run a little on the rich side.

The idling jet should be set to run the engine at its smoothest.

Carburetors with adjustable main jets can be changed over to fixed main jets quite easily. For further information see your Chris-Craft Dealer or write Chris-Craft Service Department at Algonac, Michigan.

FUEL PUMP

Service on the AC Fuel Pump is available through United Motors Service Branches and authorized AC Service Stations which are prepared with parts and fixtures for repairing all types of pumps.

Any service problem may be taken up with them or with the Chris-Craft Service Department.

CARE OF WATER PUMP

The Water Pump is equipped with a water seal that is automatic in its action. When leaks occur, this seal may be replaced. No lubrication is required.

ADJUSTMENT OF VALVES

It is not possible to put a final adjustment on the valves at the factory that will last the entire season. After a few hours running the boat should be taken back to the dealer and the valves readjusted. Loss of engine speed and increase in gasoline consumption is the first indication for the need for grinding valves. An engine that is driven at sustained high speeds will need valve grinding much oftener than one that is used at normal speeds.

REVERSE GEAR

Important Recommendation --

It is not recommended that the boat be run at the dock with the reverse gear in the neutral position (except on engines equipped with Chris-Craft Chris-O-Matic clutch controls). Space here will not permit a detailed diagram on the construction and operation of a reverse gear but let it suffice to say that when the reverse gear is in the neutral position it compares to an automobile when the clutch pedal is pushed to the floor.

If you wish to warm up the engine at the dock put the nose of the boat against the dock and put the lever in the go-ahead position and run the engine slowly.

If you are familiar with the reverse operation of the gear you will know that in reversing, the reverse band is clamped firmly to the clutch drum. Therefore, it is important that the reverse lever be pulled back firmly so that the band will not slip on the drum. Pull the lever back and hold it there as long as you want to reverse and control the speed by the throttle and not by allowing the band to slip. It is not intended that the reverse gear be used as a brake.

Adjustments--

It is necessary that your reverse gear be properly adjusted before you operate it. The forward drive is obtained by means of a multiple disc clutch. The locking or clamping of these discs is brought about by the pressure produced by the outward movement of the fingers when the operating lever is thrown into the forward position. On the forward drive the whole reverse gear is locked together as a solid coupling. Unless the pressure on these discs is great enough to lock the whole reverse gear together under full load, the clutch will slip and heat.

The reverse drive is obtained by clamping the brake band around the outside drum or case which carries the pinion gears. The reverse motion is then obtained by driving through the gears. Unless this band is clamped tight enough to keep this gear cage from revolving, it will slip in the reverse position.

In neutral position, both the discs and brake band are free and the gears run idle.

Adjustment for the Forward Drive --

(See Reverse Gear illustration at back of book)

If the gear slips in the forward drive back out the lock screw No. 76 until the end of it is clear of the hole in the pressure disc No. 11. Then turn the adjusting finger collar No. 28 to the right until the lock screw No. 76 is opposite one of the holes in the pressure disc No. 11.

Then tighten up the lock screw No. 76 and be sure that end of the screw enters the hole in the pressure disc No. 11. Repeat this procedure until the reverse gear holds on the forward drive. An adjustment of one or two holes is usually sufficient.

Adjustment for Reverse Drive --

with Toggle Clamping Mechanism (Fig. 1)

In the reverse position the brake band is supposed to grip and hold the gear cage or drum from turning. If this drum slips, it is necessary to tighten the adjustment of the brake band, which adjustment is made as follows:

Loosen the locknut No. 429 on the inside of the

upright lug at the top of the brake band to the amount you think the brake band needs adjusting. Then tighten the adjusting nut No. 431 on the outside of this lug until it is again tight against this lug. Repeat until the brake band grips the gear cage and keeps it from revolving.

The adjustment should be tight enough so that a decided snap is felt when the lever is thrown into the reverse position.

Adjustment for Reverse Drive (Fig. 2)

with Cam Clamping Mechanism

Throw the lever into the reverse position with the engine turning over slowly. Then tighten up the adjusting bolt No. 330 until the brake band clamps or grips the case or gear cage No. 1 and holds it from revolving. It is well to screw up this adjusting bolt No. 330 a little tighter than necessary. This will compensate for any wear on the brake band. The lock spring No. 331 holds the adjusting bolt nut and keeps it from loosening.

ENGINE ALIGNMENT

Many cases of excessive vibration, reverse or reduction gear noise, and loss of revolutions, are caused by engine misalignment. This alignment is checked by disconnecting the two halves of the shaft coupling just aft of the reverse or reduction gear. The faces of these flanges must be within .003 parallel in all directions. The engine is mounted on taper shims to facilitate this adjustment. For further information refer to the paragraph on this subject in the Boat Owner's Manual.

ENGINE KNOCKS AND LOSS OF REVOLUTION

A sudden and otherwise inexplicable drop in revolutions, a new and disturbing period of vibration, and a sudden loss of speed without other apparent cause, are usually definite symptoms of propeller wheel disorders even though the propeller wheel itself looks to be undamaged.

Never attempt to judge the condition of a propeller

from its appearance. Though undamaged to the naked eye it may show startling pitch discrepancies when subjected to careful measurements with proper instruments. It is not necessary to run aground or become entangled with drift in order to throw a propeller out of pitch. Especially in the case of high-speed, high-power runabouts, loss of pitch will occur in the course of normal operation. A sudden turn at high speed, or bucking a heavy sea is often sufficient to submit one or more of the blades to a sudden shock or load beyond their normal ability to withstand, resulting in a propeller which, though not perceptibly damaged, is sufficiently "out of pitch" to account for several hundred lost RPM... on the tachometer or set up a serious vibration period.

Engine knocks are usually caused by faulty lubrication, and if you take proper care of the oiling of your motor you will probably never hear a knock.

Knocks which start suddenly and rapidly get louder are dangerous. Stop motor and investigate oil supply and water circulation, including water intake. Do not run motor with a loose bearing.

Knocks which begin faintly and increase slowly if at all are not immediately dangerous, but should be investigated by a mechanic or your Chris-Craft dealer as soon as possible.

If you are caught off shore with a burned out rod bearing due to lack of oil in the crankcase and must run the motor in order to get to land, removing spark plug in the bad cylinder is your best chance. Run slowly.

MISFIRING

The most frequent causes of misfiring are as follows: (It is entirely unlikely that you will be troubled with any of these things, but it is well to know what to do in case of emergency): 1--Dirty or cracked plugs; remedy--install new ones or clean them. 2--Intermittent electric leak somewhere in the wiring; remedy trace and insulate. 3--Stuck valve, or broken valve spring. Remove valve cover plate and inspect valve

mechanism; remedy--new spring or grinding valves, or both. 4--Valve tappets too close. At high speed close - set tappets will ride the cams, prevent the valves from closing, and thus cause misfiring; remedy adjust tappets. See page on Specifications & Adjustments for clearances. 5--Breaker points out of adjustment; when a motor misses at low speeds only, inspect breaker points first. 6--Water in one or more cylinders due to blown gaskets or crack in water jacket. 7--Blown or leaky gaskets, either in manifold or cylinder head. 8--Loose spark plugs. 9--Too high oil level, causing sooty plugs.

IMPORTANT NOTICE

Form the habit of watching the oil pressure gauge. This gauge is sometimes called the "watch dog" of the engine. Advance notice of serious trouble is nearly always given by the oil gauge.

If the pressure suddenly drops off, stop the engine immediately and do not run it until the trouble is located and remedied. See if there is plenty of oil in the crankcase. An oil line may be broken or the gauge broken--Try a new gauge first. If the oil pressure suddenly goes too high look for a plugged oil line or the relief valve may be stuck. If the oil pressure falls off gradually, the oil may be worn out or diluted with gasoline. If you have plenty of pressure when the engine is cold and drops off when hot you may not be using an oil suitable for marine use. See Page 3 for Recommended Lubricant.

If you have very low pressure when the engine is cold and near normal when hot, or if the pressure drops below recommendation when running hard (see section on Useful Information) check for a clogged oil screen. This screen is accessible through the hand-hole cover on the side of the oil pan and should be cleaned once every season.

Do not change the oil pressure regulating valve to compensate for sudden changes in oil pressure or to compensate for the incorrect grade of oil.

USEFUL INFORMATION

Engine

Type -- L-Head, vertical

Cylinders -- 6

Bore -- 3-7/16"

Stroke -- 4-1/8"

Brake Horsepower -- Model K-KR-KS 95 at 3200 RPM

Piston Displacement -- 229.7 cu. in.

Compression Ratio -- 7.35:1

Weight -- K 626 lbs. -KS 676 lbs. -KR 710 lbs.

Electrical System

Battery -- 6 volt

Generator Charging Rate -- 14 to 19 Amps Max.

Generator Cuts in at 800 Engine RPM

Oiling System

5 pounds (minimum) - idling speed

20 to 35 pounds - maximum speed, hot

Recommended Idling Speed

K-500 RPM - KB-750 RPM

TO DRAIN THE WATER SYSTEM

Open drain cock on side of cylinder block behind the water pump. Remove plug at bottom of water pump and plug in water line tee in bottom of exhaust manifold. Also remove plug in the oil cooler bracket.

USE ONLY CHRIS-CRAFT PARTS

Genuine Chris-Craft parts are identified by this label:



or the name *Chris Craft* cast in the casting.

SPECIFICATIONS AND ADJUSTMENTS

Valve Clearance - Engine Cold

Exhaust Valve -- .012

Intake Valve -- .010

Valve Seat

Exhaust -- Diam. 1-1/4" Face 3/32" Angle 30°

Intake -- Diam. 1-1/2" Face 3/32" Angle 30°

Valve Guide Clearance

Exhaust -- .0025 to .003

Intake -- .0025 to .003

Tappet Guide Clearance -- .0007 to .0015

Idler Shaft Clearance -- .00075 to .001

Idler Gear back lash to Camshaft -- .001 to .002

Camshaft Bearing Clearance -- .0015 to .0025

Camshaft Gear back lash to Crankshaft-- .000 to .002

Crankshaft Main Brng. Clearance -- .0015 to .003

Crankshaft Thrust Clearance -- .002 to .004

Conn. Rod Brng. Clearance -- .001 to .003

Conn. Rod Side Clearance -- .005 to .010

Accessory Shaft Clearance -- .0015 to .0025

Accessory Gear back lash to Idler Gear-- .002 to .004

Accessory Shaft End Thrust -- .002 to .003

Oil Pump Gear back lash to Camshaft -- .008 to .010

Dist. Drive Gear back lash to Dist. Driven Gear-- .003 to .008

Piston Clearance (at skirt) -- .004 to .0045

Piston Pin Clearance in Piston - Hand Push Fit

Piston Ring Gap -- .015 to .020

Piston Ring Side Clearance--

Top Groove -- .003 to .0045

2nd & 3rd Groove -- .0015 to .003

Distributor Point Gap -- .022

Spark Plug -- J8J Gap -- .028

Firing Order--

Standard Rotation -1-5-3-6-2-4

Opposite Rotation -1-4-2-6-3-5

PARTS LIST
CHRIS-CRAFT MARINE MOTOR

Model K

See Pg. 37 for KB racing engine

See your Chris-Craft Dealer or Write Direct to
Factory for Prices

Part No.	No. Reqd.	Name
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**CYLINDER AND CRANKCASE AND
STRIPPED ENGINE ASSEMBLIES**

47347AS	1	Cylinder and Crankcase Only - with Valve Guides, Camshaft Bushings and Idler Gear Bushing - 3-7/16" Bore
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Note: It will be necessary to also purchase a full set of 12 Part No. 38021AS Self Locking Valve Tappet Assy. when replacing any Cylinder and Crankcase having a block number lower than #792548 Std. Rot. #793164 Opp. Rot.

3554	1	K Stripped Engine Assy. with Valves, Pistons, Crankshaft, Camshaft and Connecting Rods - Std. Rot. 3-7/16" Bore
3556	1	KO Stripped Engine Assy. with Valves, Pistons, Crankshaft, Camshaft and Connecting Rods - Opp. Rot. 3-7/16" Bore
14398A	1	Cylinder Drain Cock
7239A	8	Expansion Plug 1-1/2" Brass
60A	1	Oil Passage Pipe Plug 1/4" Slotted
59A	8	Oil Passage Pipe Plug 1/8" Slotted
3201A	1	Oil Passage Pipe Plug -1/4" Special
1702	1	Water Jacket Plate (Coil Mount)
13995	1	Water Jacket Plate Gasket
1687	1	Water Jacket Plate-Small
1688	1	Water Jacket Plate Gasket - Small
46069A	4	Valve Compartment Plug

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
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MAIN BEARINGS

Used Before Block No. 749308

14126	1	Set Main Bearings-Std. Consist of: 2--42693 B Front Bearings Upper and Lower 2--46694 B Center Bearings Upper and Lower 2--46695 B Rear Bearings Upper and Lower 8--42696 B Intermediate Bearings Upper and Lower
14127	1	Set Main Bearings - .002 U.S.
14128	1	Set Main Bearings - .010 U.S.
14129	1	Set Main Bearings - .020 U.S.

Used After Block No. 749307

14138	1	Set Main Bearings-Std. Consist of: 2--43598 B Front Bearings Upper and Lower 2--43601 B Center Bearings Upper and Lower 2--47093 B Rear Bearings Upper and Lower 8--43600 B Intermediate Bearings Upper and Lower
14139	1	Set Main Bearings - .002 U.S.
14140	1	Set Main Bearings - .010 U.S.
14141	1	Set Main Bearings - .020 U.S.
42540B	4	Front Main Bearing Thrust Washer
40554A	4	Front Main Bearing Thrust Washer Pins
Note: Main Bearing Thrust Washers are not included in the sets. They must be ordered as a separate item.		
40070A	10	Main Bearing Cap Screw - Front and Intermediate 1/2" x 2"
40071A	8	Main Bearing Cap Screw - Center and Rear 7/16" x 2"

Be Sure To Give Engine Number When Ordering Parts

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Part No.	No.	Name
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MAIN BEARINGS (Cont'd)

4731A	10	Main Bearing Cap Screw Lockwasher 1/2"
4732A	8	Main Bearing Cap Screw Lockwasher 7/16"

GASKET SET

3256	1	Set of Gaskets - Complete
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CONNECTING ROD

47091AS	6	Conn. Rod Assembly (with Bearing)
46156A	12	Conn. Rod Bolt
6331A	12	Conn. Rod Bolt Nut
301A	12	Conn. Rod Bolt Nut Cotter Pin (3/32" x 3/4")
46111A	6	Conn. Rod Clamp Screw (Holds Pin)
14842A	6	Conn. Rod Clamp Screw Lockwasher
46154A	When	Conn. Rod Shim .003
46167A	Reqd.	Conn. Rod Shim .002
14182	12	Conn. Rod Bearing-Std. (47104-B)
14183	12	Conn. Rod Bearing-.002 U. S.
14185	12	Conn. Rod Bearing-.010 U. S.
14186	12	Conn. Rod Bearing-.020 U. S.

PISTONS AND RINGS

Used After Block No. 723999

And Before Block No. 731167

46345C	6	Pistons 3-7/16" Dia. Std. Rot.
46344C	6	Pistons 3-7/16" Dia. Opp. Rot.
46022B	6	Piston Pin
3526	1	Set Piston Rings-Std.
3526-B	1	Set Piston Rings-.020 O. S.
3526-C	1	Set Piston Rings-.030 O. S.

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
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PISTONS AND RINGS (Cont'd)

Used After Block No 731166

46258C	6	Pistons 3-7/16" Dia. Std. Rot. (3 ring)
46259C	6	Pistons 3-7/16 Dia. Opp. Rot. (3 ring)
3528	1	Set Piston Rings-Std.
3528-B	1	Set Piston Rings-.020 O. S.
3528-C	1	Set Piston Rings-.030 O. S.

CRANKSHAFT

46828B	1	Crankshaft
47045B	1	Crankshaft Gear - Std. Rot.
47046B	1	Crankshaft Gear - Opp. Rot.
4413A	1	Crankshaft Gear Key

VALVES

47017B	6	Intake Valves
47028B	6	Exhaust Valves
47018A	12	Valve Guide
46043A	12	Valve Spring
46013A	12	Valve Spring Seat
46011A	24	Valve Spring Seat Lock
46007B	1	Valve Cover Aft
1694	1	Valve Cover and Fume Tube Assy.
3402	4	Valve Cover Screw Gasket
4337A	4	Valve Cover Screw 3/8" - 16 x 2"
46008A	2	Valve Cover Gasket

VALVE TAPPET

Used Before the Following Block Numbers:

		Std. Rot. 792548 Opp. Rot. 793163
38010AS	12	Valve Tappet Assembly
46019A	12	Valve Tappet Adjusting Screw
14974A	12	Valve Tappet Screw Nut
46089A	12	Valve Tappet Guide

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
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VALVE TAPPET (Cont'd)

Used After the Following Block Numbers:

		Std. Rot. 792547 Opp. Rot. 793163
38021AS	12	Valve Tappet and Self Locking Screw Assy.
47015A	12	Valve Tappet Guide

CYLINDER HEAD

3656	1	Cylinder Head-Cast Iron 95 HP
	Note:	Used after Engine No.23760. Service earlier engines with 3656 head and new studs.
46372C	1	Cylinder Head Gasket
3668	22	Cylinder Head Studs
3574	2	Capscrews 1/2" - 13 x 3"
3374	24	Cylinder Head Stud Plain Washer
3286	22	Cylinder Head Stud Nut 1/2"--20
3688	3	Cylinder Head Expansion Plugs 1-1/8"
4312A	1	Cylinder Head Plug 1/2"

LIFTING EYE

1662	1	Engine Lifting Eye
	1	Engine Lifting Eye Lockwasher 9/16"

SUPPORT BRACKETS

1613	1	Engine Front Support Bracket
1685	1	Engine Front Support Bracket to Cylinder Gasket
5122	2	Dowel Capscrew
1624	1	Engine Rear Support Bracket
1627	1	Engine Rear Support Bracket Gasket
1777	2	Engine Rear Support Dowel Bushing
1674	4	Engine Support Bracket (On Keelson)
1430	4	Engine Rubber Mounting

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
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SUPPORT BRACKETS (Cont'd)

2277	3	Gear Train Thrust Screw (On Front Support Bracket)
2048A	3	Gear Train Thrust Screw Locknut
5166	1	Ignition Timing Indicator

CAMSHAFT

46814D	1	Camshaft - With Plunger Std. Rot.
46816D	1	Camshaft - With Plunger Opp. Rot.
46041A	2	Camshaft Bearing - Front and Rear
46044A	2	Camshaft Bearing - Center
46049B	1	Camshaft Gear - Std. Rot.
46050B	1	Camshaft Gear. - Opp. Rot.
4265A	1	Camshaft Gear Key
46045A	1	Camshaft Thrust Washer
40068A	1	Camshaft Thrust Plunger

IDLER GEAR

46138B	1	Idler Gear - Std. Rot.
46141B	1	Idler Gear - Opp. Rot.
46139A	1	Idler Gear Shaft - With Plunger
22107A	1	Idler Gear Thrust Washer
46140A	1	Idler Gear Shaft Bearing
40068A	1	Idler Gear Shaft Plunger

ACCESSORY DRIVE

47072BS	1	Acc. Drive Assembly Std. Rot.
47074BS	1	Acc. Drive Assembly Opp. Rot.
46195B	1	Acc. Drive Gear Std. Rot.
46077B	1	Acc. Drive Gear Opp. Rot.
4413A	1	Acc. Drive Gear Key
27072A	1	Acc. Drive Shaft
27257A	1	Acc. Drive Bushing
46170A	1	Acc. Drive Attaching Gasket
1864A	1	Acc. Drive Attaching Screw 3/8"x1"

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
ACCESSORY DRIVE (Cont'd)		
682A	2	Acc. Drive Attaching Screw 3/8"x2-3/4"
342A	3	Acc. Drive Screw Lockwasher 3/8"
40068A	1	Acc. Drive Thrust Plunger
4024A	1	Acc. Drive Thrust Washer
47073C	1	Acc. Drive Housing
22336A	1	Acc. Drive Driving Gear - Std. Rot.
27073A	1	Acc. Drive Dist. Driving Gear Opp. Rot.
1179A	1	Acc. Drive Dist. Driving Gear Key
300A	1	Acc. Drive Dist. Clamp Nut
8051A	1	Acc. Drive Dist. Clamp Screw

FLYWHEEL

1900	1	Flywheel With Ring Gear Std. Rot.
14003	1	Flywheel With Ring Gear Opp. Rot.
22104A	4	Flywheel Bolt
1609	4	Flywheel Bolt Nut
5116	2	Crankshaft Flywheel Dowel
4642A	1	Flywheel Positioning Dowel
1562	1	Flywheel Ring Gear - Std. Rot.
1563	1	Flywheel Ring Gear - Opp. Rot.
1434	1	Starting Crank - Cruiser (Long)
1488	1	Starting Crank - Runabout (Short)

OIL PAN

1612	1	Oil Pan (Single Screw Std. and all Opp. Rot.)
1913	1	Oil Pan (Twin Screw Std. Rot.)
1737	1	Oil Pan Handhole Cover (Used with 1913 Oil Pan)
1626	2	Oil Pan Gaskets
2011	1	Oil Strainer Body and Screen
1639	1	Oil Strainer to Pump Flexible Tube Assembly
3570	1	Tube Elbow Fitting 3/4"-16x3/8" FPT
4312A	1	Oil Drain Plug-1/2" Square Head

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
OIL FILLER		
1611	1	Oil Filler and Inspection Plate (For 1612 Pan)
1610	1	Oil Filler and Inspection Plate Gasket (For 1612 Pan)
1914	1	Oil Filler and Inspection Plate (For 1913 Pan)
1915	1	Oil Filler and Inspection Plate Gasket (For 1913 Pan)
5156	1	Oil Filler Cap and Test Rod
Note: This assembly becomes #4184 when marked for an engine with a running angle of 5° to 15° and #4186 for 16° to 24°. - (See page 2).		

OIL PUMP

43366CS	1	Oil Pump Assembly - Std. Rot.
43367CS	1	Oil Pump Assembly - Opp. Rot.
22119A	1	Oil Pump Attaching Gasket

OIL PRESSURE REGULATING PARTS

22129A	1	Oil Pressure Regulating Plunger
1347A	1	Oil Pressure Regulating Spring
1385A	1	Oil Pressure Regulating Spring Cap
2058A	1	Oil Pressure Regulating Adj. Screw
1660A	1	Oil Pressure Regulating Adj. Screw Nut
28A	1	Oil Pressure Regulating Adj. Screw Locknut

MANIFOLD

3692	1	Exhaust and Intake Manifold
13996	1	Exhaust and Intake Manifold Gasket
1406	6	Manifold Stud - Short
1661	2	Manifold Stud - Long

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
MANIFOLD (Cont'd)		
4732A	8	Stud Lockwasher 7/16"
3276	8	Stud Nut 7/16"-20
1602	1	Manifold End Cover
1603	1	Manifold End Cover Gasket
3198	1	Manifold Drain Plug 1/2" MPT
3688	6	Expansion Plugs 1-1/8" Brass
3580	4	Expansion Plugs 1/2" Brass
EXHAUST ELBOW		
1603	1	Exhaust Elbow Gasket
1643	1	Exhaust Elbow Assy. - Vert. Down
5070	1	Exhaust Elbow Assy. - Vert. Down
1644	1	Exhaust Elbow Assy. - Horiz. to Port
1645	1	Exhaust Elbow Assy. - Twist Down 45° to Port
13999	1	Exhaust Elbow Assy. - Horiz. to Stbd. (1683)
3886	1	Adjustable Exhaust Elbow Assy. (For KSO Engine only in 33' Del. Enclosed)
3888	1	Adjustable Exhaust Elbow Assy. (For KS Engine only in 33' Del. Enclosed)
1864A	4	Exhaust Elbow Capscrew 3/8"-16x1"
342A	4	Exhaust Elbow Lockwasher 3/8"
1748	1	Exhaust Flange-For 2" Threaded Pipe
4337A	4	Exhaust Flange Capscrew 3/8"-16x2-1/4"
342A	4	Exhaust Flange Lockwasher 3/8"
Note:		Exhaust Elbow Assemblies may be ordered in either brass or cast iron (except 3886 and 3888 which are available in iron only)

CYLINDER HEAD TO EXHAUST ELBOW
WATER LINES

1646	1	Water Tube for 1643, 5070, 1645, and 1644 Elbows
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Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
CYLINDER HEAD TO EXHAUST ELBOW WATER LINES (Cont'd)		
1684	1	Water Tube for 1683 Elbow
3916	1	Water Tube for 3886 and 3888 Elbow
1652	1	Packing Gland for Water Tube
1672	1	Water Tube Elbow At Cylinder Head 1/2" MPT x 3/4" Tube
13186		Asbestos Packing - Order by Foot

CARBURETOR

(Order detail parts direct from mfg.)		
3206	1	Carburetor Assy. (Zenith Outline 8983)
1458	1	Carburetor Attaching Gasket
1821	2	Carburetor Stud
1539	1	Carburetor Flame Arrester (Zenith B-175-12)
12693	1	Carburetor Repair Kit (Zenith K-8983)

FUEL PUMP

(Order detail parts direct from mfg.)		
1559	1	Fuel Pump Assy. - AC 1539683
1462	1	Fuel Pump Gasket
3744	1	Fuel Pump to Carb. Fuel Line 5/16" x 13-1/2" MPT
13759	1	Straight Connector 5/16" Tube x 1/8" MPT
13774	1	Elbow Connector 5/16" Tube x 1/8" MPT
12689	1	Fuel Pump Repair Kit AC 1538579
13401	1	Reducing Street Elbow - 1/4" F x 1/8" M

ELECTRICAL EQUIPMENT

1540	1	Generator Auto-Lite GEO-4807 Std. Rot.
1552	1	Generator Auto-Lite GEO-4809 Opp. Rot. (Order Detail parts direct from mfg.)
1711	1	Generator Retaining Screw

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
ELECTRICAL EQUIPMENT (Cont'd)		
2003	1	Generator Pulley
1802	1	Generator Shaft Spacer Washer
1570	1	Generator Belt - 2MO-37
4234	1	Starting Motor Auto-Lite MCL 6004 Std. Rot.
4236	1	Starting Motor Auto-Lite MCL 6005 Opp. Rot. (Order detail parts direct from mfg.)
4342	1	Distributor Assy. Auto-Lite IAY-4009 Std. Rot.
4344	1	Distributor Assy. Auto-Lite IAY-4009 Opp. Rot. (Order detail parts direct from mfg.)
22335A	1	Distributor Driven Gear - Std. Rot.
27335A	1	Distributor Driven Gear - Opp. Rot.
3416	1	Distributor Driven Gear Pin
4343A	1	Distributor Spark Control Arm Brkt.
4266A	1	Distributor Spark Control Screw
342A	1	Distributor Spark Control Lockwasher
1530	1	Tachometer Fitting
3142	1	Set Screw 1/4"-20 x 5/8" Cup Point
1410	1	Distributor Shaft Packing Gland
3474	As Reqd.	Distributor Shaft Packing Gland Washer
1469	1	Ignition Coil Auto-Lite CR-6001
14002	1	Ignition Cable-Dist. to Coil - High Tension
1665	1	Ignition Cable-Dist. to Coil Low Tension
1650	4	Ignition Cable-Dist. to Spark Plugs Short
14021	2	Ignition Cable-Dist. to Spark Plugs Long
1470	6	Spark Plugs-Champion J-8-J
5126	1	Ignition Cable Bracket - (Small)
5128	1	Ignition Cable Bracket - (Large)
1869	6	Ignition Wire Conduit Grommet
11000	1	Solenoide Starter Switch

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
WATER PUMP		
4274	1	Water Pump Assembly
3362	1	Water Pump Drain Plug - 1/8" Hex Head Brass
4408	1	Water Pump Attaching Gasket
	Note:	(When ordering detailed pump parts furnish the number found stamped on the machined face of the pump attaching flange. We do not recommend new gears being installed in housings that are old and worn.)
WATER PUMP FITTINGS		
	3	Street Elbow 1/2" - 90°
	1	Close Nipple 1/2"
	1	Manifold Tee 1/2"
1671	3	Hose Nipple 1/2" x 2"
14087	1	Hose-Water Pump to Oil Cooler 3/4" ID-3 ply x 7"
14087	1	Hose-Oil Cooler to Manifold 3/4" ID-3 ply x 10"
OIL COOLER - RV-20		
1548	1	Oil Cooler - without base
1756	1	Oil Cooler Bracket (RDB Gear Only)
1755	1	Oil Cooler Bracket (Direct Drive and RA Gears)
3402	1	Oil Cooler Stud Gasket (500E)
3254	2	Oil Cooler Cap Gaskets
1770	1	Oil Cooler Stud
1551	1	Oil Pump Delivery Oil Line (7/16" O.D. x 9-5/8")
13790	1	Marine Elbow (7/16" Tube x 1/4" MPT for connection at Oil Pump Cover)
13791	4	Straight Marine Connectors (7/16" Tube x 1/4" MPT 2 used at Oil Cooler 2 used at Block)

Be Sure To Give Engine Number When Ordering Parts

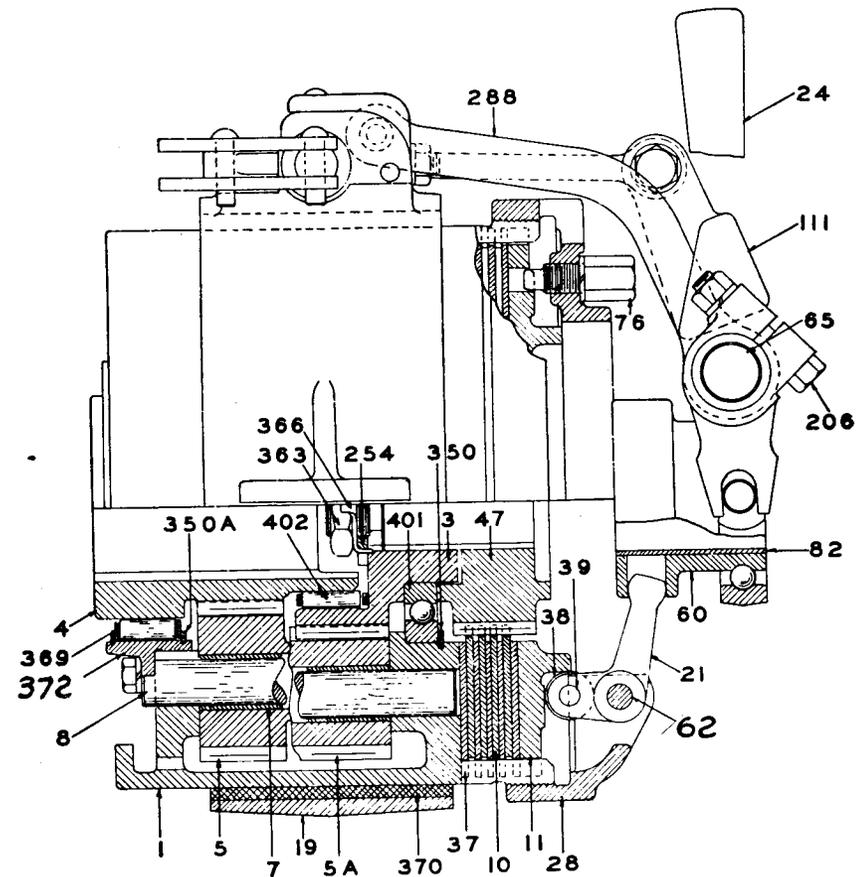
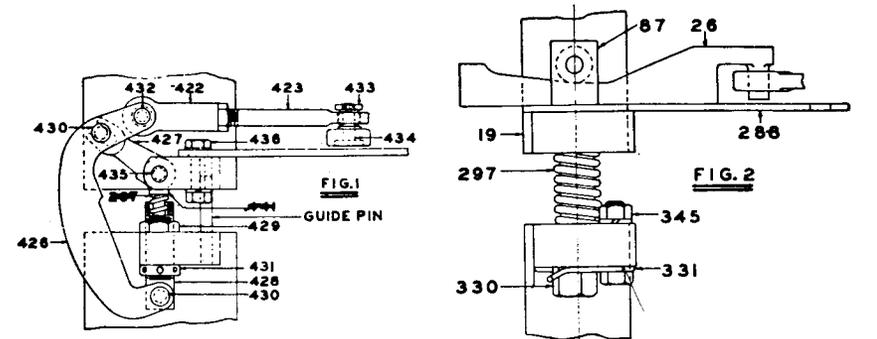
Part No.	No. Reqd.	Name
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OIL COOLER - RV-20 (Cont'd)

1818	1	Oil Line-Cooler to Tee on Cyl. Block
1819	1	Oil Line-Cyl. Block to Oil Cooler
1664	1	Tee-Special (Oil Cooler To Cylinder Block Oil Line) (Used before Engine 50678)
1772	1	Tee-Special (Oil Cooler to Cylinder Block Oil Line) (Used after Engine 50677)
3362	1	Pipe Plug - 1/8" Brass
3364	1	Acorn Nut 3/8" -- 24 Steel

REVERSE GEAR - DIRECT DRIVE (1XE-90)

19043	1	Engine Gear	(1XE-4Q)
13801	1	Engine Gear Key. (Woodruff #127)	
1635	1	Engine Gear Screw	
312A	1	1/2" Lockwasher	
19080	1	Pilot Roller Bearing	(1XE-402)
19040	1	Gear Cage or Drum	(1XE-1A)
19079	1	Gear Cage Front Bushing	(1XE-372A)
19021	1	Gear Cage Ball Bearing	(OXK-401)
19327	1	Bearing Retaining Ring	(RDA-350A)
19047	4	Pinion Stud	(1XE-8A)
19044	2	Pinion Gear-Short	(1XE-5)
19045	2	Pinion Gear-Long	(1XE-5A)
19073	2	Pinion Spacer	(1XE-327)
19046	6	Pinion Bushing	(1XE-7A)
19041	1	Propeller Gear	(1XE-3B)
19056	1	Disc Driver	(1XE-47B)
19048	3	Friction Disc-Inside	(1XE-10B)
19055	4	Friction Disc-Outside	(1XE-37C)
19049	1	Pressure Plate	(1XE-11B)
19054	1	Adjusting Collar	(1XE-28)
19110	1	Adjusting Lockscrew	(2XE-76)
19052	3	Clutch Finger Assy.	(1XE-21)
19178	3	Finger Pin	(4X-62)



REVERSE GEAR
Numbers shown are key numbers only.
Refer to parts list for complete part number.

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
REVERSE GEAR-DIRECT DRIVE (1XE-90) (Cont'd)		

19108	1	Operating Sleeve-with Ball Bearing Throwout Collar (2XE-60B)
19406	1	Throwout Yoke (X-111D)
19062	2	Yoke Shaft (1XE-65)
3492	2	Yoke Shaft to Yoke Key (Woodruff #7)
13801	1	Yoke Shaft to Arm Key (Woodruff #127)
19408	1	Clutch Hand Lever (XS-24)
19078	1	Brake Band Lining Only (1XE-370)
19058	1	Stub Shaft (1XE-59M)
19076	1	Propeller Gear Nut (1XE-363)
19077	1	Propeller Gear Washer (1XE-366A)
19069	1	Thrust Washer (1XE-235)
1450	1	Thrust Bearing (6307)
1451	1	Rear Oil Seal
19326	1	Rear Oil Seal Retainer (RDA-225)
1416	1	Retainer Gasket
1452	2	Yoke Shaft Oil Seal
1615	1	Reverse Gear Housing
1621	1	Housing Gasket
1386	1	Reverse Gear Top Cover
1413	1	Top Cover Gasket
19068	1	Shaft Coupling-Engine Half (1XE-208)
19328	1	Shaft Coupling Nut (RDA-363)
19329	1	Shaft Coupling Washer (RDA-366)
*1401	1	Shaft Coupling-Shaft Half (Give Shaft Size)
1634	2	Stud-Housing to Block

*Note: When ordering shaft half couplings, the following Key Letters should be used in conjunction with the basic shaft half coupling number:

A-3/4"	E-1-1/4"	I-1-3/4"
B-7/8"	F-1-3/8"	J-1-7/8"
C-1"	G-1-1/2"	K-2"
D-1-1/8"	H-1-5/8"	

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
REVERSE GEAR-DIRECT DRIVE (1XE-90) (Cont'd)		

Following Parts Used with Cam Type Reverse Band (Spec. Z-5354) - All Engines Before #60201.

19050	1	Brake Band-Lined (1XE-19C)
19070	1	Brake Band Support (1XE-288)
19053	1	Brake Band Locking Bar (1XE-26A)
19407	1	Brake Band Adj. Bolt with Spring (X-330)

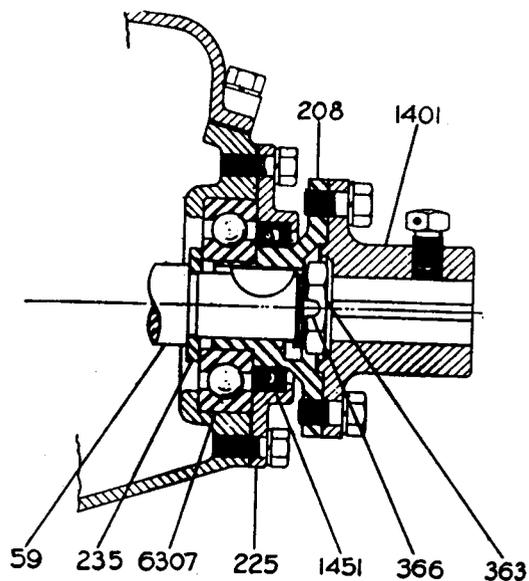
Following Parts Used with Toggle Type Reverse Band (Spec. Z-5853) - All Engines After #60200.

19051	1	Brake Band-Lined (1XE-19G)
19071	1	Brake Band Support (1XE-288B)
19163	1	Toggle Link-End (3XE-422)
19164	1	Toggle Link (3XE-423)
19166	1	Toggle Lever-Long (3XE-426)
19081	1	Toggle Lever-Short (1XE-427)
19169	1	Toggle Adjusting Bolt (3XE-428)
19170	1	Adj. Bolt Locknut (3XE-429)
19171	1	Toggle Pin-Long (3XE-430)
19172	1	Toggle Ball Joint (3XE-432)
19173	1	Yoke Ball Joint (3XE-433)
19082	1	Toggle Pin-Short (1XE-435)

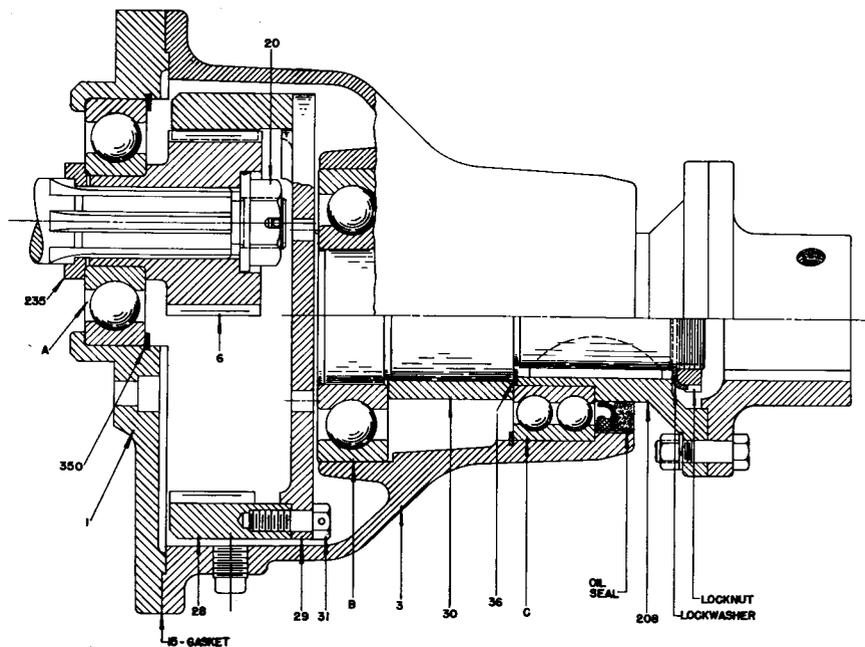
REVERSE GEAR-REDUCTION DRIVE-(2XE-90
Spec. Z-5477)

19087	1	Engine Gear (2XE-4L)
13801	1	Engine Gear Key (Woodruff #127)
1636	1	Engine Gear Screw
312A	1	1/2" Lockwasher
19123	1	Pilot Roller Bearing (2XE-402)
19084	1	Gear Cage or Drum (2XE-1A)
19120	1	Gear Cage Front Bushing (2XE-372B)
19122	1	Gear Cage Ball Bearing (2XE-401)

Be Sure To Give Engine Number When Ordering Parts



REVERSE GEAR - REAR END



REDUCTION GEAR

Part No.	No. Reqd.	Name
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REVERSE GEAR-REDUCTION DRIVE-(2XE-90)
(Cont'd)

19362	1	Bearing Retaining Ring (RDB-350A)
19093	4	Pinion Stud (2XE-8B)
19089	2	Pinion Gear-Short (2XE-5D)
19088	2	Pinion Gear-Long (2XE-5C)
19092	8	Pinion Bushing (2XE-7H)
19085	1	Propeller Gear (2XE-3B)
19104	1	Disc Driver (2XE-47B)
19094	3	Friction Disc-Inside (2XE-10B)
19103	4	Friction Disc-Outside (2XE-37D)
19095	1	Pressure Plate (2XE-11B)
19102	1	Adjusting Collar (2XE-28)
19110	1	Adjusting Lockscrew (2XE-76)
19098	3	Clutch Finger Assy. (2XE-21)
19178	3	Finger Pin (4X-62)
19108	1	Operating Sleeve-with Ball Bearing Throwout Collar (2XE-60B)
19127	1	Throwout Yoke (3XA-111)
19126	2	Yoke Shaft (3XA-65)
13976	2	Yoke Shaft to Yoke Key (Woodruff #11)
13801	1	Yoke Shaft to Arm Key (Woodruff #127)
19156	1	Brake Band Support (3XE-288A)
19105	1	Stub Shaft (2XE-59AB)
19116	1	Propeller Gear Nut (2XE-363)
19118	1	Propeller Gear Washer (2XE-366A)
1452	2	Yoke Shaft Oil Seal
2449	1	Reverse Gear Housing-1-1/2:1 Red. Before Eng. #63233
5042	1	Reverse Gear Housing-1-1/2:1 Red. After Eng. #63232
2279	1	Reverse Gear Housing-2:1 Red. Before Eng. #64150
5042	1	Reverse Gear Housing-2:1 Red. After Eng. #64149
1621	1	Housing Gasket
1619	1	Reverse Gear Top Cover
1620	1	Top Cover Gasket

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
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REVERSE GEAR-REDUCTION DRIVE-(2XE-90)
(Cont'd)

2280	2	Stud-Housing to Pan	
14042	2	Brake Band Support	
14043	2	Brake Band Support Pin	
19097	1	Brake Band-Lined	(2XE-19D)
19119	1	Brake Band Lining Only	(2XE-370)
19163	1	Toggle Link-End	(3XE-422)
19164	1	Toggle Link	(3XE-423)
19166	1	Toggle Lever-Long	(3XE-426)
19167	1	Toggle Lever-Short	(3XE-427A)
19169	1	Toggle Adjusting Bolt	(3XE-428)
19170	2	Adj. Bolt Locknut	(3XE-429)
19171	2	Toggle Pin-Long	(3XE-430)
19172	1	Toggle Ball Joint	(3XE-432)
19173	1	Yoke Ball Joint	(3XE-433)
19174	1	Ball Joint Screw	(3XE-434)
19175	1	Toggle Pin-Short	(3XE-435)
19176	1	Brace Screw	(3XE-436)

REDUCTION GEAR ASSEMBLY RA-20 (2:1) KR
(Spec. Y-5286) - Before Eng. #64150

19237	1	Red. Gear Housing	(RA20-3F)
19254	1	Housing Gasket	(RA20-15)
19250	1	Pinion Gear-Std. Rot.	(RA20-6)
19266	1	Pinion Gear-Opp. Rot.	(RA20-0-6)
19255	1	Ring Gear-Std. Rot.	(RA20-28)
19268	1	Ring Gear-Opp. Rot.	(RA20-0-28)
19256	1	Ring Gear Flange & Shaft	(RA20-29)
19258	8	Ring Gear Screws	(RA20-31)
19262	1	Thrust Washer	(RA20-235)
3172	1	Ball Bearing-Front 407 W (Key #A)	
3168	1	Ball Bearing-Center 310W (Key #B)	
3170	1	Ball Bearing-Rear 5211 G (Key #C)	
19263	1	Bearing Retaining Ring	(RA20-350)
19342	1	Pinion Gear Nut	(RDAA-20)
19257	1	Ball Bearing Spacer	(RA20-30)
19261	1	Oil Seal Retainer	(RA20-225)

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
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REDUCTION GEAR ASSEMBLY RA-20 (Cont'd)

19253	1	Retainer Gasket	(RA20-14)
3186	1	Rear Oil Seal	
19260	1	Shaft Coupling-Gear Half	(RA20-208)
3480	1	Coupling Key (Woodruff #TX)	
19228	1	Coupling Nut	(RA-NO7)
19229	1	Coupling Lockwasher	(RA-WO7)
19259	1	Cork Gasket	(RA20-36)
*2317	1	Shaft Coupling-Shaft Half	(Give Shaft Size)

REDUCTION GEAR ASSEMBLY RA-20 (2:1) KR
(Spec. Y-5244)-After Eng. #64149 and Before
#64761 Also some later single screw installations.

Same Parts as RA-20 Spec. Y-5286 but with the following parts added:

19249	1	Adapter Plate	(RA20-1D)
5086	1	Plate Gasket	

REDUCTION GEAR ASSEMBLY RA-20 (2:1) KR
(Spec. Z-6072)-After Eng. #64760 Except
some single screw installations.

19237	1	Red. Gear Housing	(RA20-3M)
19249	1	Adapter Plate	(RA20-1D)
5086	1	Adapter Plate Gasket	
19254	1	Housing Gasket	(RA20-15)
19250	1	Pinion Gear-Std. Rot.	(RA20-6)
19266	1	Pinion Gear-Opp. Rot.	(RA20-0-6)
19255	1	Ring Gear-Std. Rot.	(RA20-28)
19268	1	Ring Gear-Opp. Rot.	(RA20-0-28)
19256	1	Ring Gear Flange & Shaft	(RA20-29)
19258	8	Ring Gear Screws	(RA20-31)
19262	1	Thrust Washer	(RA20-235)

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
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REDUCTION GEAR ASSEMBLY RA-20 (Cont'd)

3172	1	Ball Bearing - Front 407W (Key #A)
3168	1	Ball Bearing - Center 310W (Key #B)
3170	1	Ball Bearing - Rear 5211 G (Key #C)
19263	2	Bearing Retaining Ring (RA20-350)
19342	1	Pinion Gear Nut (RDAA-20)
19257	1	Ball Bearing Spacer (RA20-30)
3186	1	Rear Oil Seal
19260	1	Shaft Coupling-Gear Half (RA20-208)
3480	1	Coupling Key (Woodruff #TX)
19228	1	Coupling Nut (RA-NO7)
19229	1	Coupling Lockwasher (RA-WO7)
19259	1	Cork Gasket (RA20-36)
*2317	1	Shaft Coupling-Shaft Half (Give Shaft Size)
19418	1	Snap Ring-Rear (RA20-350A)

REDUCTION GEAR ASSEMBLY RA-15 (1-1/2:1) KS
(Spec. Y-5302)- Before Eng. #63233

19237	1	Red. Gear Housing (RA20-3F)
19254	1	Housing Gasket (RA20-15)
19238	1	Pinion Gear-Std. Rot. (RA15-6A)
19239	1	Pinion Gear-Opp. Rot. (RA15-0-6A)
19255	1	Ring Gear-Std. Rot. (RA20-28)
19268	1	Ring Gear-Opp. Rot. (RA20-0-28)
19256	1	Ring Gear Flange & Shaft (RA20-29)
19258	8	Ring Gear Screws (RA20-31)
19262	1	Thrust Washer (RA20-235)
3172	1	Ball Bearing-Front 407W (Key #A)
3168	1	Ball Bearing-Center 310W (Key #B)
3170	1	Ball Bearing-Rear 5211G (Key #C)
19263	1	Bearing Retaining Ring (RA20-350)
19342	1	Pinion Gear Nut (RDAA-20)
19257	1	Ball Bearing Spacer (RA20-30)
19261	1	Oil Seal Retainer (RA20-225)
19253	1	Retainer Gasket (RA20-14)
3186	1	Rear Oil Seal

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
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REDUCTION GEAR ASSEMBLY RA-15 (Cont'd)

19260	1	Shaft Coupling-Gear Half (RA20-208)
3480	1	Coupling Key (Woodruff #TX)
19228	1	Coupling Nut (RA-NO7)
19229	1	Coupling Lockwasher (RA-WO7)
*2317	1	Shaft Coupling-Shaft Half (Give Shaft Size)
19259	1	Cork Gasket (RA20-36)

REDUCTION GEAR ASSEMBLY RA-15 (1-1/2:1) KS
(Spec. Y-5344)-After Eng. #63232

Same Parts as RA-15 Spec. Y-5302 but with the following parts added:

19235	1	Adapter Plate (RA15-1L)
5086	1	Plate Gasket

Be Sure To Give Engine Number When Ordering Parts

Part No.	No. Reqd.	Name
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FOLLOWING PARTS ARE SPECIAL FOR KB-121H. P.
RACING ENGINE

Other parts should be ordered from the K Engine Book.

3258	1	Set of Gaskets-Complete
3710	1	Valve Cover & Fume Tube Assembly
3658	1	Cylinder Head-Cast Iron
1826	1	Cyl. Head Water Outlet Fitting
1827	1	Gasket for 1826 Fitting
1823	1	Camshaft
1902	1	Flywheel with Ring Gear
4122	1	Exhaust Manifold
4102	1	Exhaust Manifold Gasket
3580	4	Expansion Plug 1/2"
1829	6	Stud-Exhaust Manifold-Short
1830	2	Stud-Exhaust Manifold-Long
4058	1	Exhaust Manifold End Cover
1741	1	Exhaust Manifold End Cover Gasket
1824	1	Carb. to Manifold Inlet Elbow-Front
3696	1	Carb. to Manifold Inlet Elbow-Rear
3698	1	Carb. to Manifold Inlet Elbow-Inter.
2423	3	Inlet Elbow Gaskets
4112	1	Exhaust Elbow Assembly-Vertical
4114	1	Exhaust Elbow Assembly-Horizontal to Port
4130	1	Exhaust Elbow Assembly-45° down to Port
1741	1	Exhaust Elbow Gasket
1571	3	Carburetor Assembly (Zenith 0-1484)
4814	3	Carburetor Gasket
1572	3	Carburetor Flame Arrestor (Zenith B-175-12A)
1831	3	Throttle Control Bracket
4160	1	Throttle Control Shaft 3/8"x18" Rod
	4	Throttle Control Shaft Lever(D-2880)
	4	Throttle Control Shaft Lever Screw (D-603)
4162	3	Throttle Control Link 1/4"x6-1/2" Rod
13196	6	Throttle Rod Ball Joint

Be Sure To Give Engine Number When Ordering Parts