

INSTRUCTION BOOK AND LIST OF PARTS

Model XK Economy Kerosene-Gasoline Engine

In the 1 $\frac{1}{4}$, 2 $\frac{1}{2}$, 3, 3 $\frac{1}{2}$ and 4 H.-P. Sizes

Help Us—So We Can Serve You Promptly

When ordering repairs always give us the following information so we can be sure of sending you the correct parts:

The Horse-Power.

Engine Number.

**The Model, which is shown after the
horse power.**

You will find all of this information on the top of the water hopper.

Do not send us the parts as sample. Pick out the picture on pages 14 to 24, then refer to the number given in the parts list and order by the name and number of the part.

If you do not give us the information as requested above, we may have to write you for it before we can send the parts you want.

Sears, Roebuck and Co.
The World's Largest Store

Uncrating and Examination

When you receive your Economy Model XK Engine, remove crate and take packages containing small parts from the water hopper. Examine engine closely to see that all bolts and nuts are tight and that engine has not been damaged or tampered with in transit. The hopper should contain the following small parts:

- | | |
|-----------------------|---------------------------------|
| Four grease cups. | One igniter wrench. |
| One sight feed oiler. | One instruction book. |
| One starting crank. | One sample can lubricating oil. |
| One spark plug. | One sample can grease. |

In case any loss or damage is observed, notify your railroad agent within twenty-four hours. Ask him to make a notation of loss or damage on your freight bill. If the agent will not do this, request him to inspect the damage and furnish you with a copy of his loss or damage report; then send this copy of report, together with your paid freight bill, to us and we will take care of it and replace damaged or lost parts free of cost to you.

Location of Engine

If possible, set engine so as to allow ample space on all sides to permit easy access to every part. Engine should be securely fastened to the floor by means of bolts or lag screws to prevent vibration and to obtain the full power on the drive pulley. This can be done by boring holes in the wood skids or by the use of metal stirrups to be hooked over the skids and securely fastened to the floor.

If engine is to be run on the ground, drive stakes of sufficient size and length into the ground and secure engine from movement by bolting or nailing the skids to these stakes.

Exhaust Gas

When engine is installed in a building or enclosed space, the exhaust gas should be piped to the outside, as this gas, if allowed to accumulate, is poisonous. For this purpose, remove the muffler and use an iron pipe as short as possible, avoiding bends and elbows unless absolutely necessary, as these cause back pressure and loss of power.

If exhaust pipe is more than 15 feet long it should be of a larger size than the outlet pipe from the engine. The muffler furnished with the engine can be screwed to the outside end of the pipe. However, unless the noise of the explosions is annoying, it is better to leave the muffler off. As exhaust pipe may become very hot, care must be taken not to bring it into contact with wood or other inflammable material. A vertical exhaust pipe should be provided with a cap to keep the rain out or it should be equipped with a small drain at the lowest part so water will not enter the engine.

Oil Engine Well Before Starting

Your engine is new and all parts are tightly fitted. A liberal oiling of every moving part is necessary before starting. Do not depend upon grease cups and sight feed oiler alone for this first oiling, but take your oil squirt can and oil each moving part. Move the working parts with your hand or by turning flywheel. See that each part moves freely and

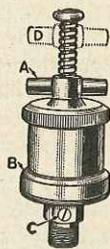
is plentifully supplied with oil. Turn the flywheels until the piston comes out of the cylinder as far as it will and squirt oil on the polished surface of the piston and piston pin inside, spreading it all the way around with the fingers. Plenty of oil and grease in the working parts during the first few weeks that you use your engine may add years to its life. Unscrew the grease cups and fill them with the sample grease we furnish; then screw down until grease is forced out at the end of bearings. Turn the flywheels around two or three times to work the grease over the entire bearing surface. After forcing plenty of grease into the bearings it is a good plan to again remove the grease cups and refill them before starting the engine. Oil the valves and valve stems and make sure that they work freely; also squirt some lubricating oil into the pipe into which the automatic sight feed oiler is screwed. At the same time turn the flywheels around two or three times to lubricate the piston and cylinder.

Regulating Sight Feed Oiler

Screw the automatic sight feed oiler X-13 into top of pipe X-14 [page 16] and fill with a good grade of gas engine or tractor lubricating oil. Adjust oiler to feed ten drops a minute on a full load, or five drops a minute on a light load. Raise the lever on top of oiler straight up and adjust flow as follows: To increase the flow of oil, turn adjusting collar under lever to the right. To decrease the flow turn to the left. To shut off oil, turn lever down. In cold weather oil does not flow freely and a change in adjustment will be necessary, or it may be necessary to warm the oil to make it flow freely.

To Adjust Automatic Connecting Rod Grease Cup No. X-63 Used on the 3½ and 4 H.-P. Engine

To fill and adjust this grease cup, screw lever "A" down as far as it will go. Then unscrew the cup at "B." With a screwdriver turn the screw "C" in the shank to the right until the hole through the bottom of the cup is closed. Fill the cup with grease. Screw the two parts of the cup together securely and turn the lever "A" to the left until it reaches the position "D." Then take screwdriver and turn the screw "C" to the left until grease starts to come out slowly. Then screw cup into position on the connecting rod. In winter, adjusting screw "C" should be wide open, as grease is very stiff and does not feed readily. One filling of grease should be enough for about eight hours' continuous running.



To Connect Ignition

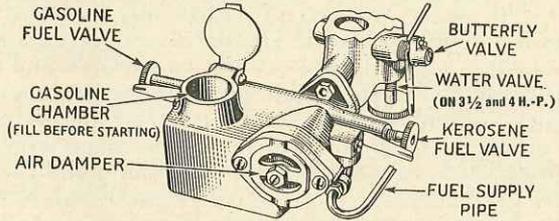
Screw spark plug firmly into position in cylinder head and attach magneto cable to terminal at outer end.

Engine Must Be Started With Gasoline

Economy Model XK Engines operate equally well with gasoline or kerosene as fuel. However, kerosene will not vaporize to form an explosive mixture at ordinary temperatures, and it is necessary to use a small quantity of gasoline to start and warm up the engine before switching over to kerosene. Proceed as explained on next page.

To Start the Engine

First: Fill the engine hopper with just enough clean water to cover the center casting which encloses the piston. The hopper should be completely filled with water after engine is started and warmed up. Use clean, soft or rain water if it can be readily obtained. In cold weather engine will start easier if warm water is put into hopper. The 3½ and 4 H.-P. engine is equipped with a water valve extending down from the damper cage. See that this is tightly closed.

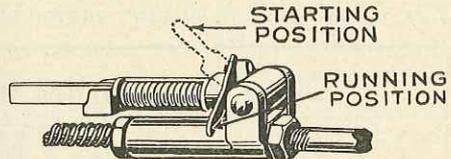


View of Carburetor Showing Operating Parts

Second: Fill the fuel tank with gasoline or kerosene and see that gasoline and kerosene fuel valves are closed.

Third: If gasoline only is used as fuel, turn on the fuel valve No. X-0153 on right side of carburetor one full turn. If kerosene is used in fuel tank, fill the reservoir on left side of carburetor with gasoline. Leave kerosene fuel valve No. X-0153 on right side of carburetor tightly closed and open gasoline fuel valve No. X-0152 on left side one full turn.

Fourth: Turn up top lever on sight feed oiler; lift magneto spark lever No. X-403 (see figure at right) up to the starting position. This retards the spark and prevents the engine from kicking back when you crank it.



Spark Lever in Starting and Running Positions

Fifth: Apply the starting crank to end of crankshaft. Hold intake valve in the cylinder head open with the left hand. Spin the flywheel rapidly five or six times, then release intake valve, but continue to crank engine and, as soon as you release intake valve, place your hand over the air damper inlet on the carburetor so as to partly close the air intake until the engine starts.

Sixth: As soon as the engine starts firing, push the spark lever No. X-403 down as far as it will go, into running position.

Seventh: About the time the gasoline placed in the carburetor is used up or the engine has become hot enough to run on kerosene or distillate, turn on the kerosene by opening kerosene fuel valve No. X-0153 about one full turn; then close the gasoline valve No. X-0152 and adjust the kerosene valve to the point where the engine runs best.

To Stop the Engine

Stop engine by pressing on stop button on magneto, holding it down until the engine comes to a full stop. Other ways of stopping the engine are to close fuel valve No. X-0153 or to pull magneto cable from spark plug. Shut off cylinder oiler by turning down top lever. In freezing weather drain the water from the water jacket by removing drain plug at base of frame. Turn flywheel by hand until exhaust valve is closed to prevent rusting of cylinder walls or valve seats.

Numbers Listed Above Refer to Parts Shown on Pages 14, 15, 16

Regulating Water Valve on 3½ and 4 H.-P. Engine

The water valve is provided only on the 3½ and 4 H.-P. engine, as it is not required on the smaller sizes. It extends below the damper cage, which is located between the carburetor and the engine. It is closed by turning to the right and should never be opened when using gasoline as fuel. When kerosene or other low grade fuel is used, a deposit of red hot carbon is likely to form in the cylinder which causes preignition. This preignition causes the engine to pound and the pounding can be overcome by gradually opening the water valve No. X-0165 a notch at a time until the knocking has ceased. Do not use too much water in trying to entirely stop the pounding as a little knock indicates good power and too much water will result in a loss of power. Be sure to close water valve five minutes before you stop engine to prevent rusting the cylinder and valves.

Fuel Valve Regulation

When starting the engine, particularly in cold weather, it is usually necessary to open the fuel valve more than is required for efficient running after the engine is heated. When engine is thoroughly heated, regulate the valve to supply just enough fuel so that engine fires regularly. Too much fuel is indicated by a smoky exhaust. Too little fuel is shown by popping back through the air intake in the carburetor. Should you flood the engine with fuel, it will lose power and stop. In this case, force the surplus fuel in the cylinder through exhaust valve by grasping rim of flywheel and turning engine backward.

Oiling When Engine Is in Regular Operation

Fill sight feed cylinder oiler daily and add oil as needed. Adjust to feed ten drops a minute on full load, or five drops a minute on light load.

Oil the Following Parts Daily: Wico magneto and tripping mechanism, exhaust and inlet valves and valve lever, governor bearings and moving parts, cam roller and stud, cam rod bearings, butterfly damper bearing.

Oil all gears, pins and fuel valves twice weekly.

Fill grease cups for main bearings and governor bearings daily, and turn down about one turn every two hours.

Fill connecting rod grease cup twice daily on sizes not equipped with automatic grease cup, and turn down one to two turns at two-hour intervals.

Use a good grade medium weight gas engine or tractor lubricating oil. Never use axle grease, kerosene or very light oil for lubrication.

If Water Boils in Engine Hopper

The hotter the water in the hopper gets the better the engine runs because the fuel vaporizes more readily and makes a better explosive mixture, giving you more power for less fuel. The water circulates around the cylinder and cylinder head and carries off the excess heat in the form of steam. Keep the cylinder properly lubricated and the hopper full of water and there will be no danger of the engine overheating.

Care of Water System

If water seems to boil away too fast, or the engine gets very hot, it will be well to check timing of spark (see page 6). Be sure, also, that the spark retard lever No. X-403 is pulled down after starting and that the

Numbers Listed Above Refer to Parts Shown on Pages 14, 15, 16

engine is not being flooded with too much fuel. In freezing weather, drain the hopper when the day's work is done by removing plug located in base for, if the water is allowed to freeze, the cylinder casting or cylinder head will very likely be cracked or broken.

Non-Freezing Solution: A non-freezing mixture can be made by mixing calcium chloride with water in the proportion of about three pounds of calcium chloride to each gallon of water.

Removing Lime Deposit: Should a deposit of lime form in the hopper and water passages it may cause the engine to overheat. To remove this deposit make a solution of seven parts of rain water and one part of muriatic acid. Fill the hopper to the top with this solution and allow it to stand for 24 to 36 hours and then drain off. In mixing this solution pour the acid in the water slowly and stir water constantly while doing so. Never pour water into the acid.

WARNING: Do not pour cold water on a hot cylinder that has run dry as this may cause it to crack. Stop the engine immediately and allow it to cool off before refilling hopper.

Cold Weather Starting

All gasoline and kerosene engines are harder to start when cold as the gasoline does not vaporize readily. You can help to overcome this by filling hopper with warm water. If engine is very cold, pour water in slowly as the sudden change may crack the cylinder. Open the gasoline fuel valve further than you generally do and be sure to close the air damper with the hand when starting or if engine shows signs of stopping, until it starts to fire regularly.

Work the intake valve in and out before starting, as this will remove any frost that may have collected on the valve stem and allow it to work easily. Oil both valves every time you run the engine.

Prime engine with high-test gasoline by pushing open the air intake valve on front of carburetor with the end of oil can spout and squirt in gasoline. After engine starts, regulate gasoline fuel valve, cutting down the fuel supply to the lowest point where it will fire regularly without popping back into the carburetor.

Fuel Trouble

Make certain that there is plenty of fuel in the tank. See that the fuel flows from the tank to the carburetor. If not, the fuel pipe, check valve or fuel valve may be clogged with dirt. If this seems to be the case, remove and clean all connections carefully. If you find fuel valve or connections dirty, remove the drain plug and strain the fuel from tank through a chamois skin which will take out dirt and water.

If your fuel contains water strain it through a chamois skin to remove the water, as it makes the engine hard to start and causes a loss of power. In straining gasoline through chamois skin, ground the chamois skin on a metal object such as the rim of a galvanized iron pail setting on the ground, or otherwise the gasoline may easily be ignited by a spark of static electricity in passing through the chamois.

Speed Regulation

Our engines are set to run at the most efficient speed, calculated to give the greatest power with the lowest fuel consumption. A limited variation

in speed may be made, but it is always best to use a pulley on the driven machine, of the size which will give the correct speed, rather than attempt to change the engine speed.

To reduce speed of engine, loosen the locknut on set screw XY-467 on governor control arm No. X-0154 through opening in flywheel and turn screw to the right. To increase speed of the engine turn the adjusting screw to the left. When the desired speed is obtained tighten locknut.

Position of the Butterfly Valve

The position of the butterfly valve in the damper cage regulates the engine speed. Unless the butterfly valve has been tampered with or is out of position, follow the method of speed regulation explained above.

Across the face of butterfly spindle and damper lever No. X-0167 you will find a line. This line is parallel to the butterfly valve. When butterfly valve is wide open the line should be vertical or straight up and down in the 3½ and 4 H.-P. models. In the 1¾, 2½ and 3 H.-P. models this line is also parallel to the butterfly valve. When butterfly valve is wide open this line should be horizontal or level with the base of engine. When line is in this position the adjusting screw No. XY-467 should just touch the governor spindle rod, so that the action of governor in pushing spindle rod against adjusting screw will close the butterfly valve and thus regulate the speed of the engine.

Testing the Spark

An irregular spark or no spark at all is often caused by a dirty, worn or faulty spark plug. Carbon deposits on the spark points are usually the result of too much fuel or too much lubricating oil. Remove the plug, take it apart and clean all parts thoroughly with gasoline and wipe dry. Scrape firing points with a thin knife blade until they are bright. These points should be about as far apart as the thickness of a well worn dime, or 1/32 of an inch. If engine is in daily use, replace spark plug with a new one about once a year or when points are pitted.

To test spark, first see that the contact surfaces of the armature No. 513 of the magneto are clean and that the magneto end of the lead wire has a good contact. Remove the lead wire from spark plug which should be screwed into position in engine and, holding it about 1/8 of an inch from the terminal on plug, turn engine over once or twice until the magneto trips. If a good bright spark jumps the gap you will know that your trouble is not caused by the magneto.

Now remove the plug, attach the lead wire to the plug terminal and hold the metal side of the plug against the plug opening in cylinder and trip magneto as before. If a good hot spark jumps the gap between the points the trouble is not in the plug. If there is no spark between points the porcelain may be cracked or points badly burned and a new plug will be required. See page 11 for additional instructions.

Spark Regulation

When the spark lever No. X-403 is turned down and in running position, the magneto should trip when the word "Spark," which you will find stamped on the rim of the flywheel, is opposite the top of the cam rod. If magneto does not trip at the right time adjust the trip finger No. X-407 by turning it backward or forward through the adjusting nuts No. X-50 on the cam rod.

Valve Timing

If engine is hard to start or shows a loss of power, the trouble may be

Numbers Listed Above Refer to Parts Shown on Pages 14, 15, 16, 23

due to improper timing of the valves, due to incorrect adjustment of the No. X-06 valve adjusting screw on the valve lever No. X-28.

This being a four-cycle engine, four distinct movements of the piston are necessary to complete the cycle. On the first, or suction stroke, the piston travels from the extreme inner to the extreme outer position.

On the second, or compression stroke, the piston returns to the inner position. During this stroke both valves remain closed.

On the third or power stroke, the force of the explosion in the cylinder again drives the piston to the outer position. Before the piston reaches the extreme outer position the exhaust valve is opened by means of a cam and cam rod which work the valve lever and lift the valve. The proper time for this valve to start to lift is when the crankshaft is half way between the vertical and horizontal position on the downward stroke.

On the fourth, or exhaust stroke, the piston returns to its inner position. The exhaust valve should remain open until the crankshaft has passed the inner center about three to five degrees.

This adjustment is controlled by the No. X-06 adjusting screw on valve lever No. X-28 and is easily made. Notice the setting of the valve from time to time, as it may work out of adjustment as the engine is used. If the exhaust valve spring has weakened so that the suction of piston pulls in the exhaust valve, replace it with a new one.

The correct exhaust valve timing possibly cannot be made with the No. X-06 adjusting screw if the cam gear does not properly mesh with the crankshaft pinion. If this is the case, follow directions given below.

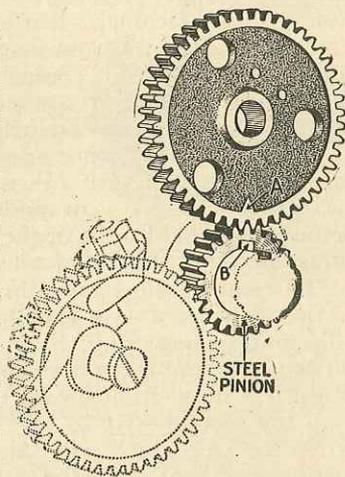
Locating the Cam Gear

If necessary to take off the cam gear or put on a new one, it must be placed in a certain position. The cam on the gear controls the time of the spark, the opening and closing of the valves and, in fact, every operation of the engine depends on the gear being set just right.

To put on cam gear, first remove valve lever No. X-28 and lock cam rod No. X-48 as far back as possible to prevent interference from cam roller when installing new cam gear. Turn flywheel around until key in crankshaft is straight up as shown by "B" in picture at right. Then set the two teeth that are just under the arrow indicator (marked "A" in picture) on the cam gear, over the tooth in the crankshaft pinion just above the key marked "B" in picture. Then roll the cam gear to the left, keeping it in mesh with the crankshaft pinion until it reaches the position shown by dotted gear in illustration. Next set the cam gear stud No. X-52 in place and fasten it with set screw No. XY-167. You can then release the cam rod and replace the valve lever No. X-28.

Be very careful when putting on cam gear, as one tooth out of the way will make a decided difference in the way your engine will run.

Numbers Listed Above Refer to Parts Shown on Pages 14, 15, 16



To Grind Valves

If the flywheels turn too easily against compression it shows a loss of power through leakage. If exhaust valve is timed correctly, see that both inlet and exhaust valves are seating properly. If either leaks, it can often be corrected by pulling out on end of valve stem with a pair of pliers and at the same time turning valve so valve head rubs on seat. If this does not increase compression, remove the cylinder head, take off valve spring and remove one or both valves to be ground. Wash valve and valve seat in gasoline; make a paste of fine emery dust and oil, or use powdered pumice stone (which can be obtained at almost any drug store) and oil. Smear this mixture on valve and valve seat. Put valve in place and slip a nail through hole in top of valve stem. Draw valve towards seat and turn from left to right for a minute or two and then lift valve and turn it about half way around and repeat until valve and seat show a smooth, even surface all the way around.

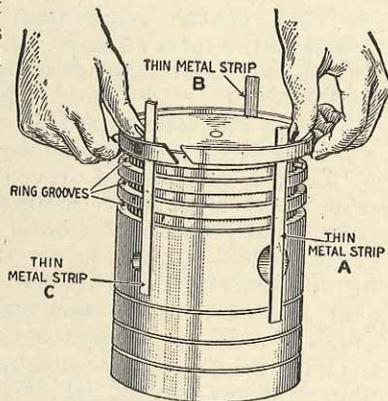
Wash both valve and seat clean with gasoline. In replacing, put heavy spring on exhaust valve and light spring on intake valve; also remove carbon from end of piston and cylinder head. In replacing cylinder head tighten the head stud nuts alternately, being careful not to tighten one more than the other. After engine is warmed up retighten these nuts.

Piston and Rings

Each piston is fitted with three rings that spring out and press against the walls of the cylinder to prevent the compressed gas from escaping. The piston rings must fit free in the grooves in piston. Too much or a low grade of lubricating oil or fuel will, in time, cause a carbon deposit to form around the rings binding them in the grooves so that they cannot act freely. To prevent this loss of power, piston must be removed and rings and grooves cleaned. Proceed as follows:

Disconnect wire from magneto to spark plug. Now take out connecting rod bolts at crankshaft end of connecting rod and separate connecting rod from crankshaft. Next, remove governor spindle and balls as directed on page 10. Piston can now be withdrawn. If you find piston rings gummed or held tight in the grooves they must be removed and cleaned.

To remove rings take three thin metal strips (old hack saw blades will do) and slip under center ring. Start the first strip at the joint and force it all the way around until it is in position shown by "A." Then slip the second strip to "B" and the third strip to "C," which will raise ring out of grooves so that it can be slipped off. Repeat the operation with the top ring next and then the bottom ring. Wash rings and grooves with kerosene or gasoline, or you may have to scrape them clean with a knife. To replace rings, put the center ring on first, using the three metal strips as before and then, without using the metal strips, you can slip the top ring on and then the bottom ring bringing it up from the bottom of piston. Before replacing piston in cylinder, oil the rings and surface of the piston thoroughly.



Method of Removing and Replacing Piston Rings

Packing Cylinder Head

If packing for cylinder head should blow out or become broken when removing cylinder head, before replacing with a new packing scrape the cylinder and head to a smooth, clean surface, removing all particles of old packing. After putting on new packing, push cylinder head in close to cylinder and screw nuts on by hand as far as they will go. Then, with a wrench, turn each nut one after another about one-half turn at a time until all are tight. Do not screw one nut down tight and then go to the next as this will make an uneven joint and the packing will not hold. After engine has run ten minutes and heated up, go over all nuts and tighten them again. If you buy ordinary asbestos packing at your hardware store, soak it in linseed oil before using. This is not necessary with the graphite asbestos packing we sell (see No. 23X17, page 17).

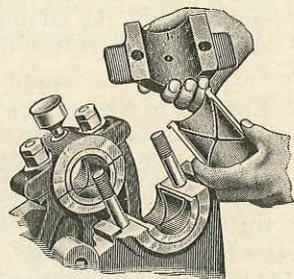
IMPORTANT: If you use sheet asbestos packing, be sure to cut out packing for all openings so water can circulate through cylinder head and around valves or they will overheat and be ruined.

Bearings

Watch all engine bearings closely. They should run freely but without excess play or looseness. Loose bearings rack the engine and will soon break something. A tight bearing will heat up and bind or melt.

The main bearings and crankshaft end of connecting rod are equipped with special anti-friction, die cast bearings which fit perfectly in machined seats. Piston end of connecting rod has a bronze bushing. When worn, it can be driven out and a new one driven in.

Main bearings and bearing between crankshaft and connecting rod are provided with thin metal shims or liners to take up wear. When necessary, remove bearing cap and take out enough shims on each side so bearing fits snugly. Screw down bolts and open intake valve by pushing it in and then turn flywheels around by hand to see if they turn freely. If they bind you have taken out too many liners and should put back enough so engine will turn over freely. Keep bearing cap bolts tight; also keep grease cups filled and give them a turn each time you start engine.



The Main Bearings Are Removable and Provided with Shims to Take up Wear

To Put on Cam Rod Spring

The cam rod spring holds the cam rod and roller against the cam on the cam gear. This spring does a lot of work and, if it weakens, should be replaced with a new one (see No. X-059 in repair list). To replace, remove the cylinder head, slip the new spring over end of cam rod and replace cylinder head. If necessary to repack cylinder head see above.

Removing and Replacing Flywheels

Loosen bolt on hub of flywheel and this should permit flywheel to be removed. If wheel is tight on shaft, place end of a piece of hardwood against the hub of wheel and tap it firmly with a hammer. A little kerosene poured into flywheel slot will help to loosen wheel. If shaft is rusty, remove rust with kerosene and sandpaper.

To take off pulley on $1\frac{3}{4}$, $2\frac{1}{2}$ and 3 H.-P. engines, loosen set screw with a screwdriver and drive pulley off.

When replacing flywheel, place it in proper position on shaft, tighten the bolt down securely and drive in key.

To Take Off Governor Balls, Spindle or Pinion

Loosen the small set screw that locks the governor pinion on the governor spindle. Now hold the flywheel stationary, thus locking the gears and turn governor balls to the right.

To Figure Pulley Sizes

Our Economy Model XK engines in all sizes develop an excess over their rated horse-power at their normal speed, as marked on the brass nameplate on top of the water hopper. Obtain the proper speed in the driven machinery by use of pulleys of the proper size, rather than attempt to make any considerable change from the normal engine speed.

The speed of the engine and the diameter of the pulley furnished with it being known, obtain the size of pulley to be used on driven machine as follows: Multiply the rated speed of engine by the diameter of engine pulley and then divide the result by the rated speed of the machine to be driven.

To figure the correct size pulley for your engine, when size of pulley and speed of machine to be driven are known, multiply the speed of driven machine by the diameter of its pulley and divide by the rated engine speed. The result will be the diameter of the engine pulley.

We can also supply standard iron pulleys for Economy Model XK Engines in sizes other than those regularly furnished. If interested, write for price on the size required, stating horse-power and number of your engine as given on nameplate.

We sell clutch pulleys for use on engine shaft, which enable you to stop the driven machine without stopping engine and to crank engine more easily when starting. They also do away with the need of tight and loose pulleys on lineshaft and shifting of belt. See our large General Catalog for prices.

Damage Through Freezing

In freezing weather, take no chance. Remove drain plug in base and drain water jacket and hopper when the day's work is finished. If you fail to do this and the water cooling system freezes, a cracked or broken cylinder, cylinder head or water jacket is almost certain to be the result, necessitating costly repairs and loss of the use of engine until repairs are made.

You can, in some cases, have the water jacket or cylinder head welded at your local garage, but a cracked cylinder is usually a total loss.

If crack is in water jacket and is a small one, it can often be repaired by either of the following methods:

Close crack on the outside with putty or tallow, being careful not to force the material into the crack. Make a solution of one pound sal ammoniac to a gallon of water. Fill the hopper high enough to cover the

crack with this solution. Let it stand for half an hour; then drain out, saving the solution. Now run engine for five minutes to heat jacket. Stop the engine and refill with the solution and repeat. Do this three or four times and, if crack is not too wide, it will be permanently closed up.

The other method for wider cracks is by the use of iron cement or Smooth-on No. 1 which can be purchased in most hardware stores. Scrape each side of the crack down with the broken end of an old flat file to form a sort of gutter or funnel and scrape off the paint for about $\frac{1}{4}$ of an inch each side of the crack. Mix the cement according to directions and, with a putty knife or common steel case knife, force the cement into the crack until it is filled. Smooth off surface and let set for about a day before using the engine.

Care of Wico Magneto Ignition System

Oil the Wico Magneto every day you use the engine by squirting a few drops of oil in the oil cup marked "Oil Daily." The armature, No. 513, must make a perfect contact with cores projecting from bottom of magneto. Keep these surfaces perfectly clean and free from straw, sand, ice, leaves or anything which will prevent a perfect contact.

After considerable use an oily deposit may gather inside the breaker point tube, around the upper contact. To clean this off, remove the two screws holding magneto to engine frame. Lift it off and separate armature. Next remove the two screws No. 199 at each end of magneto at bottom, and take off cover band and front cover. Clean away oily deposit around upper contact with a clean rag and slim hardwood stick. When replacing armature, be sure that the oil pad No. 505 slips over the guide rod. Do not remove magnets, as this is never necessary and instantly destroys their magnetism.

Ignition Trouble

If you do not get a spark or the spark is weak, start to look for the cause at the spark plug. If firing points are carbonized, take plug apart and clean with kerosene or gasoline. Examine porcelain and, if cracked, replace it or buy a new plug. See that the points are clean and adjust them so that a well worn dime will just slip between them. Examine the lead wire and look for breaks or loose connections. Test spark from magneto by holding lead wire terminal about $\frac{1}{8}$ of an inch from metal engine frame when cranking engine. If a spark is produced, the trouble is in the spark plug. If there is no spark, proceed as follows:

See that armature No. 513 returns and makes a firm contact with cores after being tripped off. Failure to do this indicates a weakened or broken return spring No. 97, or friction of moving parts caused by lack of oil. Remove any dirt from armature or face of cores. Turn the flywheel over slowly and see that when armature No. 513 is tripped it snaps quickly away from the cores. Failure to do this indicates binding or friction, or a broken latch spring No. 186.

See that all electrical connections are tight and also remove front cover from magneto and, with a small piece of hardwood or wire, remove any dirt from contact surfaces Nos. 301 and 223 and insulating washer No. 168.

Numbers Listed Above Refer to Parts Shown on Pages 15—23

Adjusting Latch-Off of Trip Finger

The rocker arm No. 412 is provided with a screw No. 419 and locknut for adjusting the "latch-off" of the trip finger. This screw must be set so that the latch No. 407 will slip off the lip of the rocker arm just after the breaker points have been opened by the downward movement of the armature.

If the screw is screwed OUT too far the breaker points will not open and the magneto will not spark.

If the screw is screwed IN too far the latch will drive the armature down too far and possibly break the return spring or the parts that hold it.

This adjustment was properly made by the engine builder and should not require attention thereafter. It has nothing whatever to do with the time of the spark.

If necessary, the adjustment can be made as follows:

Trip the armature No. 513 from its contact with the cores and insert a strip of metal $\frac{7}{64}$ -inch thick between the armature and the face of the cores. Move the push rod slowly until the latch No. 407 reaches the rocker arm. The edge of the latch should then just engage the edge of the lip of the rocker arm, and the adjusting screw No. 419 should be bearing on the top side of the latch so that the least further movement of the push rod will cause the latch to slip off the edge of the rocker arm.

If the latch does not engage the lip of the rocker arm when armature is set as above, the adjusting screw should be screwed in until the latch just engages. If the latch engages the lip of the rocker arm too much (more than $\frac{1}{32}$ -inch) unscrew the adjusting screw to give the proper engagement.

Loosen the locknut on the adjusting screw No. 419 before attempting to change adjustment and be sure to set it up tight after the adjustment has been made. Remove the metal strip before attempting to start the engine.

Adjustment of Breaker Points

The breaker point contacts are perfectly adjusted at the factory and no readjustment will be required except when installing new contacts, at which time proceed as follows:

The breaker point contacts Nos. 301 and 223 should just touch when the armature No. 513 is $\frac{7}{64}$ -inch from the cores. To adjust, trip the armature from its contact with the cores, and insert a strip of metal $\frac{7}{64}$ -inch thick between the armature No. 513 and the face of the cores. Loosen the nuts No. 302 on the breaker point stem, and turn the upper nut until the contact No. 223 just touches the contact No. 301. Then set up the lower nut tight against the upper nut. As soon as adjustment has been made, be sure to remove the strip that you placed between the armature and cores.

Replacing Breaker Points

The best results will be obtained if both contacts are renewed whenever one of them fails. If either contact fails it may leave the other in such uneven shape as to spoil a new contact.

To replace the moving contact No. 223: Withdraw the moving parts and remove the old contact and its spring No. 38 from the breaker point

Numbers Listed Above Refer to Parts Shown on Pages 15—23

plate by unscrewing the two nuts No. 302. Substitute the new moving contact, being careful to replace the felt washers No. 505.

Replace the nuts and the lock washers between them. After replacing the moving parts, adjust the breaker point contacts as explained under "Adjustment of Breaker Points" on previous page.

To replace fixed contact No. 301: Remove the front cover and the spring support No. 253 and withdraw the moving parts. Disconnect condenser lead (S) and primary lead No. 217 from breaker point tube No. 158. Remove all nuts and washers from shank of the contact No. 301 and push contact down and out of tube. There are two insulating washers Nos. 168 and 184 inside of tube and these should be removed also.

New insulating washers Nos. 168 and 184 and new nuts will be supplied with each new fixed contact, and these should always be used in replacements.

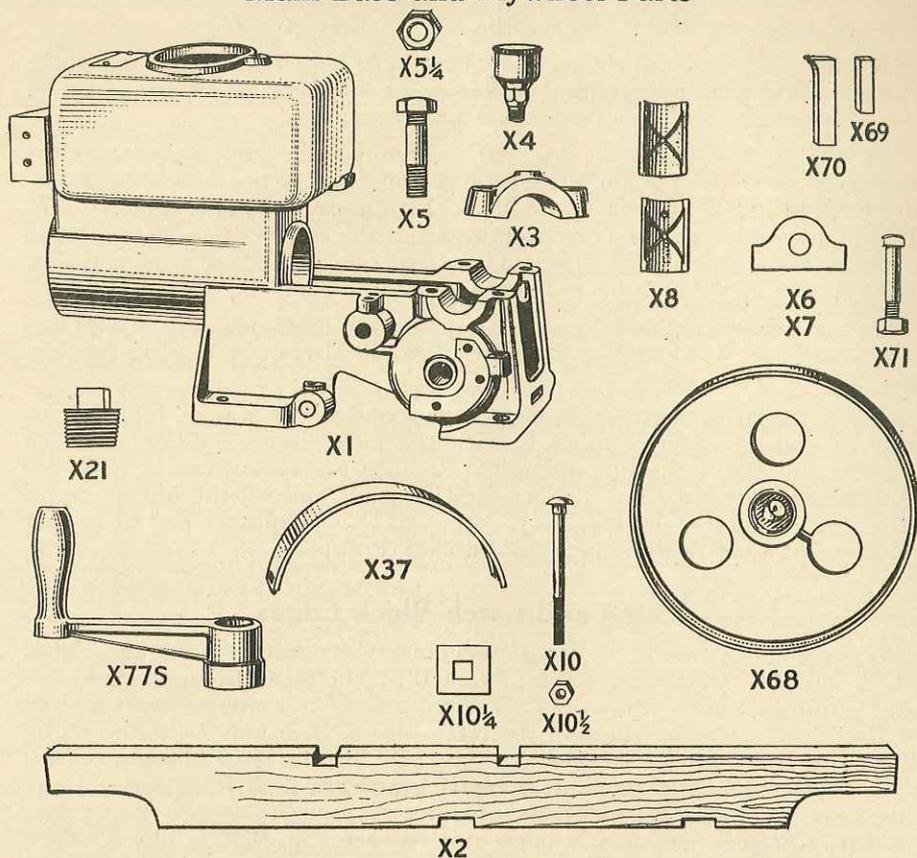
Place insulating washers on new contact and insert in tube, replace outside insulating washer, cover it with the large brass washer and lock washer and screw the nut up tight. Replace the two washers Nos. 240 and 238 and the nut (N). Insert the two leads and set the nut up tight. After replacing the moving parts, see that the contacts are in proper adjustment (see "Adjustment of Breaker Points").

Latch and Latch Block Edges

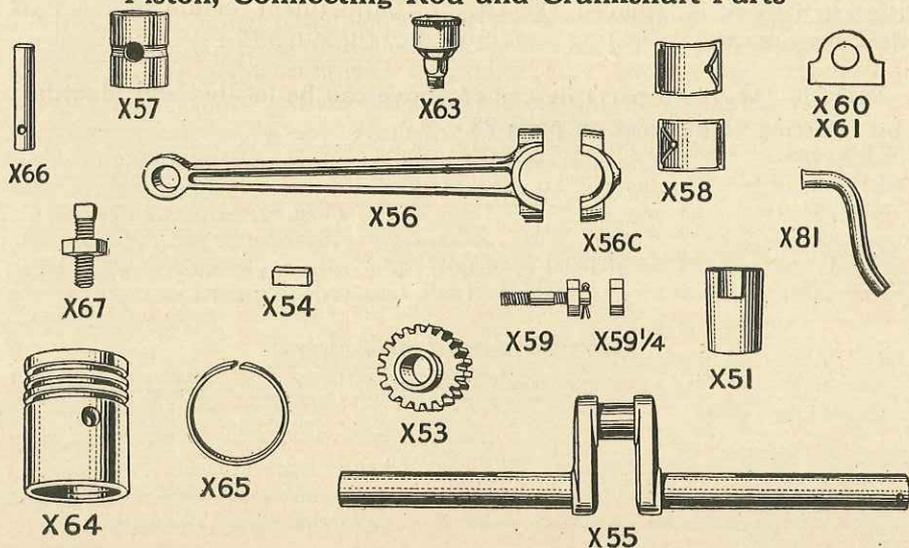
If the edge of the latch No. 407 becomes worn where it engages latch block No. 5, a fresh edge can be obtained by clamping the latch in a vise and pulling it out of the trip finger and giving it a quarter turn before replacing it. A fresh edge on the latch block No. 5 may be obtained by loosening the latch block screw No. 6 and giving the latch block a quarter turn before replacing it. The screw is headed over at its outer end and the heading should be filed off before attempting to loosen the screw. Be sure to replace the lock washer and set screw up tight. The latch-off screw No. 419 should be removed to get at the latch block screw. After the latch block is replaced, the latch-off adjustment should be made as described under "Adjusting Latch-off of Trip Finger."

NOTE—Magneto parts described above can be located and identified by referring to pictures on page 23.

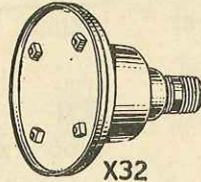
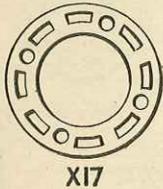
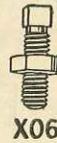
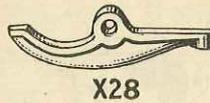
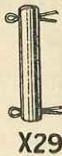
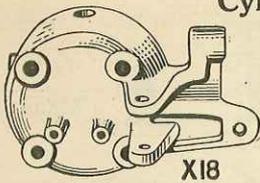
Main Base and Flywheel Parts



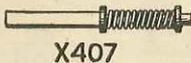
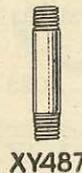
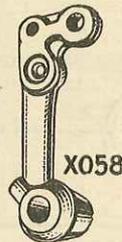
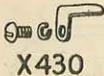
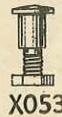
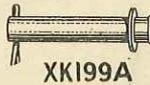
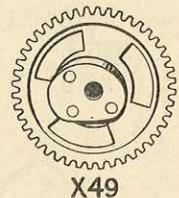
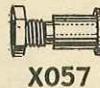
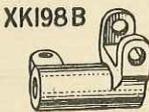
Piston, Connecting Rod and Crankshaft Parts



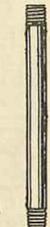
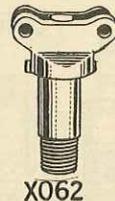
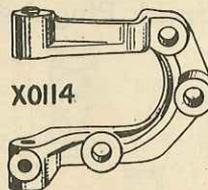
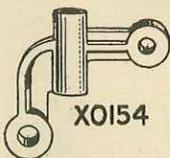
Cylinder Head and Muffler Parts



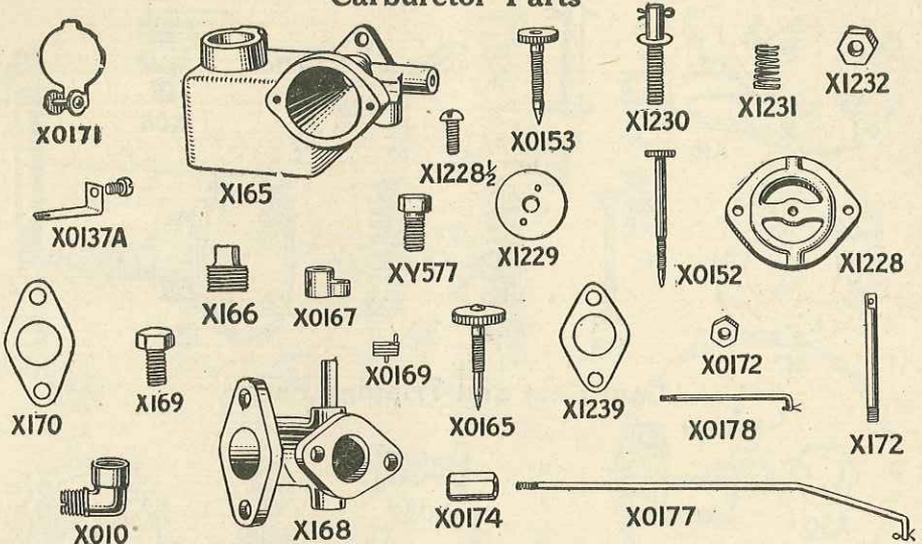
Cam Gear and Tripping Parts



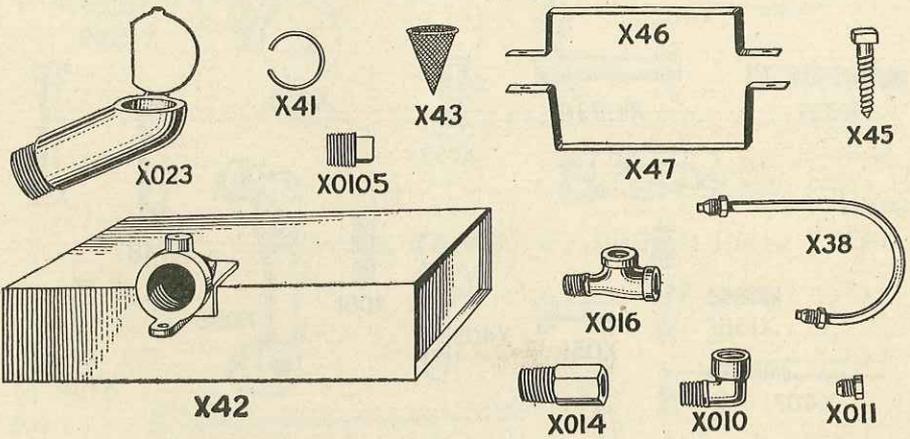
Governor Parts



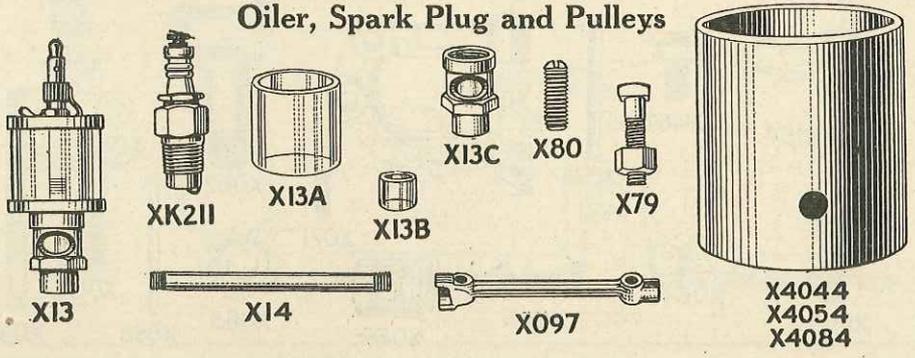
Carburetor Parts



Fuel Tank and Supply Line Parts



Oiler, Spark Plug and Pulleys



Price List of Parts for Economy Model XK Throttling Governor Engine in the 1¾, 2½, 3, 3½, and 4 Horse-Power Sizes

In ordering be sure to give the following information:

Horse-Power.

Engine Number.

The Model, which is the letter shown after the horse-power on the name plate.

For illustrations of parts see pages 14 to 16. Part number in the left hand column indicates the number of the illustrations.

Parts marked (*) will be shipped by freight, prepaid. All other parts are shipped by PREPAID parcel post.

Part No.	Name of Part	HORSE-POWER		
		1¾	2½ and 3	3½ and 4
23X1	*Base, for Engines with No. X21 Drain Plug on Pulley side.....	\$18.10	\$21.85	\$26.90
23X1B	*Base, for Engines with No. X21 Drain Plug on Magneto side.....	18.10	21.85	26.90
23X2	Wooden Skids. Each.....	.75	.75	1.40
23X3	Base Cap.....	.70	.85	1.25
23X4	Main Bearing Grease Cup.....	.12	.12	.15
23X5	Base Cap Stud and Nut.....	.30	.35	.35
23X5¼	Base Cap Stud Nut.....	.05	.05	.05
23X6	Bearing Liners, thick. Per set.....	.15	.20	.20
23X7	Bearing Liners, thin. Per set.....	.....	.....	.23
23X8	Main Bearings (2 halves).....	1.20	1.30	1.55
23X10	Skid Bolt.....	.10	.10	.10
23X10½	Nut for Skid Bolt.....	.03	.03	.03
23X10¾	Square Washer for Skid Bolt.....	.08	.08	.08
23X12	Cylinder Head Stud and Nut.....	.35	.35	.45
23X12½	Cylinder Head Stud Nut.....	.05	.05	.10
23X13	Sight Feed Oiler Complete.....	1.95	1.95	2.10
23X13A	Large Glass for Oiler	.45	.45	.53
23X13B	Small Glass for Oiler	.30	.30	.30
23X13C	Small Glass Cage....	.30	.30	.30
23X14	Oiler Pipe.....	.25	.30	.30
23X17	Cylinder Head Gasket.....	.50	.55	.60
23X18	Cylinder Head Complete With Valves and Springs, for Engines with No. X21 Drain Plug on Pulley side.....	5.20	7.35	10.80
23X18B	Cylinder Head Complete with Valves and Springs, for Engines with No. X21 Drain Plug on Magneto side.....	5.20	7.35	10.80
23X19	Exhaust or Inlet Valve With Washer and Pin .....	.40	.40	.65
23X21	Cylinder Drain Plug.....	.05	.05	.05
23X22	Exhaust Valve Spring, for Engines with No. X21 Drain Plug on Pulley side.....	.15	.15	.15
23X22B	Exhaust Valve Spring, for Engines with No. X21 Drain Plug on Magneto side	.15	.15	.15
23X23	Inlet Valve Spring.....	.15	.15	.15

Give name of
manufacturer of oiler

Price List of Parts for Economy Model XK Throttling Governor Engine in the 1³/₄, 2¹/₂, 3, 3¹/₂ and 4 Horse-Power Sizes—Continued

In ordering be sure to give the following information:

Horse-Power.

Engine Number.

The Model, which is the letter shown after the horse-power on the name plate.

For illustrations of parts see pages 14 to 16. Part number in the left hand column indicates the number of the illustrations.

WE PAY THE POSTAGE ON ALL ITEMS ON THIS PAGE.

Part No.	Name of Part	HORSE-POWER		
		1 ³ / ₄	2 ¹ / ₂ and 3	3 ¹ / ₂ and 4
23X28	Valve Lever.....	\$0.45	\$0.45	\$0.50
23X29	Valve Lever Pin.....	.12	.12	.15
23X31	Muffler Plate, not illustrated.....	1.00	1.00	1.65
23X32	Muffler, complete.....	1.88	1.88	2.78
23X37	Oil Guard.....	.55	.75	.90
23X38	Supply Pipe With Connectors.....	.52	.52	.60
23X41	Strainer Ring.....	.05	.05	.05
23X42	Fuel Tank.....	2.25	2.55	2.90
23X43	Filler Pipe Strainer.....	.20	.20	.20
23X45	Lag Screw, for Fuel Tank Support Straps.	.05	.05	.05
23X46	Upper Fuel Tank Support Strap.....	.20	.20	.20
23X47	Lower Fuel Tank Support Strap.....	.20	.20	.20
23X48	Cam Rod.....	.55	.55	.90
23X49	Cam Gear.....	2.20	2.20	3.40
23X50	Adjusting Nut for Trip Rod.....	.05	.05	.05
23X51	Crankshaft Sleeve Cover for Keyway....	.15	.15	.15
23X52	Cam Gear Stud, complete.....	.25	.25	.35
23X53	Crankshaft Pinion.....	1.00	1.05	1.85
23X54	Crankshaft Pinion Key.....	.09	.09	.09
23X55	Crankshaft	7.05	8.30	11.05
23X56	Connecting Rod and Cap (includes 57, 59, 59 ¹ / ₄)	4.50	5.60	7.70
23X56A	Connecting Rod, complete with bearings (not illustrated).....	5.40	6.60	8.75
23X56C	Connecting Rod Cap only.....	.70	.....	.....
23X57	Connecting Rod Bushing.....	.45	.60	.80
23X58	Connecting Rod Bearing (2 halves).....	.98	1.10	1.15
23X59	Connecting Rod Bolt With Cotter Pin and Nut .....	.30	.35	.55
23X59 ¹ / ₄	Connecting Rod Nut.....	.06	.06	.06
23X60	Connecting Rod Liners, thick. Per set....	.15	.15	.23
23X61	Connecting Rod Liners, thin. Per set....	.15	.15	.23
23X63	Connecting Rod Grease Cup.....	.38	.38	.75
23X64	Piston	2.90	3.60	4.50
23X65	Piston Rings. Each.....	.38	.38	.45
23X66	Piston Pin.....	.53	.60	.75
23X67	Piston Pin Set Screw With Locknut....	.09	.09	.09

Price List of Parts for Economy Model XK Throttling Governor Engine in the 1³/₄, 2¹/₂, 3, 3¹/₂ and 4 Horse-Power Sizes—Continued

In ordering be sure to give the following information:

Horse-Power.

Engine Number.

The Model, which is the letter shown after the horse-power on the name plate.

For illustrations of parts see pages 14 to 16. Part number in the left hand column indicates the number of the illustrations.

Parts marked (*) will be shipped by freight prepaid. All other parts are shipped by PREPAID parcel post.

Part No.	Name of Part	HORSE-POWER		
		1 ³ / ₄	2 ¹ / ₂ and 3	3 ¹ / ₂ and 4
23X68	*Flywheel, each, with key.....	\$9.10	See Prices Below	See Prices Below
23X69	Flywheel Key, pulley side.....	.12	.12	.12
23X70	Flywheel Key, cranking side.....	.12	.12	.12
23X71	Flywheel Bolt and Nut.....	.15	.20	.25
23X77S	Starting Crank (socket type).....	1.00	1.00	1.50
23X79	Machine Bolt for Pulley.....	.....	.....	.15
23X80	Pulley Set Screw.....	.10	.10	.....
23X81	Piston Oil Tube (furnished on 3 ¹ / ₂ and 4 horse-power only).....	.....	.....	.30
23X165	Carburetor Body only.....	3.00	3.00	3.00
23X165A	Carburetor, complete (not illustrated) ..	5.00	5.00	5.00
23X166	Carburetor Drain Plug.....	.05	.05	.05
23XY167	Cam Gear Pin Set Screw.....	.05	.05	.05
23X168	Air Damper Cage With Damper and Stem	3.00	3.00	3.40
23X169	Air Damper Cage to Cylinder Head Cap Screw (thin head).....	.08	.08	.08
23X170	Air Damper Cage to Cylinder Head Gasket	.15	.15	.25
23X172	Push Rod From Governor.....	.20	.20	.20
23X186	Latch Spring.....	.25	.25	.25
23XK198A	Trip Bracket Assembly (not illustrated) ..	1.75	1.75	1.75
23XK198B	Trip Bracket Casting.....	.35	.35	.35
23XK198C	Trip Bracket Assembly Complete (not illustrated) ..	3.00	3.00	3.00
23XK199A	Trip Finger Pin.....	.15	.15	.15
23XK211	Spark Plug.....	.75	.75	.75
23X403	Spark Lever With Screw and Washer...	.25	.25	.25
23X407	Latch Group.....	1.00	1.00	1.00
23X422	Trip Finger Support Spring.....	.15	.15	.15
23X429	Trip Finger Frame.....	.75	.75	.75
23X430	Latch Group Clip.....	.07	.07	.07
23XY467	Governor Control Arm Adjusting Screw With Nut.....	.05	.05	.05
23XY487	Cam Gear Oiler Pipe.....	.15	.15	.15
23XY577	Damper Cage to Carburetor Cap Screw...	.05	.05	.05
23X1228	Air Damper Plate.....	.45	.45	.45
23X1228 ¹ / ₂	Air Damper Plate Attaching Screw.....	.04	.04	.04
23X1229	Air Damper Disc.....	.05	.05	.05

2¹/₂ H.-P., \$10.35; 3 H.-P., \$13.30; 3¹/₂ H.-P., \$13.85; 4 H.-P., \$20.70.

Price List of Parts for Economy Model XK Throttling Governor Engine in the 1 $\frac{3}{4}$, 2 $\frac{1}{2}$, 3, 3 $\frac{1}{2}$ and 4 Horse-Power Sizes—Continued

In ordering be sure to give the following information:

Horse-Power.

Engine Number.

The Model, which is the letter shown after the horse-power on the name plate.

For illustrations of parts see pages 14 to 16. Part number in the left hand column indicates the number of the illustrations.

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Part No.	Name of Part	HORSE-POWER		
		1 $\frac{3}{4}$	2 $\frac{1}{2}$ and 3	3 $\frac{1}{2}$ and 4
23X1230	Air Damper Stem With Washer.....	\$0.15	\$0.15	\$0.15
23X1231	Air Damper Spring.....	.15	.15	.15
23X1232	Air Damper Stem Locknut.....	.05	.05	.05
23X1239	Carburetor Gasket.....	.15	.15	.15
23X4044	4x4-Inch Cast Iron Pulley.....	1.40	.....	.....
23X4054	5x4-Inch Cast Iron Pulley.....	.....	1.55	.....
23X4084	8x4-Inch Cast Iron Pulley.....	.....	.....	2.55
23X06	Valve Lever Adjusting Screw With Nut..	.12	.12	.12
23X010	Angle Connection, for Fuel Supply Pipe..	.30	.30	.....
23X011	Straight Connection, for Fuel Supply Pipe.	.....	.....	.30
23X014	Straight Valve Cage and Check Valve....	.60	.60	.60
23X016	Pipe Tee, for Fuel Supply Pipe.....	.20	.20	.20
23X023	Filler Pipe, for Fuel Tank.....	.65	.65	.65
23X051	Rocker Arm Stud Pin With Washer, for Engines with No. X21 Drain Plug on Pulley side .....	.10	.10	.15
23X051B	Rocker Arm Stud Pin with Washer, for Engines with No. X21 Drain Plug on Magneto side .....	.10	.10	.15
23X053	Cam Rod Pin With Nut.....	.25	.25	.25
23X056	Cam Roller.....	.32	.32	.32
23X057	Cam Roller Pin With Nut.....	.25	.25	.25
23X058	Rocker Arm, for Engines with No. X21 Drain Plug on Pulley side.....	1.05	1.05	1.05
23X058B	Rocker Arm, for Engines with No. X21 Drain Plug on Magneto side.....	1.05	1.05	1.05
23X059	Cam Rod Spring.....	.12	.12	.12
23X060	Governor Complete (not illustrated).....	4.50	4.50	4.75
23X061	Rocker Arm Pin Set Screw.....	.05	.05	.05
23X062	Governor Spindle, for Engines with No. X21 Drain Plug on Pulley side.....	1.25	1.25	1.25
23X062B	Governor Spindle, for Engines with No. X21 Drain Plug on Magneto side....	1.25	1.25	1.25
23X063	Governor Pinion With Set Screw, for Engines with No. X21 Drain Plug on Pulley side .....	.55	.55	.55

Price List of Parts for Economy Model XK Throttling Governor Engine in the 1¾, 2½, 3, 3½ and 4 Horse-Power Sizes—Continued

In ordering be sure to give the following information:

Horse-Power.

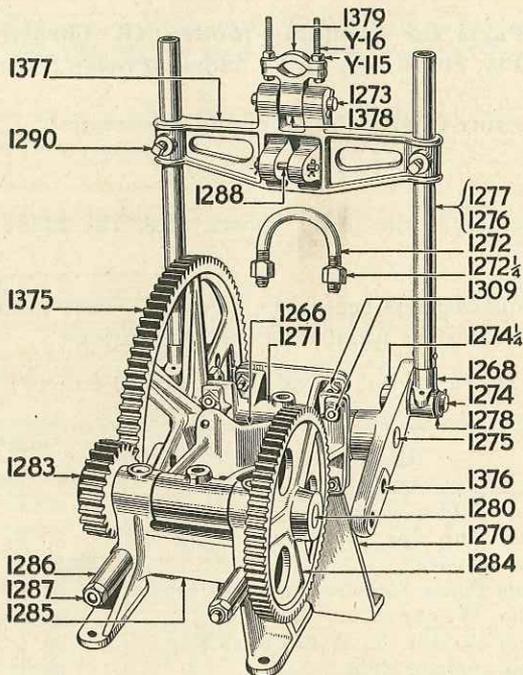
Engine Number.

The Model, which is the letter shown after the horse-power on the name plate.

For illustrations of parts see pages 14 to 16. Part number in the left hand column indicates the number of the illustrations.

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Part No.	Name of Part	HORSE-POWER		
		1¾	2½ and 3	3½ and 4
23X063B	Governor Pinion With Set Screw, for Engines with No. X21 Drain Plug on Magneto side	\$0.55	\$0.55	\$0.55
23X063½	Governor Pinion Set Screw (not illustrated)	.05	.05	.05
23X064	Governor Weight.....	.25	.25	.25
23X065	Governor Weight Pin With Cotter Key...	.09	.09	.09
23X068	Governor Spindle Rod.....	.20	.20	.20
23X069	Governor Spindle Bushing, for Engines with No. X21 Drain Plug on Pulley side .....	.40	.40	.40
23X069B	Governor Spindle Bushing, for Engines with X21 Drain Plug on Magneto side	.40	.40	.40
23X070	Speed Changing Washer.....	.08	.08	.08
23X071	Governor Bracket Lever Pin Set Screw..	.05	.05	.05
23X075	Governor Bracket Lever Pin.....	.10	.10	.10
23X097	Wrench Combination .....	.30	.30	.30
23X0101	Grease Cup, for Cam Gear or Governor...	.15	.15	.15
23X0102	Governor Spindle Oiler Pipe.....	.15	.15	.15
23X0105	¼-Inch Fuel Tank Drain Plug.....	.05	.05	.05
23X0114	Governor Bracket.....	1.25	1.25	1.50
23X0115	Governor Bracket Cap Screw With Lock Washer .....	.10	.10	.10
23X0137A	Fuel Valve Spring (flat, with screw).....	.08	.08	.08
23X0138	Governor Spindle Rod Spring.....	.12	.12	.12
23X0152	Fuel Valve (gasoline side).....	.30	.30	.30
23X0153	Fuel Valve (kerosene side).....	.30	.30	.30
23X0154	Governor Control Arm.....	.30	.30	.40
23X0165	Water Valve (used on 3½ and 4 H.-P. only	.....	.....	.30
23X0167	Butterfly Damper Lever .....	.12	.12	.12
23X0169	Butterfly Damper Spring.....	.10	.10	.10
23X0171	Carburetor Lid and Pin.....	.10	.10	.10
23X0172	Air Damper Rod Adjusting Nut.....	.05	.05	.05
23X0174	Air Damper Rod Turn Buckle.....	.15	.15	.15
23X0177	Air Damper Rod (long section).....	.25	.25	.25
23X0178	Air Damper Rod (short section).....	.20	.20	.20



Price List of Parts for Direct Connected Horizontal and Vertical Pump Jacks for the 1 3/4 Horse-Power Size

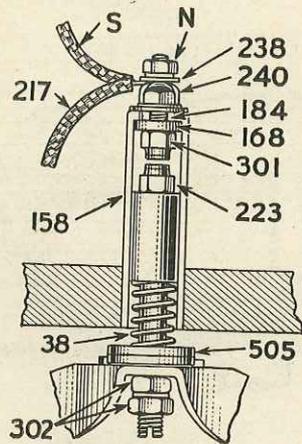
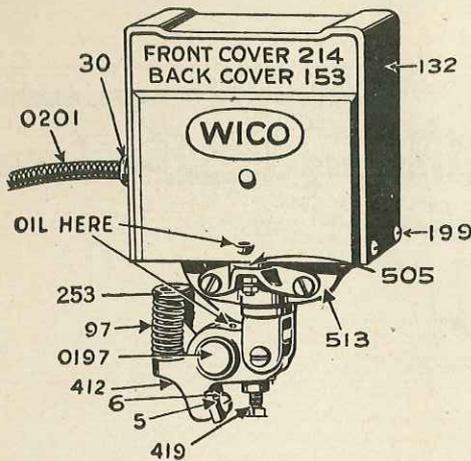
In ordering be sure to give the following information:
Engine Number.

The Model, which is the letter shown after the horse-power on the name plate.

For illustrations of parts see above. Part number in the left hand column indicates the number on the illustration.

All parts are shipped by parcel post, postage paid by us.

Part No.	Name of Part	Price	Part No.	Name of Part	Price
23J1266	Pump Gear Bearing and Bracket	\$5.20	23J1280	Small Gear Shaft.....	\$0.75
23J1268	Pump Rod Head With Pin (state diameter of pump rod) .....	.90	23J1283	Pinion With Pin.....	2.35
23J1270	Stand for Horizontal Jack	1.40	23J1284	Gear With Pin.....	3.50
23J1271	Pump Gear Bearing....	1.75	23J1285	Jack Support to Engine Bracket	2.85
23J1272	Vertical Pump Clamp..	.20	23J1286	Pipe Spacer to Engine..	.10
23J1272 1/4	Nut for Clamp.....	.05	23J1287	Stud With Nut for Engine Bracket.....	.10
23J1273	Pump Lever Pin and Cotter Pin.....	.10	23J1288	Vertical Pump Rod Pin and Cotter Pin.....	.15
23J1274	Pump Rod Stud and Cotter Pin .....	.25	23J1290	Set Screws.....	.05
23J1274 1/4	Nut for No. 1274.....	.10	23J1309	Bolt for Stand.....	.05
23J1275	Large Pump Gear Shaft	.75	23J1375	Crank Gear With Pin..	6.60
23J1276	Horizontal Short Pump Rod	1.10	23J1376	Bell Crank With Pin...	1.65
23J1277	Vertical Long Pump Rod	1.80	23J1377	Crosshead	2.45
23J1278	Washer for Pump Rod Stud .....	.05	23J1378	Pump Handle Clamp...	.40
			23J1379	Clamp Cap .....	.25
			23JY16	Cap Screw .....	.10
			23JY115	Nut .....	.05



Price List of Parts for Model EK Wico High Tension Magneto used on the 1³/₄, 2¹/₂, 3, 3¹/₂ and 4 Horse-Power Sizes

In ordering be sure to give the following information:

- Horse-Power.
- Engine Number.

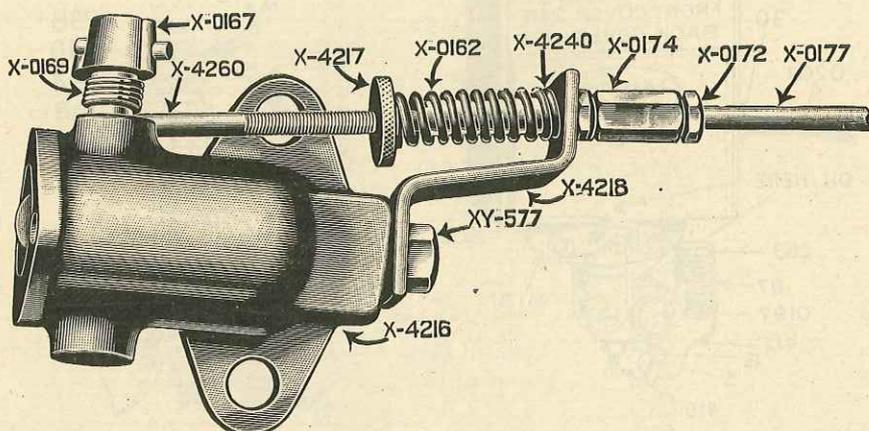
The Model, which is the letter shown after the horse-power on the name plate.

For location of parts see illustrations above. Part number in the left hand column indicates the number on the illustrations.

All magneto parts are shipped by parcel post, postage paid by us.

Part No.	Name of Part	Price
23X5	Latch Block.....	\$0.35
23X6	Latch Block Screw and Lock Washer.....	.05
23X30	Terminal Ins. Block.....	.30
23X38	Terminal Contact Spring.....	.20
23X97	Armature Return Spring.....	.40
23X132	Side Band.....	1.00
23X153	Back Cover.....	.35
23X199	Ground Connection and Side Band Screw.....	.05
23X214	Front Cover.....	.50
23X253	Return Spring Support.....	.10
23X302A	Breaker Point Nut.....	.05
23X302B	Breaker Point Nut.....	.05
23X412	Rocker Arm Group.....	1.25
23X419	Adjusting Screw, Nut and Washer.....	.20
23X502	Breaker Points (set of two with washers).....	2.00
23X505	Breaker Point Lubricating Felts (set of two).....	.10
23X513	Armature	1.75
23X0197	Rocker Arm Stud.....	.40
23X0201	Lead Wire With Terminal and Intensifier.....	.80

Speed Regulating Device



WE PAY THE POSTAGE ON ALL ITEMS ON THIS PAGE.

Part No.	Name of Part	Price
23-X-0162	Speed Adj. Spring.....	\$0.09
23-X-0167	Butterfly Damper Lever.....	.12
23-X-0169	Butterfly Damper Spring.....	.10
23-X-0172	Air Damper Rod Adj. Nut.....	.05
23-X-0174	Air Damper Rod Turn Buckle.....	.15
23-X-0177	Air Damper Rod Long Section.....	.25
23-XY-577	Hex Head Cap Screw.....	.05
23-X-4216	Damper Cage.....	.95
23-X-4217	Speed Adj. Nut.....	.11
23-X-4218	Speed Adj. Bracket.....	.12
23-X-4240	Speed Adj. Safety Sleeve.....	.13
23-X-4260	Gas Throttle Rod and Speed Change Screw....	.25

The above speed regulating device, located on the air damper rod running from the governor to the butterfly valve is used for regulating the speed of an engine so as to run as low as 400 R.P.M. or as high as 700 R.P.M.

Any speed between these two speeds can be gotten by turning and adjusting the round knurled thumb nut No. 4217.

To increase the R.P.M. speed, turn the top of knurled thumb nut No. 4217 toward you. To decrease the R.P.M. speed, turn the top of this nut toward the engine or away from you.

If you reduce the speed of an engine, you also reduce the power it will develop. Never slow the engine down on a heavy load. If you want less speed on an extraordinary heavy load, get a smaller pulley for the engine or a larger pulley for the machine being run.

*Proper Oiling Adds Years to the Life
of Your Engine*

Carefully Follow Oiling Instruc-
tions on Pages 1, 2 and 4.