enough a home looks good. Nevertheless my future home is going to be like these if possible.

I suppose you have heard about the Khaki University of Canada, which was started sometime ago by the Y. M. C. A.? It is well under way now. I cannot give any figures, but thousands of the boys are taking up different courses at the numerous branches. Every camp of any size has a branch. I am in charge of the agricultural end of this branch at Seaford, and have about 25 to 30 students coming and going. I am merely giving them a series of short courses as far as possible. This, of course, takes place during the evenings, and does not interfere with our regular soldiering. The Y. M. C. A. is certainly doing some wonderful work over here.

P. H. ASHBY.

Automobiles, Farm Machinery and Farm Motors

Cause of Compression Leaks

Common causes of compression leakage are given in the following list, together with their usual location. It is almost unnecessary to state that a leak should be repaired as soon as it develops, as it will often damage a cylinder part beyond repair if neglected for any lenght of time.

Many valves and valve seats have been ruined by long continued leaks that could have been remedied by grinding if the matter had been attended to when the leak first developed. Always pay particular attention to and inspect frequently any packed joints on the engine, as packed joints are a prolific cause of compression leakage.

A barking or blowing noise in step with the seed of the engine indicates a pressure leak and is caused by trouble in the cylinder, piston, or rings. In a bad case, smoke may be seen issuing from the open end of the cylinder in puffs that occur at each explosion while the engine is running. Leakage past the piston is often caused by the failure of the lubricating system to thoroughly oil the cylinder, the remedy is of course to increase the flow of the oil by readjusting the feed. A dry piston heats up the cylinder rapidly causes excess cylinder wear and generally makes itself known by causing pounding or groaning noise.

If a dry piston is allowed to continue it will eventually expand, and seize to the cylinder bringing matters to a sudden termination.

Do not flood the cylinder with oil in a strenuous endeavor to right matters, as excessive lubrication of the cylinder will result in foul spark plugs and igniters, and is also liable to cause preignition. Go at the job carefully. If difficulty is experienced in starting the engine, and the compression seems weak when turning over, pour a little oil in the spark plug hole, work piston back and forth, and try starting once more.

A little lubricating oil poured into the cylinder will aid starting if the compression is poor.

Holding the hand near the part where barking or blowing seems to originate will often locate an external leak. A little soapy water squirted around the joints with an oil can will indicate small leaks by bubbles caused by the escaping gas. If you are sure that the gas leaks past the piston the leak can usually be stopped temporarily by pouring a teaspoonful of graphite in the cylinder.

(a) Leaking Valves. Owing to the intense heat in the cylinder, and the action of the gases on the valves the seating surfaces become rough and pitted which causes leakage and loss of compression Exhaust Valves cause the most trouble in this respect as they are surrounded by the hot gases during the exhaust stroke and are much hotter than the inlet valves.

To determine the value of the compression, turn the engine over slowly by hand.

Leaking inlet valves usually are productive of Back Firing or explosions in the carburetor intake passages, or in the mixing valves, as flame from the cylinder leaks through the valve and fires the fresh gas in the intake.

Misfiring or loud explosions at the end of the exhaust pipe are indicative of leaky exhaust valves, if the mixture is correct and the ignition system above suspicion. Misfiring caused by leaky exhaust valves is due to combustible mixture escaping from the cylinder to the exhaust pipe and being ignited by the succeeding exhaust of the engine.

If the engine has more than one cylinder, test one cylinder at a time, opening the relief valves on the other cylinders. Now take a wrench and rotate the inlet valve on its seat, for it may be that some particle of carbon or dirt have been deposited on surface of the valve seat which prevents the valve from closing properly. Rotating the valve will usually dislodge the deposit.

Try the compression again; if there is no improvement, rotate the exhaust valve on its seat in the same manner, and repeat the test for compression. Rotating the valves in this manner will often make the removal of the valves necessary. When the valves are closed the end of the valve stem should not be in contact with the push rod, or can lever. Suitable clearance should be allowed between the end of the valve stem and the operating mechanism when the valve is closed; this clearance varies from the thickness of a visiting card on small engines to ⅛ of an inch on the large. If the valve stem is continually in contact with the push rod it cannot seat properly and consequently will leak. Wear on the valve seats and regrinding reduce this clearance, wear on the ends of valve stems and push rods from continuous thumping increases it. Keep the clearance constant and equal to that when the engine was new. On many engines this clearance is adjustable to allow for wear by lock nuts on the end of the valve stems or push rods.

If the above attempts have proved unsuccessful remove the Exhaust Valve from the cylinder, if the valve is in a cage, remove the entire cage; this may easily be done on most types of engines. Always remove the exhaust valve first as the inlet valve rarely requires attention. With small engines, and engines having the valves mounted directly in the cylinder head it will be necessary to remove the cylinder head to gain access to the valves. In such a case use care when opening the packet joint between the cylinder and head, to avoid damaging the gasket.

With the engine having the valves located in the pockets on the side of the cylinder bore remove the valve cover plate or cap situated immediately over the valve to gain access to the valves.

As the exhaust valves are always very hot in operation, the valve stems will often be found stuck to the valve guides by deposits of gummy oil, this sticking being a frequent cause of the valves not seating properly and causing leakage. Test for this sticking by removing valve spring from the stem and pushing stem in and out in the guide. If deposits are found, remove valve from guides and wash both out thoroughly with kerosene.

Corroded and rough stems will also cause sticking, and should be smoothed down with emery cloth.

Because of sticking resulting from the two preceding causes, the valve mechanism will be subjected to unusual strains that may result in bent valve stems. When a sticking valve is discovered apply a straight edge to the stem to prove the condition of the stem regarding bends and shoulder.

Side thrust produced by the cams will sometimes cause wear on the stems and guides, producing a shoulder on the stem that will prevent proper seating of the valve; reject such a valve and procure one that fits the guides properly. The continued use of an old valve with a worn stem will cause further enlargement of bore of the guides due to hammering which will eventually result in a broken stem.

The valves may not seat properly because of weak or broken valve springs. Excessive heat will take the temper out of a spring and render it useless: test them. Weak valve springs may be detected when the engine is running inserting the end of a screw driver in the turns of the coil and pressing the spring towards the collar on the valve stem. This increases the tension of the spring, and if the running of the engine is improved by the increased tension it indicates that the spring is too weak to correctly perform its duties.

Valve springs used on automatic inlet valves, or valves operated by the suction of the piston, sometimes become too weak to properly seat the valve. These springs can often be made stiffer by stretching them a trifle, after which they are replaced. Take care that the tension of the spring of the automatic inlet is not to great, as too stiff a spring will reduce the amount of mixture taken into the cylinder, about 1½ to 2 pounds is sufficient for most engines.

Examine valve spring collar or washer that forms the support of the valves on the outer end of the stem and see that it is in the proper position and supported by the key or cotter pin.

The keys and cotters used for supporting the spring sometimes shear off, or work loose, and do not allow the proper tension to be placed on the spring.

Unless a tool known as a "valve spring lifter," is used difficulty will usually be experienced in removing the spring from the stem or in replacing it. This is especially true of automobile engines where the spring is retained by pins and cotters instead of nuts. The tension of the spring should be relieved from the washer either by the "lifter" or by inserting a screw in the coils of the spring when removing or replacing spring. Be careful of your fingers when adjusting valves springs as they are stiff and capable of causing serious damage.

The exhaust valves should be lubricated with Gas Engine Cylinder Oil, never with common machine oil on account of gumming and sticking, or with gas engine cylinder oil thickened with Flake Graphite. Powdered graphite may be used with success without the addition of oil, but oil makes the application of the graphite much easier.

Farm Power Course

The Ontario Department of Agriculture is arranging for the holding of Farm Power courses; in various parts of the province. Last year a two weeks course put on at the college was largely attended. This year a two weeks course will be held at Kemptville and Guelph, a five-day course at Chatham and a two day course in various other centres. Prof. W. H. Day of the O. A. C. Staff is preparing material for the courses, and those attending will have an opportunity of becoming familiar with the vital parts of engines which are most liable to give trouble.

On many farms power is being used and a study of the engine so as to be able to make adjustments, needed repairs, etc., is essential if the engine is to be operated most efficently and economically. Engines are not fool proof but consist of many intricate parts which must be properly looked after.

These courses in farm power should be of great benefit to those who avail themselves of the opportunity to gain a working knowledge of the different kinds of farm power.

Auto Hard to Start.

EDITOR "THE FARMER'S ADVOCATE":

When answering the query by J. L. S. in your issue of November 7th. re auto that was hard to start, I mentioned the name of a particular Carbon Remover. I note you have changed this and made it read as if I was recommending Commercial Carbon Removers as a class. This however, is not the case. I have tried seven or eight different so-called carbon removers, but only one that has proven effective.

W. H. D.

THE DAIRY.

Is silage essential to modern dairying? Most milk producers will agree that it is.

Five years ago there were only 500 silos in texas: Now there are 6,625, or one for every 2000 head of stock. The silo is popular every where.

Many dairy breeders of experience are agreed that one bag of feed before calving is worth two bags after calving. Start the cow off in good condition.

The Manitoba Dairy Associaion plans a splendid show of dairy products and dairy equipement in connection with the Annual Convention of the Association, to be held in February.

The fact that a cow aborts is but a symptom of the disease itself, which is located within the uterus. Many cows that abort can be presevred as breeders by proper treatment at the time of abortion, but neglect has ruined many a cow.

If cottage cheese is to be made on the farm it is necessary to have fresh, clean skimmilk. If seperation has been hastened by adding water to the milk, good cottage cheese cannot be made.

Estimating Milk Production by Measurement

Just recently we came across a rather novel method that was in use by a European dairy farmer for testing the milk-producing capacity of cows. This farmer possessed records of from nine to twelve cows for the years 1912 to 1917, inclusive, which were, in the last two years, the best in the district. No concentrated fodder was used. In winter, merely hay and aftermath were fed twice daily; in summer, growing grass. The records show up as follows:

Year	No. of Cows	Production	Per Cent. Fat.
1912	12	2557	3.85
1913	12	3065	4.01
1914	12	2914	4.03
1915	11	2866	4.29
1916	9	3507	3 97
1917	9	3404	4.28

The following is quoted from a British publication referring to this method:

"The animals were systematically estimated by weight and measurement. For instance, the lowest mark, 1, for chest measurement was given where the width equalled one-third of the height of the withers, for each centimeter more a further mark being added. Thus, a cow 135 cm. high at the withers is marked 1 if her chest measures 45 cm., 2 if 46 cm., 3 if 47, 4 if 48, 5 if 49. This last mark is rarely attained; often not the first, in which case the cow is not further entered, the remaining body measurements not being taken. Nine of the cows on the farm in question, however, reached the highest mark, 5; other two, marks 2 and 3 respectively. It seems obvious that this unusual breadth of chest should be related to an unusual milk-giving capacity. If so, we should have further support for the theory that a large development in lung goes together with a generous production of milk."

Fixing Prices for Dairy Products.

During the four years that have passed there has been much discussion over the price which should be paid for dairy products. Consumers have naturally objected to rises in the price of foodstuffs, but farmers—and dairy farmers, in particular—have been unable to continue the production of dairy articles at former prices. The question as to how far the price of farm products