CORDS FOR SERVICE

In the 24 years since Cords Piston Ring Co. was started in England, sales have increased to more than ten times the pre-war figure, and a first-class reputation has been built up.

This has been based on the twin keystones of QUALITY and SERVICE.

THERE'S A CORDS COMBINATION

for EVERY CYLINDER CONDITION—

for EVERY TYPE OF PISTON—

for EVERY TYPE OF ENGINE—

THE ENGINEERED SET

This is the basic set offered for the majority of engines listed in this catalogue.

The rings have been specially designed to fit makers' or similar pistons (having groove widths shown in the catalogue) without either piston or rings having to be machined or modified in any way.

This applies whether the Chromo-ring set, the normal Cords re-ring set, or the Oilguard set is used, as shown opposite. All sets other than those shown as "Kit Sets" are Engineered.

RING KIT SET

Every engine type shown in this catalogue has been given a reference number. In a small number of cases it has been impracticable to make them Engineered Sets, and a Ring Kit Set will be supplied comprising all the rings necessary for the particular engine. It may, in some of these cases, be necessary to machine the piston grooves to give the most suitable width or depth to obtain best results.

Available as shown opposite.

It is our policy and aim to see that the quality of our engineering and production continue to keep ahead, and this catalogue contains details of our most recent advances, including Cords Chromo-rings. *Both the Engineer and the Motorist can be sure of Cords.*

It is our constant endeavour to maintain and improve our standard of service to the Trade. We sincerely hope you will find this Catalogue useful and interesting. If you have any particular re-ringing problem or wish for any further information, we hope you will not hesitate to get in touch with us.

THE CHROMO-RING SET

This is an Engineered Set in which the oil control ring immediately above the pin is a Chromo-ring—that is to say, whether it is a Cords segment ring or an Oilguard, it will have the top and bottom rails chrome-plated. A special dense chromium is used which gives extra long life to rings and bores.

THE OILGUARD SET

This is a ring set (Engineered or Kit Set) in which the oil control ring for the groove immediately above the pin is an Oilguard Ring. This is a ventilated ring with a serrated spacer and a number of segments appropriate to the groove width.

This set is recommended for new bores, rebores or when wear is very slight and for certain types of engines where the piston does not provide sufficient oil relief.

When o Chromo-Ring set is shown as being available the Oilguard set will ALWAYS include Chromo-Rings.

EXTRA SKIRT RING SET

This set is designed for use with Replacement pistons having an extra ring located in the "skirt" of the piston below the gudgeon pin.

Unless otherwise shown in this catalogue, the skirt ring, which is normally a slotted cast iron ring, will always be supplied to suit a groove of exactly the same width as the groove immediately above the pin.

INSTALLATION PROCEDURE

ILLUSTRATION 1

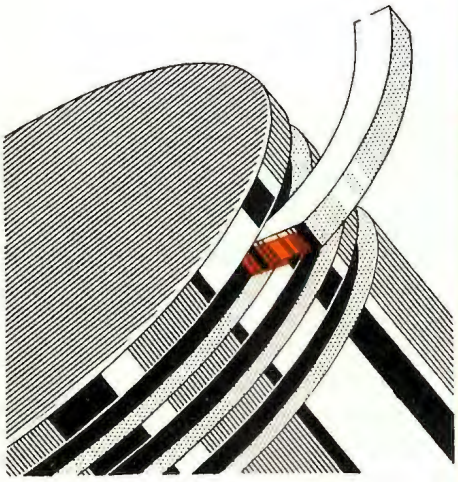


ILLUSTRATION 2

There are really only two reasons for fitting new rings to pistons of any engine—either the engine is being given a general overhaul or being rebored; or it is using too much oil, and re-ringing is needed to improve performance. Either way, the owner will be expecting quiet running, an improvement in power and performance generally and oil consumption in particular. It follows that, in carrying out the re-ringing, especially when it is not part of a complete overhaul, attention should also be given to other well-known factors which contribute to heavy oil consumption. These brief notes are suggested as a reminder of some of the most important of them—they are not intended as a "text book" for engineers.

Cylinder Head: the combustion chambers should be cleaned and preferably polished; when the head is replaced, a torque-wrench should be used for tightening the nuts (using the setting recommended by the makers) in the sequence recommended by the makers.

If the recommended sequence is not available, the procedure shown in Illustration 7 should be used.

Examine tops of pistons: an oily deposit indicates too much oil entering the combustion chamber; burnt carbon indicates a normal condition. (Do not remove pistons at this stage.) A half moon or crescent-shaped patch of oil, Illustration 1, indicates piston pumping, which can be remedied by expansion—see page 10—and fitting new rings.

Remove cylinder ridge: even if special stepped rings are to be used (normally included in most Engineered sets for other than American vehicles) the wear ridge is best removed, and it is best done at this stage so as to avoid damaging the pistons in withdrawing them through the head.

This operation is very simply carried out with the aid of Cords Cylinder Ridge Reamer—see detailed instructions on page 11.

Remove sump cover, disconnect big ends and remove pistons with con. rods (the detailed procedure for this varies slightly with different makes of vehicle, but it will usually be fully described in the maker's handbook.)

Ensure that pistons, con. rods, etc., are numbered and marked (as the cylinders, No. 1 being nearest the radiator).

Remove the old rings from the pistons, and clean the pistons thoroughly, as follows: Clean the top of the piston; remove as much of the carbon from the ring grooves as possible—use for this a piece of cast iron ring filed off to give a clean edge, Illustration 2. Soak in paraffin or other cleaning fluid, or "buff" with a fairly soft wire brush.

Check carefully for any damage, and if lands or skirt are cracked, or the sides show scuffing marks, replace the piston with a new one.

Examine cylinder walls—in the case of a cast-iron bore with a very highly glazed or mirror-like appearance this should be broken with a very light hone or a glaze buster. It is extremely important to see that the bores are *very thoroughly* cleaned after this operation.

Examine the inlet manifold (intake port) and the underside of the inlet valves; if wet oil is apparent, Illustration 3, this means that excessive oil is getting past the valve stem; in this case new valve guides and/or valves should be fitted. Valve guide seals should ALWAYS be renewed.

(*Note:* on vehicles fitted with a vacuum booster to supplement the suction from the inlet manifold and operate the windscreen wipers, a broken or faulty diaphragm will show similar wet oil conditions due to oil being sucked up from the sump, via the faulty diaphragm into the manifold. The normal symptoms associated with this are sluggish operation of the wipers and rapid and severe oiling up of the plugs associated with the vacuum system—usually No. 1 and 2 or the plugs nearest to the booster pipe/manifold junction.)

If the piston head shows wet oil and the inlet valves and manifold are dry, it is likely that oil is passing the rings. If too "cool" a plug is used, this may cause oiling up of the plugs and loss of performance; the remedy is to fit a hotter running plug in accordance with the charts of the plug manufacturers.

Check bore wear and taper, Illustration 4. If the bores show considerable corrugations, scuffing, etc. a re-bore would normally be recommended. The amount of wear and taper should be measured—see sketch.

There is usually little wear at the bottom of the piston travel, and maximum wear at the top; the difference between the diameter at these two points is termed "taper."

For best results, wear at the top of the ring travel should not exceed .004″ per inch of bore diameter—e.g., in a 2½″ bore, should not exceed .010″.

Check all bearings for wear. We would normally recommend that where it is practicable new big-end bearings should always be fitted as a matter of economy if the existing ones show the slightest signs of wear—otherwise the bearings alone will need to be replaced before the end of the life of the new rings.

Badly worn crankshaft journals or bearings can cause considerable oil consumption and loss of oil pressure.

As oil sludge in an engine prevents its proper lubrication and contaminates the new oil, it is important to clean all sludge from those parts of the engine not already cleaned (including the block). Special attention should be paid to the oil pump (a new oil filter element should ALWAYS be fitted), the crankcase breather, and the air cleaner; favourite collecting places for sludge include the timing gear case, the rocker arm compartment, around the push-rods, on the cylinder head cover.

The carburettor and choke should at least be checked to ensure correct operation—incorrect operation resulting in too rich a mixture will certainly bring about very rapid bore and ring wear due to oil dilution, as well as poor performance. Any inlet manifold drain pipe should be cleaned and checked, as, if this is blocked or not working correctly, oil dilution will result. A common symptom of this trouble is difficult starting when the engine is hot.

The cooling system should be carefully checked, Illustration 5, since if it is not operating efficiently it will result in poor engine performance. The most common faults are:

dirty and blocked water passages in engine block and radiator;

faulty thermostat(s);

worn or leaking hoses;

loose fan belt.

Any of these will result in overheating (often blamed on the new rings!) which in turn reduces the efficiency of the lubrication and may result in rapid wear, scuffing and bore distortion.

The correct procedure is to clean the engine block thoroughly (so as to prevent the possibility of particles of rust and scale causing obstruction when the engine is re-started) and to clean the radiator by reverse pressure flushing. (A special Flushing Gun, with full instructions for use, is available from our subsidiary Company, Bar's Leaks (England) Ltd., and we recommend the addition of their Non-Seepage Pellet to the coolant as a gasket seal).

It is important that a used piston should be in as near as possible to new condition—there are two parts which may be worn which can very simply be dealt with; they are:

the *piston skirt*, which plays an important part in scraping oil from the cylinder walls and in stabilising the piston and preventing 'slap.' If the skirt

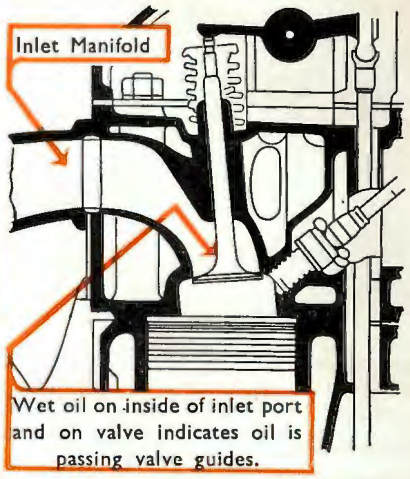
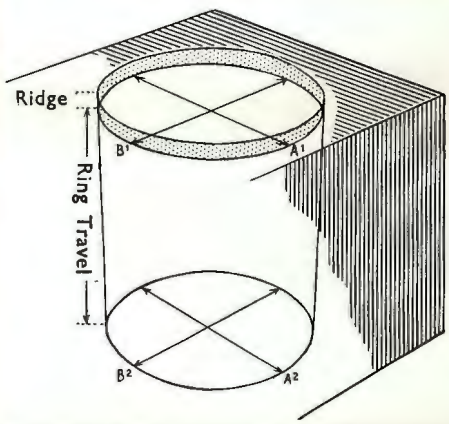


ILLUSTRATION 3



A total of four measurements should be made:

A1. At top of ring travel at right angles to crankshaft.

A2. At bottom of ring travel at right angles to crankshaft.

B1. At top of ring travel in line with crankshaft.

B2. At bottom of ring travel in line with crankshaft.

Measurement A1 less measurement A2 shows the "taper" in one direction; it should be added to the "taper" in the opposite direction and divided by two to give the "mean taper." (If a gauge is not available, insert a new compression ring and measure the end gap at A1 and A2; the difference between these figures divided by 3 gives an approximate idea of the "taper.")

ILLUSTRATION 4

INSTALLATION PROCEDURE

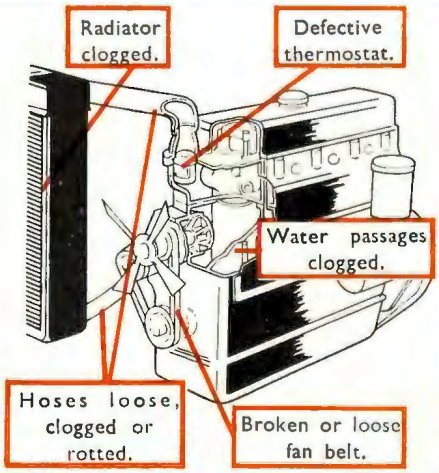


ILLUSTRATION 5

ILLUSTRATION 6

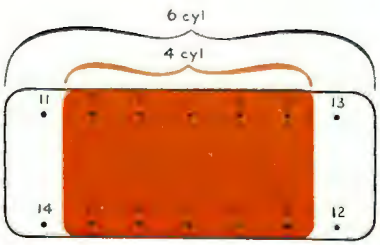


ILLUSTRATION 7

has collapsed, it can be restored to normal by the use of the appropriate piston expander (see specifications on page 10) or by Cords patented Micro-knurling process. (As a guide, if the top land above the top ring on the thrust or opposite thrust face is bright and shows signs of having been in contact with the bore, piston expansion is required).

the *top groove* of the piston; if this is badly worn it should be machined out, a groove insert fitted, and the regular compression ring used, with no fear of any further wear. For further details of Cords Groove Inserts, see page 11.

the *gudgeon pin* should be checked, and if worn, should be replaced by a new gudgeon pin, which should be oversize if necessary.

Check the alignment of the con. rods.

Fit the rings to the pistons: Detailed instructions for doing this are contained in the "Fitting Instructions" packed with each set of Cords Rings, and are set out fully on pages 7 and 8 of this catalogue.

Lubricate the piston-ring-pin-con. rod assembly: immerse the whole assembly in clean engine oil (or preferably graphited oil, if this is available).

Use a good ring compressor—Illustration 6 shows the NEW Cone Adjustable Compressor available from all Cords Dealers and Distributors, which is suitable for use with all types of pistons. The piston should slide into the cylinder—force must not be used.

Connect up each con. rod as each piston assembly is fitted—do *not* wait until all the pistons are installed before doing this—and give the crank a turn with the handle. (Should there be any undue tightness, slacken off the big end and turn over again; if it now feels free, check the big end shells or cap; in the case of the reversible type, try the other way round. Check the position of the con. rod in between gudgeon pin bosses on off-set con. rods.) Repeat this for each piston as it is installed. If after all the pistons are installed the engine does not turn over readily by hand there is something wrong, and the pistons should be disassembled and carefully checked.

Finally—we offer a GOLDEN RULE for all engine work including re-ringing—it is KEEP IT CLEAN.

RUNNING-IN PROCEDURE

Set tappets, carburettor, ignition, etc.

Check and fill cooling system, and insert Bars Non-Seepage Pellet in header tank.

Start the engine and immediately rev. at a fairly high speed (above idling speed) until normal operating temperature is reached—it is useful to cover the radiator to speed up this procedure. Do not let the engine idle at this stage, since at idling speed insufficient oil will be thrown up the bores to provide adequate lubrication.

As soon as the engine is warmed up, drive the vehicle a few miles, going through the gears in the usual way, but keeping the revs. fairly high.

As a rough guide, the engine should not go beyond about half-throttle in any gear.

On return, re-check the tappets, timing and cylinder head nuts; also check for external oil and water leaks.

The owner should drive the vehicle for 200-300 miles as though running-in a new one—that is, he should avoid overloading or overheating the engine by excessive revving at high speeds, or low speed driving in top gear; and he should avoid long periods of slow running.

The key word in running-in is MODERATION—the object is to avoid excessive revving and also excessive loading of the pistons and bearings, which results from staying in high gear at low speeds.

INSTRUCTIONS FOR FITTING RINGS TO PISTONS

Satisfactory results from fitting new rings will only be obtained if these instructions are carefully followed.

1. Clean the piston as described in the previous pages.

2. Check that the new rings you have are the correct ones for your engine; the labels on the packets in each box of rings will give details of diameter, groove width, etc.

3. Check the top groove of each piston for excessive wear, by trying a new ring in the groove and inserting a feeler gauge.

   If the wear exceeds approximately .0015″-.002″ (1½-2 thou.) the groove should be machined and an insert fitted (see detailed instructions on page 11). The compression ring supplied with the set can then be used, and there is no need to obtain a special over-width ring.

4. Check that the rings supplied for each groove are the correct depth for the groove (Illustration 8). It is important that *at least* .008″ (8 thou.) clearance should be allowed behind the ring or segment (though the clearance may considerably exceed this figure). This should be checked with a rule held along the skirt of the piston as illustrated.

Note: if a Kit Set or Cords regular segments are being used the piston grooves may need machining for width and/or depth.

5. The correct ring installation (see pages 2 and 3) will be indicated by the labels on the packets, which should be followed exactly.

6. Fitting Cupped Cords Segments:

   (a) ascertain which way each segment is "cupped"; this is done either by placing each segment on a flat surface and pressing the edge of the periphery, or by squeezing the segment to close the end gap, when the cupping will become sufficiently pronounced to be noticeable (Illustration 9).

   (b) Place the end of one segment in the first groove above the gudgeon pin with the "cupping" upwards and with the end gap over the end of the pin. Hold the end of the ring in position with the thumb and wind the ring into the groove (Illustration 10). *Never* spread a Cords segment to allow it to drop over the piston head, as with an ordinary ring.

   (c) Let the segment lie on the side of the groove nearest the gudgeon pin. Take the next segment and repeat the process but this time with the "cupping" downward and the end gap of the segment placed at the opposite side of the piston. Wind the ring into the groove letting it lie above the first segment.

   (d) Subsequent segments are fitted in a similar manner, cup up, cup down, until the groove is filled. The completed ring should then be a "sliding springy fit" in the groove. In grooves where an odd number of segments are installed the top segment is always fitted with the "cup" downwards—i.e. the top **two** segments are "cup" down.

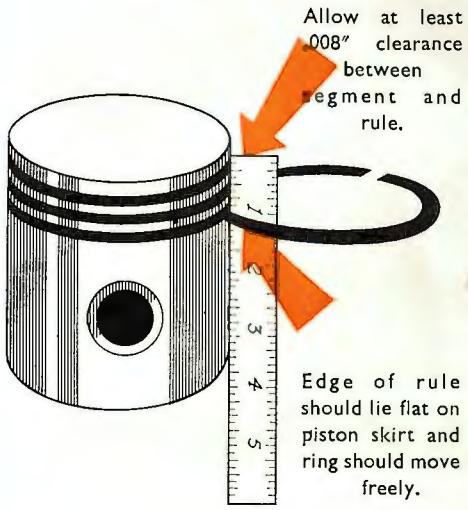


ILLUSTRATION 8

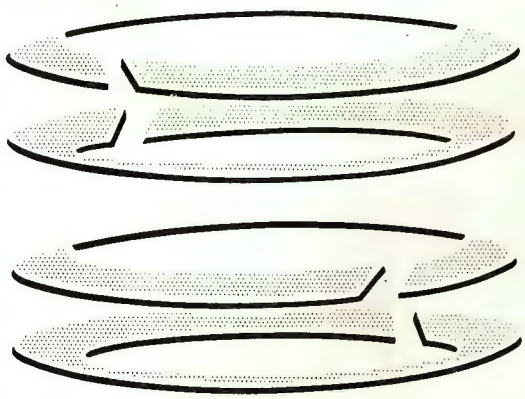


ILLUSTRATION 9

INSTRUCTIONS FOR FITTING RINGS TO PISTONS

ILLUSTRATION 10

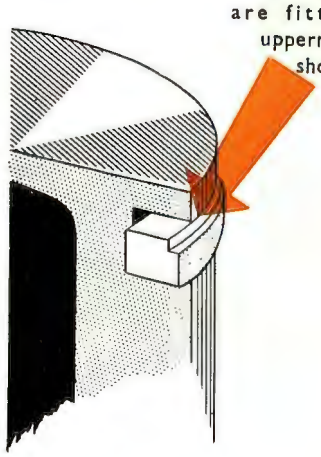


ILLUSTRATION 11

7. Oilguards.

This ring consists of a wavy spacer and a number of segments; the segments are inserted in the groove in the manner indicated in paragraph 6, but there is no need to worry about which way up they should be as they are all flat except one. The number of segments above or below the spacer will be indicated on the packet, according to the groove width as follows:—

Groove Width		*Below*	*Above*
mm.	*ins.*	*Spacer*	*Spacer*
3 or 3½	$\frac{1}{8}$	1 Segment	1 Segment
4	$\frac{5}{32}$	1 Segment	1 Segment
4½ or 5	$\frac{3}{16}$	2 Segments	1 Segment
5½	$\frac{7}{32}$	2 Segments	2 Segments
6	$\frac{1}{4}$	3 Segments	2 Segments

8. Chromo-rings:

If the oil control ring for the groove above the pin is a Chromo-ring, the top and bottom rails will be plated on the periphery; these are therefore the first and last segments to be fitted in the groove, but otherwise follow the instructions given in paragraph 6 for a Cords ring or in paragraph 7 for an Oilguard.

9. Compression and Slotted Oil Control Rings:

These should be fitted last, preferably with the aid of a ring fitting tool, to avoid the possibility of breaking a ring.

In the case of special stepped compression rings, these should be fitted only in the top groove, and with the step to the top (its object being to clear any possible wear ridge at the top of the piston travel). (Illustration 11.)

Unless specifically shown otherwise, rings fitted below the gudgeon pin are usually the cast iron slotted type (S.D.O.).

Warning: Chromo-rings should never be fitted in a chromium plated bore and Cords or Oilguard rings should be fitted in chromium plated bores only in accordance with the special layouts shown herein, or after checking with our Service Department.

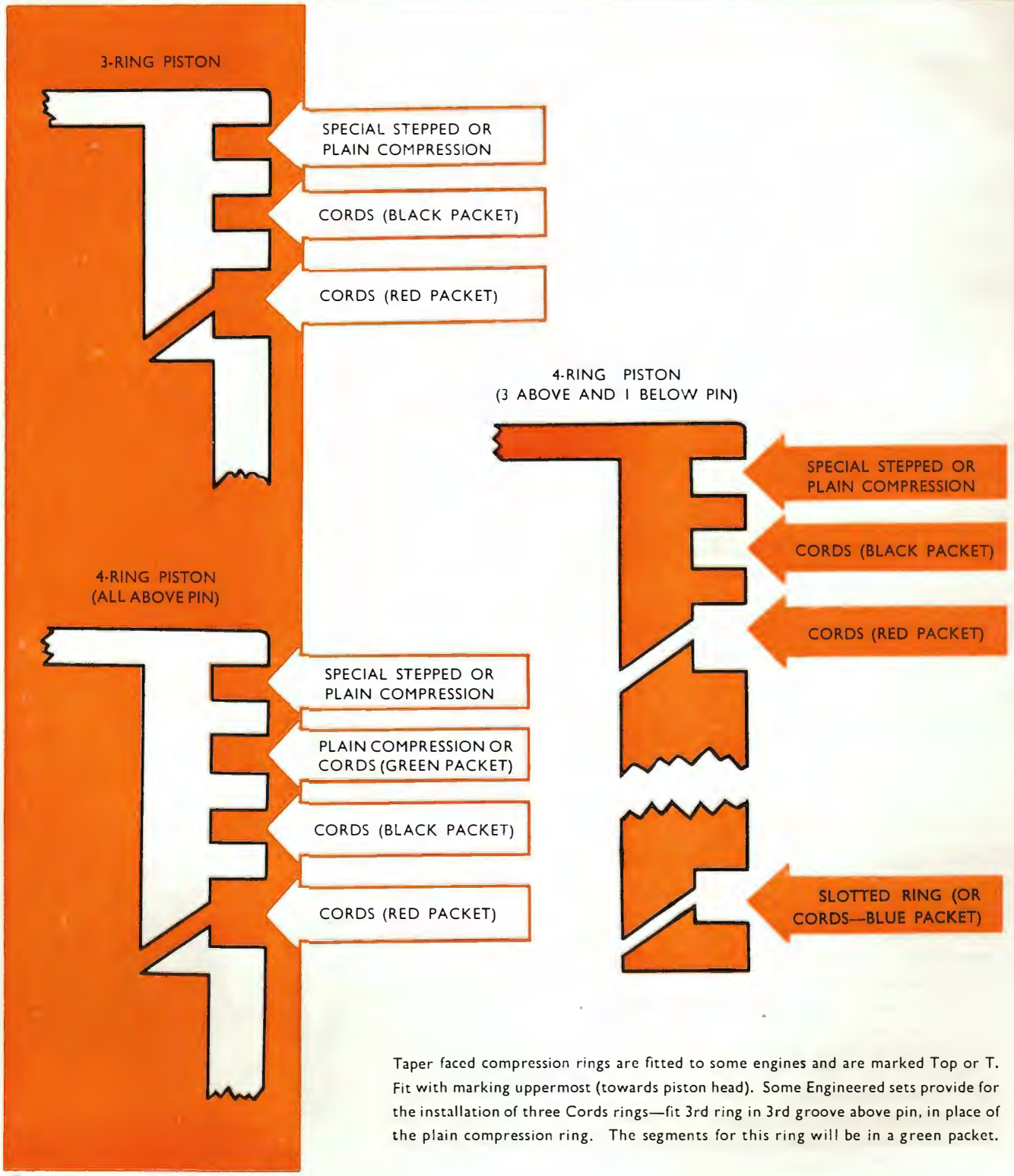
To test for chrome gently clean a small patch with a very fine abrasive and apply a piece of damp copper sulphate; chrome gives no reaction, whereas an unplated surface shows a copper coloured deposit.

Where Cords or Oilguards are fitted below the gudgeon pin, care should be taken to see that the groove is not exposed or partially exposed to a con. rod swing slot or lead-in when the piston is at the lowest point of its travel.

Special Note regarding Engineered Sets:

The segments in these sets are usually of special depth and have a special cupping suitable only for the grooves they are designed for. Care should be taken to use these segments only in the grooves indicated in each set. They should not be changed from one bag or set to another.

TYPICAL RING INSTALLATIONS



Taper faced compression rings are fitted to some engines and are marked Top or T. Fit with marking uppermost (towards piston head). Some Engineered sets provide for the installation of three Cords rings—fit 3rd ring in 3rd groove above pin, in place of the plain compression ring. The segments for this ring will be in a green packet.

PISTON EXPANDERS

CAMATIC

Camatic Piston Expanders are suitable for use in solid skirt pistons of alloy, cast iron or steel. (If size specified does not fit use next size up or down).

When in position, the curved ends of the expander fit snugly and evenly on the gudgeon pin bosses, and the hump of the expander lies in even contact with the inside of the piston skirt.

Insert the Camatic pliers (or special fitting tool) in the expander as shown in the diagram, so that the word "CAMATIC" can be read the right way up—except size F& which is other way up. This will ensure that the expander goes into the piston the right way round and will not fall out in use.

Then insert the expander with a "scooping" motion, easing the lugs of the expander round the gudgeon pin bosses; release the pressure on the pliers as soon as the expander is correctly positioned.

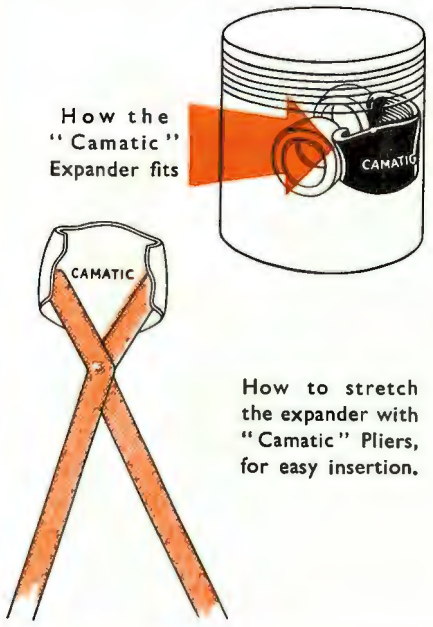
Where possible the Camatic should be inserted on the counter-thrust side of the piston, that is the nearside of the engine on R.H.D. cars.

The Camatic Expander can also be used in split skirt pistons, when it should be placed on the opposite side to the split. This also applies to most T-slot pistons, but there are some exceptions in this case, and you should check with our Service Department if in doubt.

In sets which always include a Camatic expander a small wedge-shaped tool is included (for use by the 'Do-it-Yourself' motorist). The broad end of wedge tool should be pushed through until it is just past the centre of expander, and then the same procedure adopted as described above.

Note 1: Where the special fitting tool is being used the procedure is similar to the above except that the Camatic has to be held in place with one hand while the tool is withdrawn.

Note 2: Some Camatics have the name "CAMATIC" on the outside and some on the inside; in either case, the lettering is the same way up.



How to stretch the expander with "Camatic" Pliers, for easy insertion.

FITZALL

Fitzall Piston Expanders are suitable for service in all makes and sizes of split-skirt alloy pistons.

To install:—

1. If split does not extend to the bottom of the skirt, complete it with a hack-saw blade.
2. If an expansion of more than .005″ is required, the split in the skirt must be spread and held open with a temporary wedge before drilling the hole.
3. For normal expansion drill ¼″ diameter hole in the split approximately in line with the centre of the gudgeon pin (having made sure that the Fitzall will lie flat against the inside of the piston skirt when in this position, and not foul the small end clamp bolt, if any).
4. Using the Fitzall pliers, insert the expander inside the piston skirt (before removing the wedge—if used) and engage the lugs in the ¼″ hole. The open end of the expander must point towards the piston head.

CYLINDER RIDGE REAMER

INSTRUCTIONS FOR USE

The Cords Cylinder Ridge Reamer can be used with the pistons in or out, but if they are to be withdrawn from the top, the ridge must be removed first.

To use the Reamer:

1. Adjust the locating guides by turning the centre spindle with a screwdriver until the guides will slip comfortably into the cylinder, with their shoulders resting on the top of the block.
2. Turn the centre spindle clockwise with a screwdriver until the cutter comes in contact with the ridge; then tighten further so that the tool has a slight load.
3. Insert a tommy bar in the top of the tool and turn clockwise, at the same time pressing downwards so as to overcome any tendency to tilt. Adjust the cutter after each few turns.
4. When the ridge is almost completely removed, gradually reduce the pressure on the cutter by turning the centre spindle in an anti-clockwise direction, and then give the tommy bar a few more turns.
5. Release the pressure on the cutter blade by turning the centre spindle in an anti-clockwise direction and remove the reamer. Repeat stages 2-5 for the other cylinders.

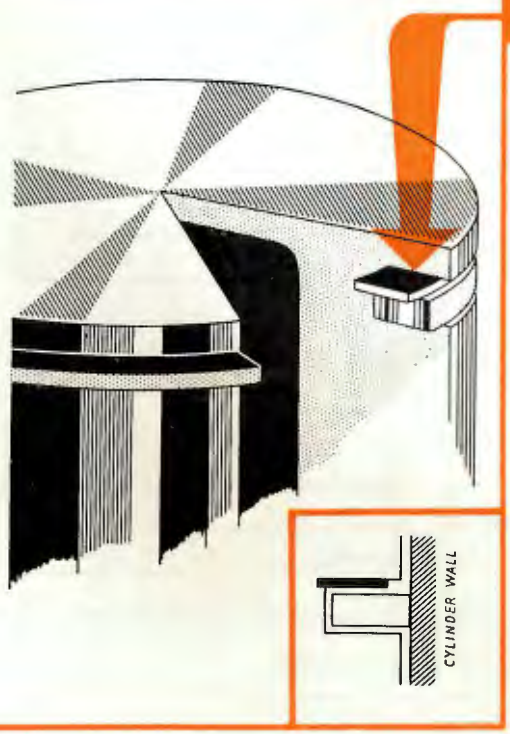
When there is a recess or chamfer at the top of the bore, so that the shoulders cannot rest squarely on the block, allow the reamer to rest on the piston crown instead of on the block, adjusting the height of the piston as necessary.

To close the reamer, turn the centre spindle anti-clockwise until the locating guides and blade carrier can be pushed home.

The hardened radii of the guide faces and the slot of the blade carrier must be kept perfectly clean. The taper face of the centre spindle must be kept lightly oiled.

Although the Cords Cylinder Ridge Reamer can be used with a spanner or socket wrench, a tommy bar is recommended because of the greater control this permits.

GROOVE INSERTS



INSTRUCTIONS FOR FITTING

These groove inserts, designed primarily for use in the top groove, are extremely valuable as a simple means of prolonging the life of a piston with a worn top groove but otherwise undamaged. Instead of discarding the piston, a groove insert is fitted which:—

enables the normal width compression ring to be used;
considerably reduces the rate of future wear on the groove.

These advantages are particularly important in the case of diesels.

The fitting is carried out as follows:—

1. Widen the groove to the nominal width plus $\frac{1}{32}$″ (the insert and a .002″ feeler may be used as a gauge).
2. Deepen the groove to the caliper size shown on the label of the groove insert, so as to obtain a correct fit of the insert on the base of the groove. To give positive location, a small register $\frac{1}{32}$″ wide and approximately .010″ deep should be machined at the top of the groove (see illustration). In this case the caliper reading is taken at the bottom of the register. We recommend this as proof against the insert creeping, but it is not essential and may be omitted at the discretion of the mechanic.
3. Fit the insert in the groove by winding it on in the same way as described for fitting a Cords piston ring segment.

Important: When the insert is in position, it should have an end gap of not less than .015″ nor more than .025″. On no account must the ends butt.

The caliper size shown on the label is the appropriate one to suit a normal groove depth in relation to the nominal diameter of the piston. If the piston has a deeper groove than usual, then the insert may have to be filed to obtain a suitable end gap. The insert should not be loose in the groove.

Groove inserts are inwardly contracting (and not outwards as piston ring segments) and each one covers a range of diameters from standard to +.030″.

CORDS REGULAR STOCK SEGMENTS

Although Engineered or Kit Sets are available for almost every engine size, some engineers may prefer to use the regular stock segments, and these will continue to be available as in the past. They are also supplied when oil control rings only are ordered.

The method of fitting is as described on pages 7 and 8 but it must be remembered that only the standard cuppings shown below will be available, and grooves may have to be machined.

Specially designed segments can be supplied whenever quantities justify.

TABLE SHOWING SEGMENT MATERIAL NORMALLY USED FOR VARIOUS DIAMETERS FROM 1¼" to 12"

Ring Diameter (inches)	Approximate Ring Diameter (millimetres)	RADIAL DEPTH .080	.090	1/10 .100	.110	1/8 .125	9/64 .148	5/32 .156	11/64 .172	3/16 .187	1/4 .250	5/16 .312
1¼–2	32– 50	.026										
1⅝–2½	41– 63		.030 .026									
2–2⅝	50– 67			.030 .026								
2⅛–3 3/16	54– 81				.030 .026							
2½–3½	63– 89					.030 .026						
2¾–4	70–101						.030 .026					
3 3/16–4 9/16	81–115							.030 .026				
4–5 1/16	101–129								.030 .026			
4 9/16–7	115–178									.026 .036		
5¼–10	146–254										.036	
7½–12	190–305											.040

The radial depth shown is that of the ring, and a minimum of .008" clearance in the grooves is recommended.

Standard segment thicknesses: .026"; .030"; .036"; .040". Tolerances: ±.001" from nominal; ±.0001" within segment.

Standard radial depths: D/30; D/28; D/26; D/24; D/22; D/20. Material: EN42E. Hardness: 477 Brinell.

TABLE SHOWING NUMBER OF SEGMENTS PER GROOVE

MATERIAL	GROOVE WIDTH 1/16	3/32	1/8	5/32	3/16	7/32	1/4	9/32	5/16
.026	2	3	4	5	6	7	8	9	10
.036	—	—	3	4	5	5	6	7	8
.040	—	—	—	3	4	5	6	6	7

The above are some standard "cuppings"—others are available for different groove widths.

WHICH SET TO USE

For new bores, after a rebore, or when wear is slight use the Oilguard set.

For worn bores, or when an Oilguard is not available use the Engineered set or Kit Set with Cupped Cords as shown in the following pages.

When available, use the Chromo-ring set.

It has these advantages:

the hard capping of chromium reduces friction still further and gives even longer bore and ring life; chromium is highly resistant to the corrosive effect of chemicals formed in the combustion chamber, especially during warming up; the top and bottom rails of the ring are plated, and the intervening rails are unplated, so that the long bedding-in period usually associated with plated rings is avoided.

Pistons with wedge-sectioned grooves.

Where a Cupped Cords ring has to be fitted in a wedge-sectioned groove, the segments are fitted in the usual way except that the bottom segment must be "cup" down and the top segment (irrespective of the number of segments in the groove) must be "cup" up so that the outside segments lie parallel with the groove lands.

Note that, due to the mouth of the groove being wider than the back of the groove, the segments may appear to be a somewhat loose fit in the groove until the ring is compressed.

SPECIAL "X" SETS

For certain vehicles where an expander-backed oil control ring is supplied and recommended by the makers, or is used in certain markets (e.g. overseas) we are able to supply special X-Sets containing the appropriate ring expanders.

Those we normally carry in stock are indicated in the appropriate columns of the catalogue.

Where a ring expander is provided it should be fitted, as the segments supplied with it will have a lower radial depth than normal segments, and will not be fully effective without the expander. For this reason, care should be taken to avoid inter-mixing the special segments with those for other grooves or other sets.

No special fitting instructions are supplied with these sets as, after the expander has been fitted, the segments are installed in the normal way. This special ring is fitted only and always in the second groove above the gudgeon pin.

HOW TO USE THIS CATALOGUE

" Oldies ": this catalogue only includes details of engines current from 1946 onwards. Earlier types are listed in our previous catalogue, copies of which are still available.

Cars, Commercials, Tractors and Engines: these are all listed in alphabetical order of makes. The only separate section is for motor cycles.

Bore Sizes: The sequence for different models under the one make is, as far as possible, in ascending size of bore diameter.

Metric/Inches: In most cases either inches or millimetres have been used for bore diameters and ring widths and the one most commonly accepted or used by the makers is shown; to avoid "clutter" the abbreviations *mm* and ″ have been omitted throughout except where they appear essential to avoid confusion.

(A simple universal conversion table is printed at the back of this Catalogue.)

Groove Widths: As far as possible, the groove widths shown are those of the maker's pistons. In all cases the sets supplied will provide rings for the grooves shown.

Set Numbers: Every engine shown in the catalogue has been given a reference number which should always be used when ordering rings. It will be seen from which of the two columns contains the reference number whether the set is a "Kit" or "Engineered" set—see pages 2 and 3.

C, OG, R, X: These columns indicate whether the set is also available:

- C — with Chromo-rings.
- OG — with Oilguards (where a Chromo-ring is available, the Oilguard will be supplied only as a Chromo-ring).
- R — with an additional skirt ring, which will be the same width as the first groove above the pin.
- X — with a special expander-backed ring for the second groove above the pin—see page 13.

One or more of these suffixes follows the reference number of the set.

Example: Set No. 5R is an Engineered Set for A50/55 with extra skirt rings.
Set No. 150G is an Engineered Set No. 15 for a Hillman with a *Chrome plated* Oilguard for the groove above the pin.
Set No. 150 OG is a set No. 150 with a Chrome-plated Oilguard.

ABBREVIATIONS

Ring Details

a	Cords are fitted in this groove (only.)
b	Ring is fitted below gudgeon pin.
h	Deep wall ring—high radial pressure.
n	State number of cylinders—set is for one cylinder.
o	Oilguard ring is included in all sets.
p	Ring gap suitable for pegged groove.
w	Wedge sectioned groove (see note p.13)
†	Not suitable for use in a chromed bore.

Set Number Suffixes

C	Chromo-ring set available.
OG	Oilguard set available.
R	Set available with extra skirt ring.
X	Special set available with expander backed ring