

SECTION L-5 PART C

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WORKSHOP INSTRUCTIONS

MOTOR CYCLE DISTRIBUTORS AND CONTACT BREAKER UNITS



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LUCAS WORKSHOP INSTRUCTIONS

MOTOR CYCLE DISTRIBUTORS AND CONTACT BREAKER UNITS

1. GENERAL

Coil ignition equipment fitted to motor cycles includes an ignition coil and either a contact breaker unit or, in the case of multi-cylinder machines, a distributor. (Details of all ignition coils are given in SECTION C-8.)

Contact breaker units are mounted either externally or internally, with respect to the engine crankcase. Models DKX1A, 15D1 and 18D1 have distributor type bodies and are mounted externally. Models CA1A, 2CA and 3CA are mounted internally—the cam or centrifugal timing control mechanism being keyed directly to an extension of the crankshaft or camshaft. Model CA1A is designed to operate at half-engine speed. Model 2CA has a lightweight centrifugal timing control mechanism for operation at engine speed. Model 3CA has no automatic timing control and can operate at either half-engine speed or engine speed.

Distributor models D1A2, 18D2 and DKX2A are fitted to two-cylinder engines, while model DKX4A is fitted to four-cylinder engines.

Most motor cycle distributors and contact breaker units have a centrifugal timing control mechanism. This mechanism is mounted immediately beneath, or behind, the contact breaker base plate (except on model 2CA units where it is mounted in front of the contact breaker) and consists of a pair of pivoted spring-loaded governor weights linked by lever action to the contact breaker cam. Under centrifugal force, due to increasing engine speed, the governor weights swing out against the spring tension and gradually advance the contact breaker cam, and thereby the spark, to suit engine timing conditions at all speeds.

Note that in model D1A2 distributors the rotor is fitted to a sleeve on the shaft and it is not possible, therefore, to check movement of the centrifugal timing control mechanism by turning the rotor. To check this movement, the contact breaker base plate must be removed.

For certain special applications, some model 18D1 and 18D2 units are fitted with oil seals both inside and outside the body shank, to prevent oil leakage from the engine crankcase.

2. ROUTINE MAINTENANCE

(a) CONTACT BREAKER GAP SETTING

Check the contact breaker gap after the first 500 miles running, and subsequently every 6,000 miles. To check

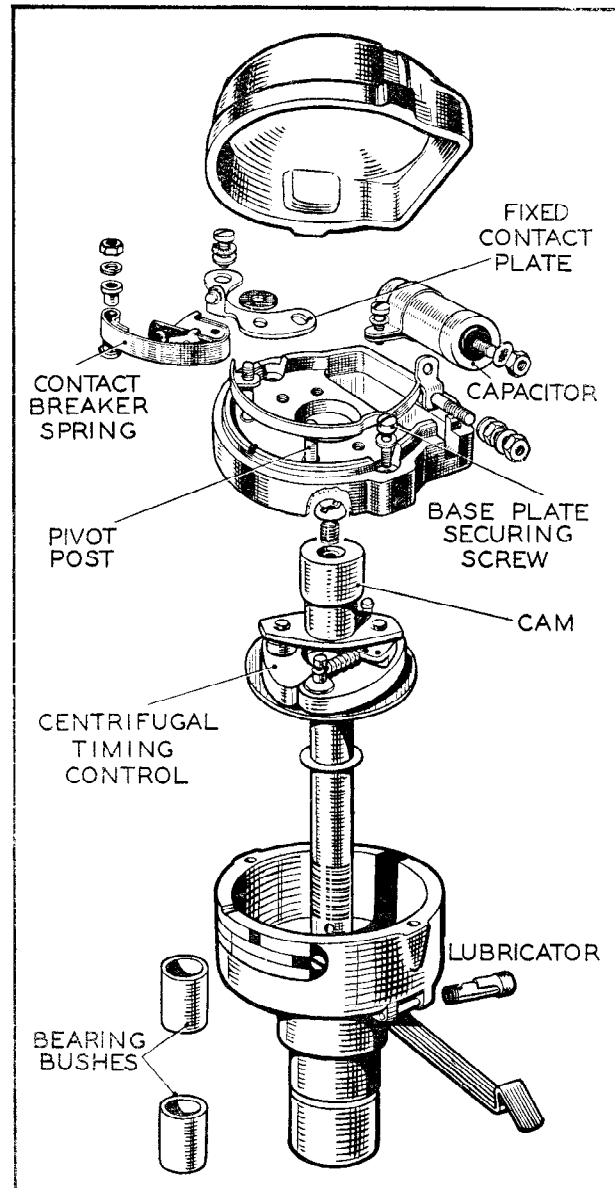


Fig. 1

Model DKX1A contact breaker unit, dismantled

the gap, crank the engine slowly until the contacts are seen to be fully open, and insert a feeler gauge between the contacts. The correct gap setting is 0.014"—0.016". If the gap is correct, the gauge should be a sliding fit.



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To adjust the gap, (all models except model 15D1) keep the engine in the position giving maximum contact opening and slacken the screw(s) securing the fixed contact plate. Adjust the position of the plate until the gap is set to the thickness of the gauge, and tighten the locking screw(s).

On model 15D1, keep the engine in the position giving maximum opening and slacken the screw at the side of the fixed contact carrier plate. Slide the fixed contact carrier in its slotted hole, until the correct gap is obtained. Retighten the screw.

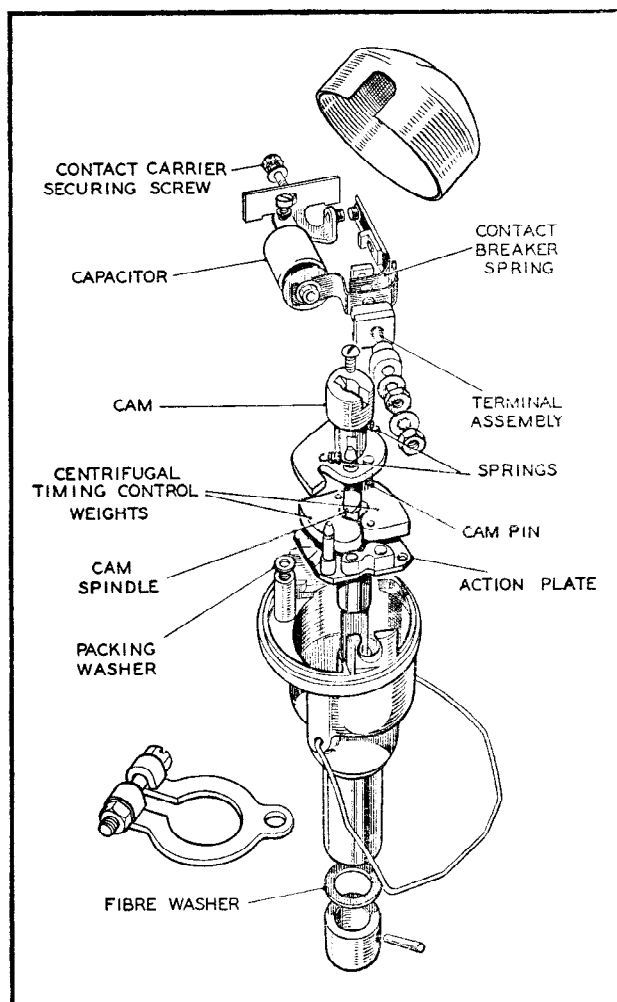


Fig. 2

Model 15D1 contact breaker unit, dismantled

(b) CLEANING—EVERY 6000 MILES

Remove and clean the cover. On twin and four cylinder units, pay particular attention to the spaces between the metal electrodes in the cover, and check that the small carbon brush moves freely in its holder.

Examine the contact breaker. The contacts must be free from grease or oil. If they are burned or blackened, clean with fine carborundum stone or very fine emery cloth, afterwards wiping away any trace of dirt or metal dust with a clean petrol-moistened cloth. Contact cleaning is made easier if the contact breaker lever carrying the moving contact is removed.

To remove the moving contact from model DKX, D1A2, CA1A and 3CA contact breaker plates, unscrew the nut securing the end of the spring and remove the nut, washer and insulation. Lift the contact breaker lever off the pivot post.

With model 2CA access to the contact breaker is gained by withdrawing the central bolt and removing the centrifugal timing control mechanism.

To remove the moving contact from model 15D1, remove the terminal nut and withdraw the nylon washer. The contact breaker spring and heel can now be lifted out of the unit body.

To remove the moving contact from models 18D1 and 18D2, slacken the contact breaker terminal nuts and remove the nut and washers from the pivot post, carefully noting the sequence of removal. Lift the contact breaker lever off the pivot post.

After cleaning, check the contact breaker setting.

(c) LUBRICATION—EVERY 6000 MILES

After cleaning the unit, lubricate as follows, taking care to allow no grease or oil to get on or near the contacts.

(i) Cam

Smear the surface of the cam very lightly with Mobil-grease No. 2 or, if this is not available, clean engine oil may be used.

(ii) Cam Bearings

Inject a few drops of thin machine oil into the rotor arm spindle.

With model D1A2, access to the bearing is gained by removing the screw at the end of the spindle.

Note: With model CA1A, the cam bearing must be lubricated every 3,000 miles. To gain access to the bearing, remove the central securing screw.

(iii) Contact breaker pivot post

Place a spot of clean engine oil on the contact breaker pivot post.

(iv) Shaft

With older units having a lubricator fitted in the shank of the unit, add a few drops of clean engine oil.



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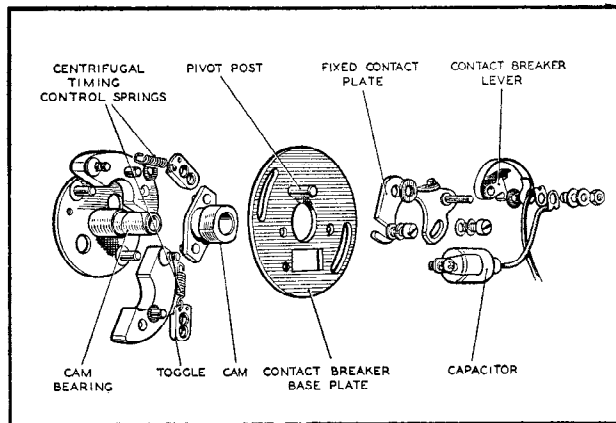


Fig. 3
Model CA1A contact breaker unit, dismantled

(v) *Centrifugal timing control mechanism:*

Models 18D1, 18D2 and DKX: Lift off the rotor arm (when fitted), and unscrew the two screws securing the contact breaker base plate to the unit body. Lubricate the centrifugal timing control mechanism, thus exposed, with clean engine oil, paying particular attention to the pivots. Refit the base plate, and secure by means of the securing screws. Refit the rotor arm.

Model D1A2: Remove the distributor unit from the engine and lift off the cover and rotor. Inject a small quantity of clean engine oil through the aperture between the cam and the base plate.

Model 15D1: Remove the contact breaker cover and use clean engine oil to lubricate the centrifugal timing control mechanism in the base of the unit.

Model CA1A: Remove the central securing screw and inject a few drops of clean engine oil into the hole thus exposed. When the securing screw has been refitted and the engine run for a few minutes, the oil will be flung out over the timing control mechanism by centrifugal action.

Model 2CA: Lightly lubricate the mechanism with clean engine oil.

(d) **RENEWING HIGH TENSION CABLES**

When high tension cable shows signs of perishing or cracking, renew using 7 mm. p.v.c.-covered or neoprene-covered rubber ignition cable.

To fit new cable to distributors having vertical outlets similar to those illustrated in Fig. 6, pull the old cable and connector from the socket in the distributor cap and fit a new connector with each new cable.

3. DESIGN DATA

- (a) Contact breaker gap: 0.014"–0.016".
- (b) Contact breaker spring tension: 18–24 oz. (except model 15D1, which is 14–20 oz.).
- (c) Capacitor: 0.18–0.23 microfarad (0.14–0.20 microfarad for models 18D1 and 18D2).
- (d) Centrifugal timing control: Refer to Publication SB222 (against the appropriate Service No.) for details of operating range, etc.

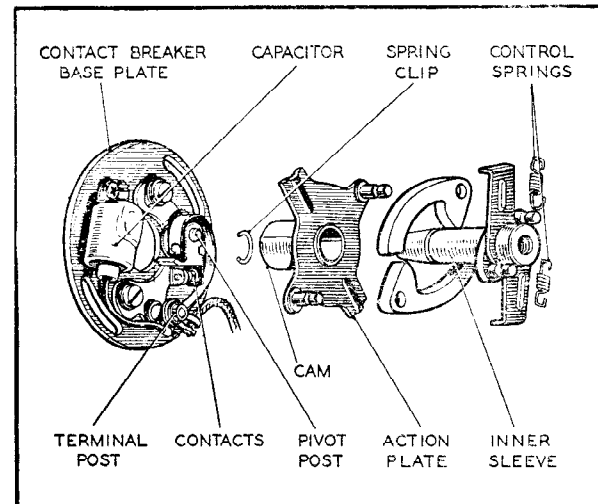


Fig. 4
Model 2CA contact breaker unit, dismantled

4. SERVICING

Before testing the ignition system, check that the battery is in good condition.

(a) **CHECKING LOW TENSION CIRCUIT**

(i) Examine the contact breaker, checking the gap setting and measuring the contact breaker spring tension.

(ii) Switch on the ignition, slowly crank the engine and observe the ammeter pointer. If the ammeter reading rises and falls with the closing and opening of the contacts, the low tension wiring is in order. If the reading does not fluctuate in this way, a short circuit in the low tension wiring is indicated.

When no reading is given, a broken or loose connection in the low tension wiring is indicated.

(iii) To trace a fault in the low tension wiring, switch on the ignition and crank the engine until the contact breaker opens. With the aid of a voltmeter (0–10



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volts), make a point-to-point check around the low tension circuit using the appropriate wiring diagram for the machine. Check the capacitor and the ignition coil by substitution.

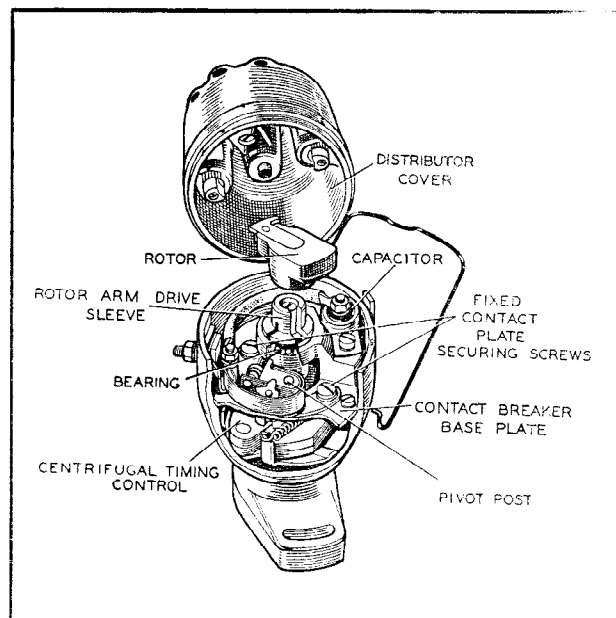


Fig. 5

Sectioned view of model D1A2 distributor

(b) CHECKING HIGH TENSION CIRCUIT

(i) If the fault is not in the low tension circuit, remove the coil lead from the sparking plug (single-cylinder machines) or distributor, and place the end removed about $\frac{3}{16}$ " from the cylinder. Switch on the ignition and crank the engine until the contacts close. Flick open the contacts, when a strong spark should be obtained. If no spark occurs, this indicates the coil to be faulty.

(ii) When applicable, clean and examine the distributor moulded cover for free movement of the carbon brush. If a replacement brush is necessary, it is important that the correct type is used. If tracking has occurred, indicated by a thin black line between two or more electrodes or between one of the electrodes and the body, fit a replacement distributor cover.

(iii) Examine high tension cables carefully and replace as necessary.

(c) DISMANTLING

When dismantling, carefully note the positions in which the various components are fitted, in order to ensure their correct replacement on reassembly.

If the driving dog or gear, when fitted, is offset or marked in some way for convenience in timing, note the relation between it and the rotor electrode and maintain this relationship when reassembling the distributor. The extent to which the unit requires dismantling naturally depends on the repair required.

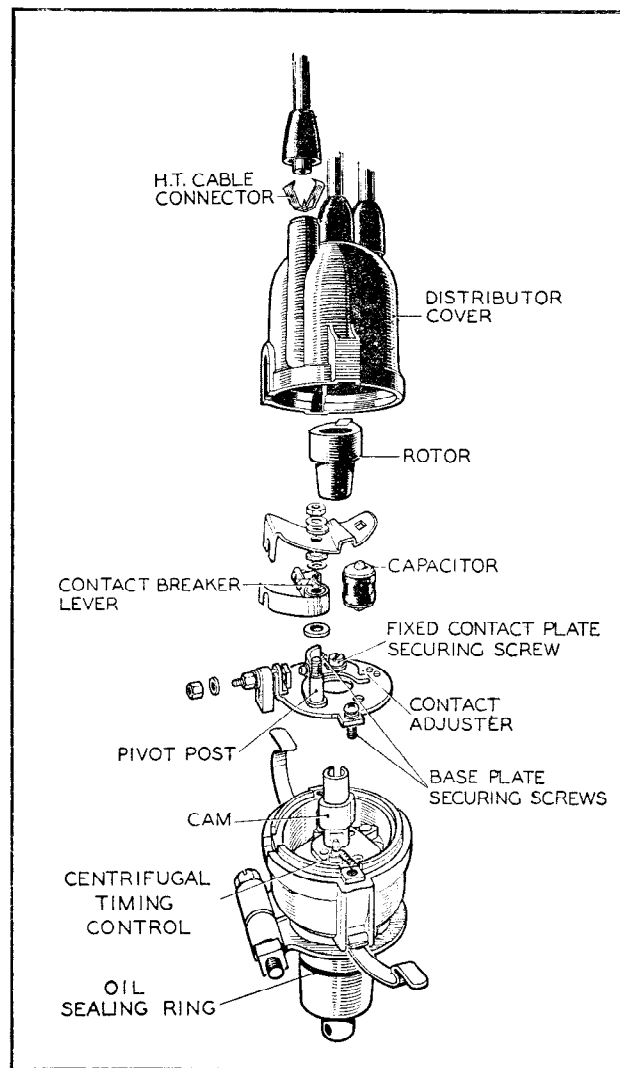


Fig. 6

Model 18D2 distributor, dismantled

(d) BEARING REPLACEMENT

Earlier model DKX contact breaker units have two porous bronze bearing bushes (see Fig. 1), while more recent units of the same type have a single porous iron bearing bush (see Fig. 7). A badly worn bearing (or bearings) is indicated by the maximum opening of the contacts varying considerably when the shaft is slowly rotated by hand and side pressure is applied to the



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cam. If a bearing bush has to be removed for *any* purpose, a new bush (or bushes) must be fitted when the unit is assembled.

Use a hand press to remove the bush (or bushes) from the shank of the unit.

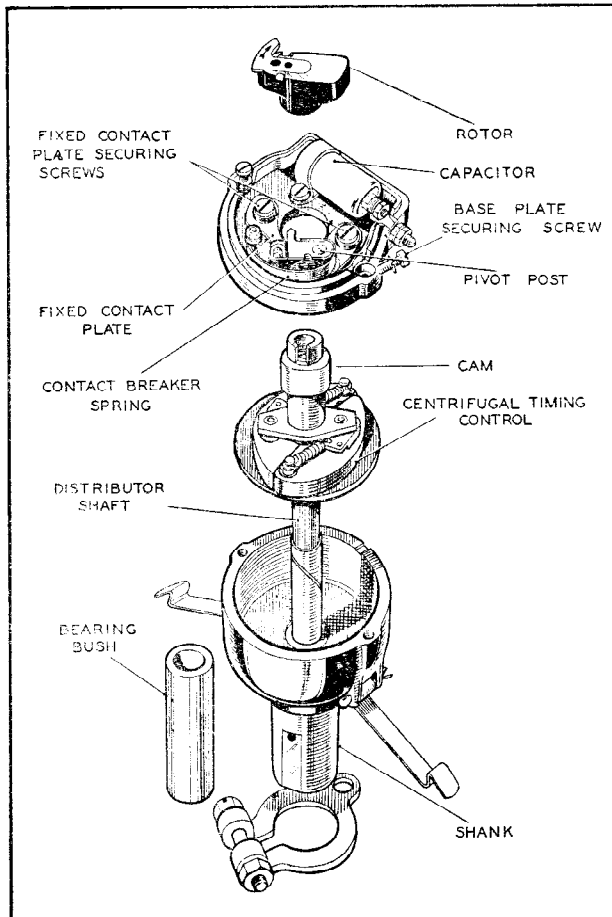


Fig. 7
Model DKX2A distributor, dismantled

Prepare new bushes for fitting by immersing them in medium viscosity (S.A.E. 30-40) engine oil for at least 24 hours. In cases of extreme urgency, this period of soaking may be shortened by heating the oil to 100° C. for 2 hours, then *allowing the oil to cool before removing the bush*. Use a shouldered mandrel to press the new bearing (or bearings) into the shank. The mandrel should be hardened and polished, and 0.0005" greater in diameter than the shaft. To prevent subsequent withdrawal of the bush with the mandrel, fit a stripping washer between the mandrel shoulder and the bush as shown in Fig. 8.

Under no circumstances should the bush be over-bored by reamering or any other means, since this will impair the porosity and thereby the effective lubricating quality of the bush.

Models 15D1, 18D1 and 18D2 have special bearings and, when they become worn, a new body must be fitted.

The ball bearing in model D1A2 units may be removed by means of a normal extractor.

(e) OIL SEAL REPLACEMENT

The oil sealing ring fitted in a groove round the shank of certain 18D1 and 18D2 units is simple to replace, but the oil seal sometimes fitted inside the shank requires the use of a suitable extractor to remove it from its housing.

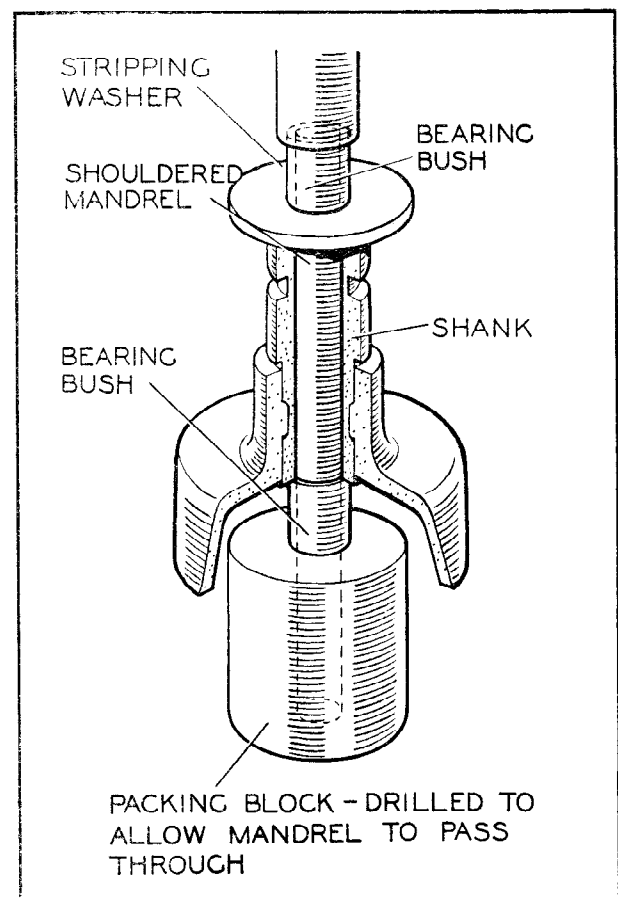


Fig. 8
Fitting new bearings to earlier type DKX contact breaker unit or distributor



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If an oil seal has to be removed for any reason take great care to avoid damaging the rubber sealing surfaces.

(f) REASSEMBLY

Reassembly is a reversal of the dismantling procedure, observing the precautions mentioned in para. 4(c). Note

that with most units an insulating washer must be placed over the contact breaker pivot post before the contact breaker lever is fitted.

Lubricate the various moving parts in the unit and set the contact breaker gap as described in para. 2.

METRIC EQUIVALENTS

0.0005" = 0.013 mm.

0.014" = 0.356 mm.

0.016" = 0.406 mm.

$\frac{3}{16}$ " = 4.763 mm.

500 miles = 804.6 Km.

3,000 miles = 4828 Km.

6,000 miles = 9656 Km.

14 oz. = 397 g.

18 oz. = 511 g.

20 oz. = 566 g.

24 oz. = 680 g.

