CHARACTERISTICS

DISTRIBUTOR.
Make : DUCELLIER or FEMSA.

Type of engine	Type of vehicle	Date produced	Initial advance	Advance curve	Maximum centrifugal advance	Centrifugal advance check with device 1692-T *Needle in ZONE*
A 53 (425 cc)	AZ (series A and AM)	*3.1963 → 2.1970*	12°	A	6° to 8°	« AZB »
	AZU	*3.1963 → 8.1967*				
A 79/0 (425 cc)	AZU	*8.1967 → 3.1972*	12°	B	7°30' to 12°30'	Between « AZB » and « AZP »
	AYA (series A and AM)	*8.1967 → 3.1968*				
A 79/1 (435 cc)	AYA 2 (series A and AM)	*3.1968 → 2.1970*	12°	C	10° to 15°	« AZP »
	AZ (series A 2 and KB)	*2.1970 → 9.1978*				
	AZU	*8.1972 → 2.1978*				
M 4 (602 cc)	AYA 3 (series A and AM)	*1.1968 → 10.1968*	12°	A	6° to 8°	« AZB »
	AK and AMI 6	*→ 5.1968*				
M 28/1 (602 cc)	AYB (series A and AM)	*10.1968 → 2.1970*	8°	C	10° to 15°	« AZP »
	AZ (series KA)	*2.1970 →*				
	AY (series CA)	*10.1968 →*				
	AK (series B)	*5.1968 → 7.1970*				
	AK (series AK)	*7.1970 → 2.1978*				
	AY (series CD)	*2.1978 →*				
M 28 (602 cc)	AMI 6	*5.1968 → 3.1969*	8°	C	10° to 15°	« AZP »
	AY (series CB)	*2.1970 →*				
	AMI 8 All types	*3.1969 →*				

Contact breaker gap : 0.35 to 0.45 mm (.014 to .018 in).
Dwell angle :
- *Distributors fitted up to February 1970* : 144° ± 2° (Dwell ratio : 80 % ± 2 %)
- *Distributors fitted since February 1970* : 109° ± 3° (Dwell ratio : 60 % ± 2 %)

COILS :
Make : DUCELLIER
- 6 Volt circuit : Reference 2768 - 12 Volt circuit : Reference 2769

Make : FEMSA
- 12 Volt circuit : Reference BC 12-4.

Supplement No. 1 to Manual 816-1 (CORR)

SPARKING PLUGS.

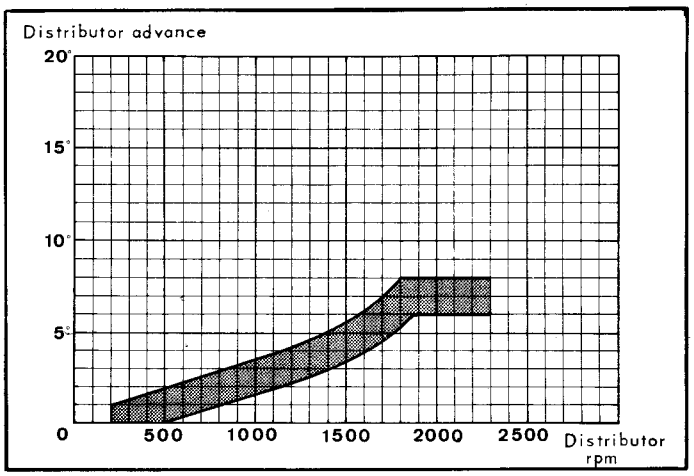
Refer to the Technical Bulletins, appearing periodically, for recommendations as to the type and make of sparking plugs to be used.

CONDENSER.

Capacity : 0.18 to 0.28 μ F.

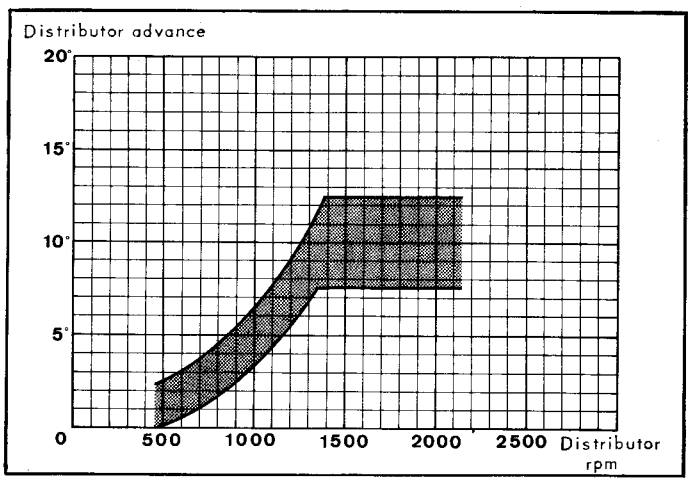
CENTRIFUGAL ADVANCE CURVES.

A. 21-54



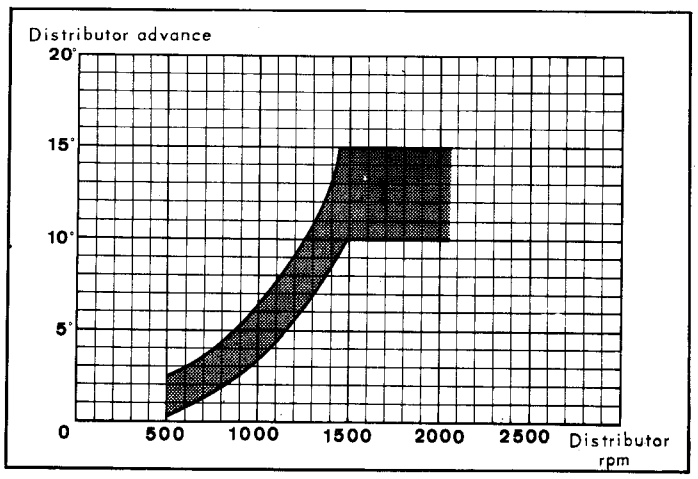
CURVE A

A. 21-52



CURVE B

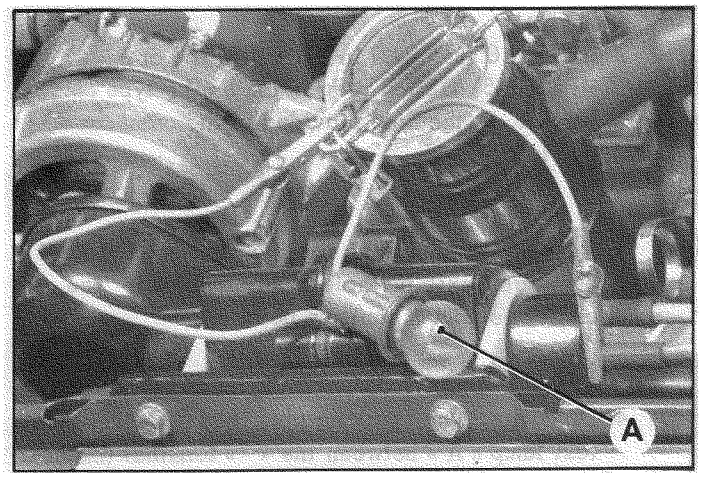
A. 21-53



CURVE C

I. CHECKING THE IGNITION TIMING.

5135



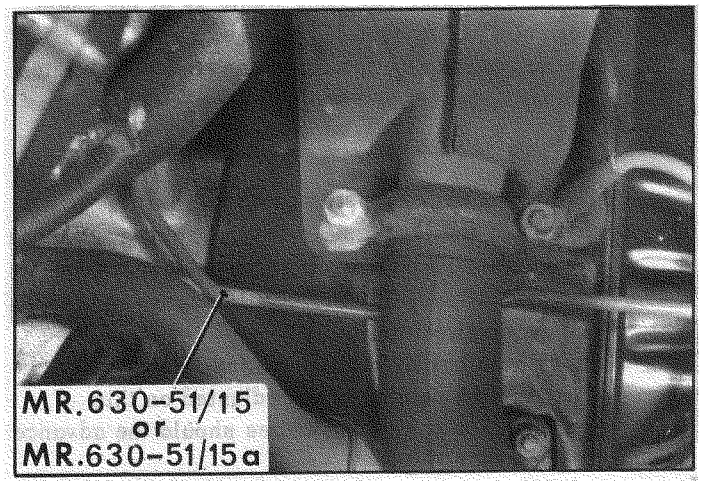
1. Connect a test lamp A between the « - » terminal (blue mark) of the ignition coil and the earth (the oil filler cap for example).
Disconnect the sparking plug leads.

2. Turn on the ignition switch.

3. Insert a 6 mm (0.23 in) diameter timing rod or a MR. 630-51/15 rod (for engines A 79/1, M 28/1 or M 28) in the hole provided in the crankcase (L.H. side). Pass the rod between the exhaust pipe and the cylinder head.
Bear the rod against the flywheel.

4. Turn the engine in the normal direction using the flywheel. At the precise moment when the rod enters the hole in the flywheel (ignition point) the test lamp should light up. If the lamp lights up before the ignition point (advance) or after this point (retard) by an angle superior to 1° (2/3 of a tooth or of a tooth space on the starter ring), the ignition point must be adjusted.
At ignition point setting make a mark on the crankcase and another directly opposite, on the flywheel.

4514

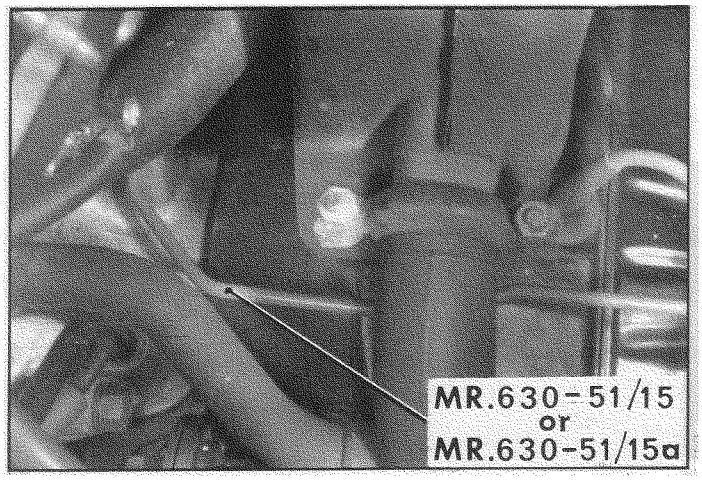


5. Carry out the same check for the other cylinder: turn the flyweel in the normal direction. At ignition point setting, make a mark on the flywheel, directly opposite to the one initially taken on the crankcase.
If there is a clearance of more than 3° (a tooth and a tooth space on the starter ring) remove the distributor and replace the cam.

6. Switch off the ignition, *remove the timing rod* and test lamp A.
Connect the sparking plug leads.

II. ADJUSTING THE IGNITION TIMING.

4514

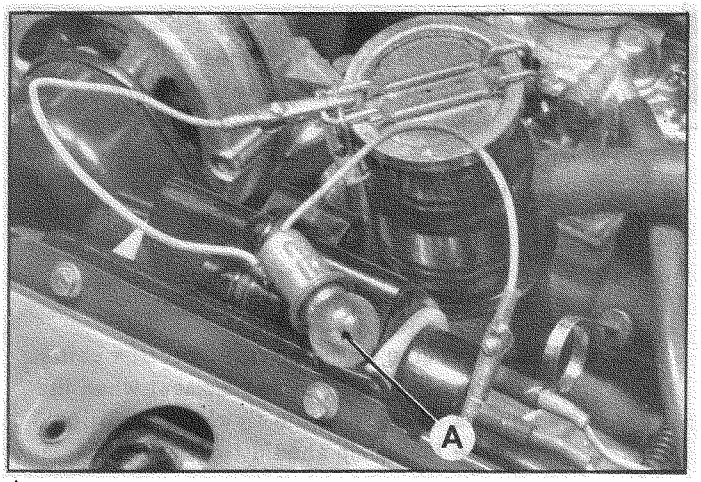


1. Remove the grill.
   Remove the fan (extractor 3006-T bis).

2. Insert a 6 mm (0.23 in) diameter rod or a MR. 630-51/15 rod, depending on the type of vehicle, in the hole provided in the crankcase (L.H. side).

3. Turn the engine using the flywheel until the rod penetrates into the hole of the flywheel. The engine is now at ignition point.

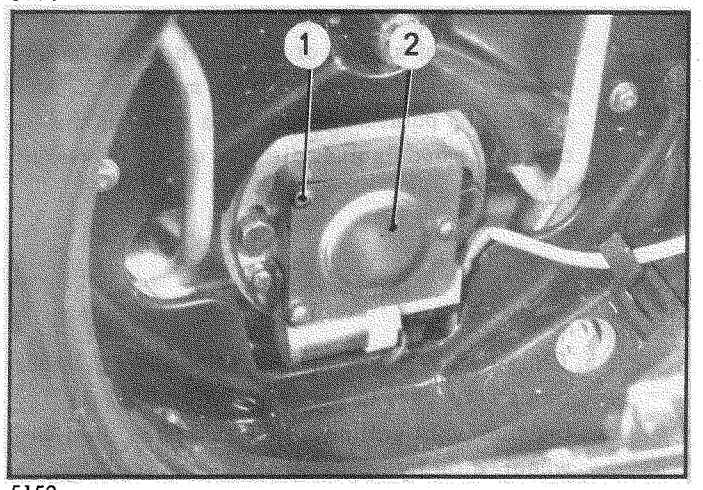
5135



4. Disconnect the sparking plug leads. Connect a test lamp « A » between the « - » terminal (marked blue) of the ignition coil and the earth (the oil filler cap for example). Switch on the ignition.

5. Remove the three screws (1) and the cover (2) from the distributor. Check that the advance weights are in their « rest » position.

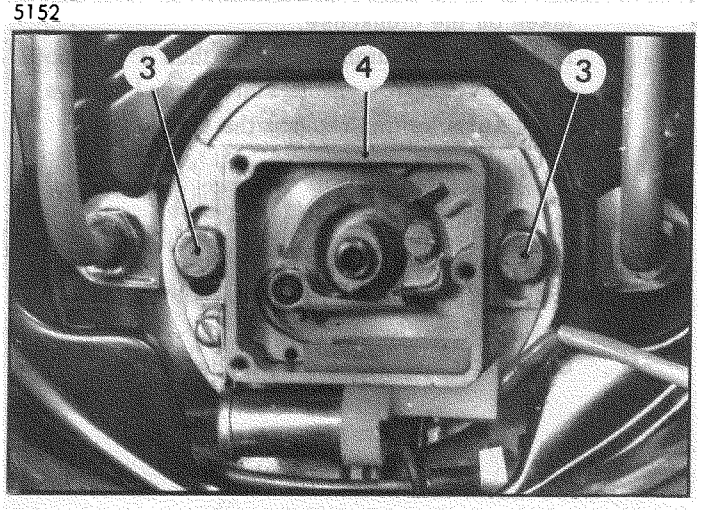
5114



6. Loosen the two securing screws (3) of the distributor.
   Slowly turn the casing (4) until the contact points seperate. The lamp lights up at the exact moment of seperation. Tighten screws (3). Fit the cover (2) with the three screws (1) (serrated washer under screw head). *Remove the timing rod.*

7. Rotate the engine (using flywheel) in the normal direction, the lamp goes out. Stop rotating as soon as the lamp lights up again (the motor has completed one revolution). The rod should engage in the engine flywheel hole.
   If the hole has by-passed the rod, there is retard. The ignition point must be adjusted on this cylinder ; in no circumstances should the advance be less than :
   12° (engines A 53 - A 79/0 - A 79/1 - M 4)
   8° (engines M 28/1 and M 28)
   There should be no more than a 3° clearance (a tooth plus a tooth space on the starter ring) between the ignition points of both cylinders. Otherwise, replace the cam.

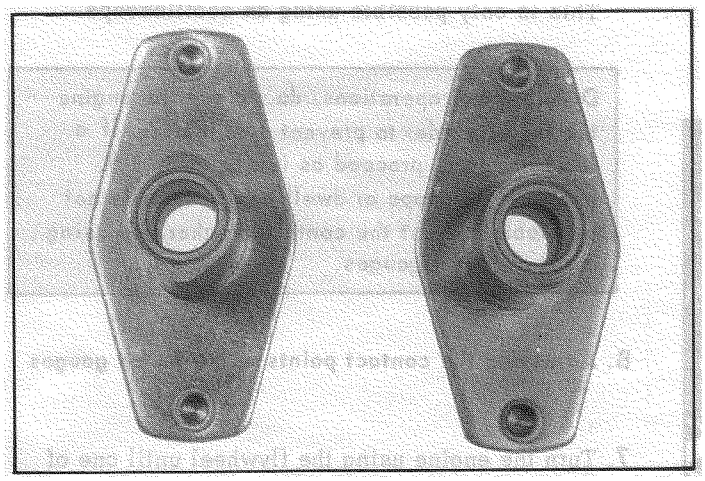
5152



8. *Remove the timing rod.*
   Fit the fan and grill.

III. CHECKING THE CONTACT POINT GAP.

8383



Former cam **New cam**

NOTE : The new cam is intercangeable with the old one.
The Replacement Parts Department only supplies the new model.

This check cannot be carried out without disassembling except by utilizing a large screen oscilloscope, a Dwell-angle meter, or a Dwellmeter.

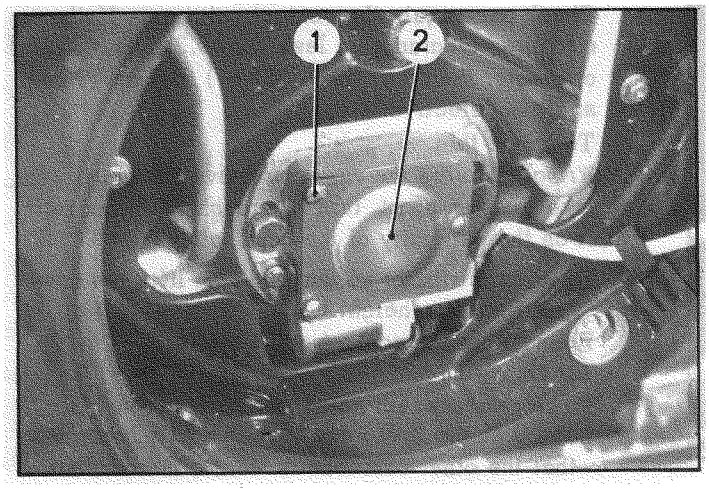
The dwell-angle of the contact breaker should be ;
- *144° ± 2° (Dwell ratio : 80 % ± 2 %)* ⟶ *2/70,*
- *109° ± 3° (Dwell ratio : 60 % ± 2 %) 2/70* ⟶ *and on vehicles produced before which have been fitted with the new cam.* The corresponding contact point gap is :

0.4 ± 0.05 mm (.015 ± .0019 in)

On the same distributor there should be no more than a 1° 30' difference between the dwell angles of the two cam bosses.

IV. ADJUSTING THE CONTACTS POINTS.

5114



Manual 816-1

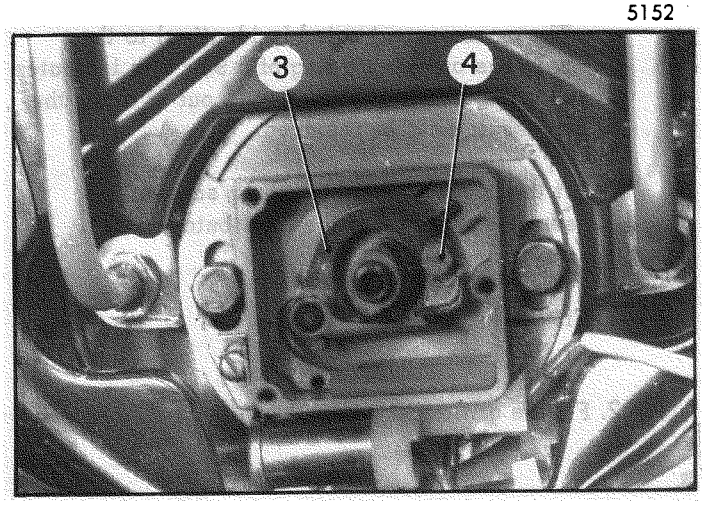
1. Remove the grill.

2. Remove the fan (extractor 3006-T bis).

3. Remove screws (1) and cover (2) from the distributor casing.

Check the condition of the contact points : if there is crater formation, the points must be replaced (see corresponding operation) and the condenser must be checked.

5152



A. Adjusting the contact points using checking devices :

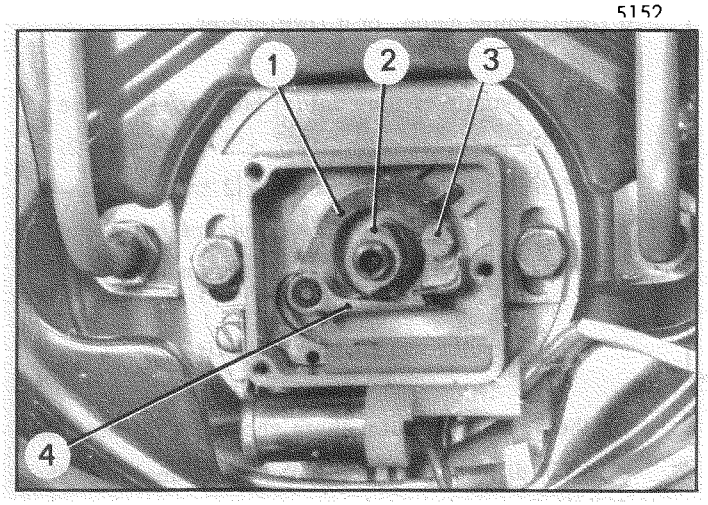
4. Connect an oscilloscope or a dwell angle meter.

5. Start the engine. Untighten screw (4) and move the fixed contact support (3) in the required direction to obtain a Dwell angle of *144° ± 2° (Dwell ratio : 80 % ± 2 %) or 109° ± 3° (Dwell ratio 60 % ± 2 %) depending on vehicle (see chapter III, above).*
Tighten screw (4).
Check again and adjust if necessary.

6. Check the dwell angle on both bosses of the cam. This is only possible using an oscilloscope.

During these operations, do not run the engine too long in order to prevent overheating. If a fault is noted, proceed as indicated in § 9. If an oscilloscope or dwell-angle meter is not available, adjust the contact breaker gap using a set of feeler gauges.

5152

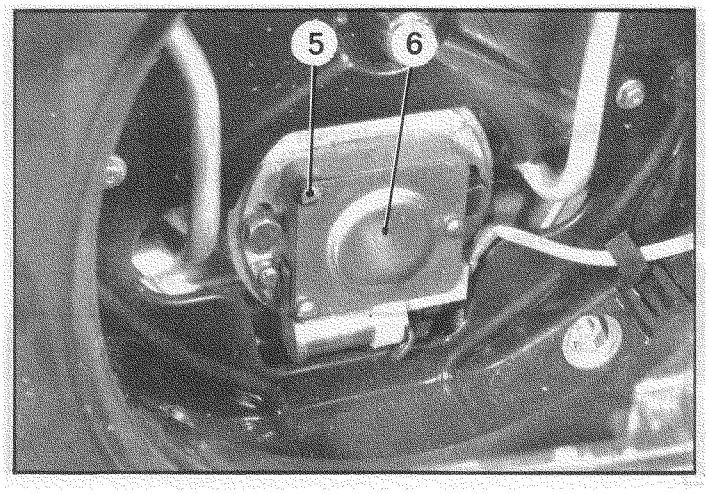


B. Adjusting the contact points using feeler gauges :

7. Turn the engine using the flywheel until one of the bosses of cam (2), lifts arm (4) to its maximum height.
At this point the contact point gap should be 0.4 mm (.015 in). If not, untighten screw (3) and move the fixed contact support (1) in the appropriate direction until the correct gap is obtained.

8. Moderately tighten screw (3).

5114



9. Turn the engine so that the second boss of cam (2) lifts arm (4) to its maximum height.
Check once again the contact point gap. If the measured clearance is less than 0.35 mm (.013 in) or greater than 0.45 mm (.017 in) the cam or camshaft is defective.
To check this :
Without turning the engine, remove the distributor take the cam apart, turn it through 180° and refit it on the extremity of the camshaft.
Fit the distributor so that the cam lifts the arm to its maximum height.
Re-measure the contact point gap.
1st case :
- The measurement noted is now between 0.35 and 0.45 mm (.013 and .017 in): this indicates that the other cam lobe is worn ; the cam has to be replaced.

2nd case :
- The measurement noted is identical to the previous one (beginning of § 9) : this indicates that the camshaft extremity is out of true ; the camshaft must be replaced.

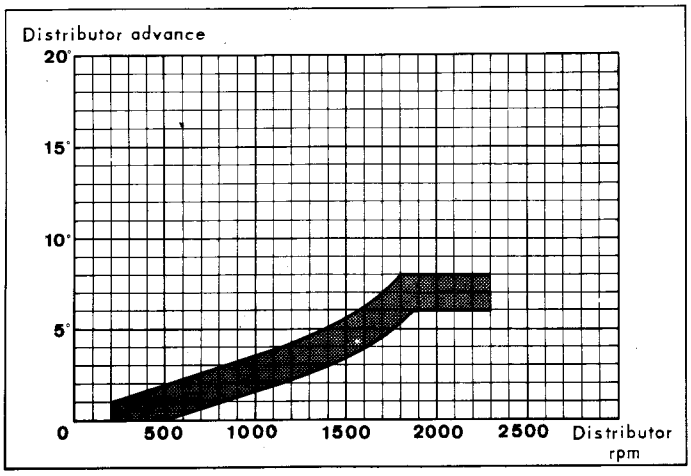
10. Fit the cover (6) and the three screws (5) (serrated washer) to the distributor casing.

11. Fit the fan.

12. Fit the grill.

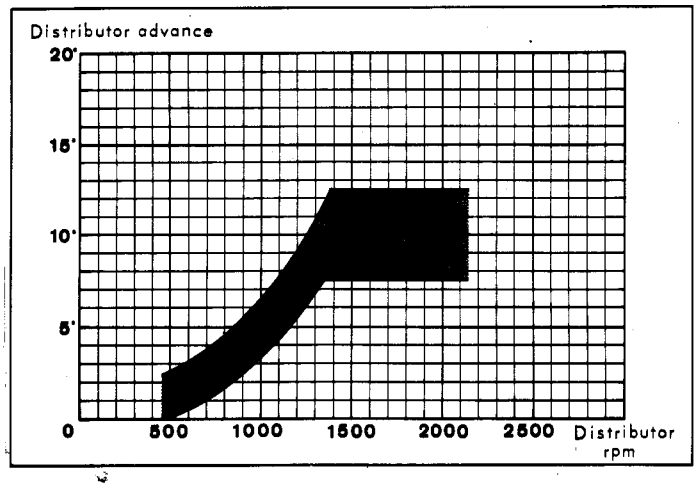
V. CHECKING THE CENTRIFUGAL ADVANCE CURVE.

A. 21-54



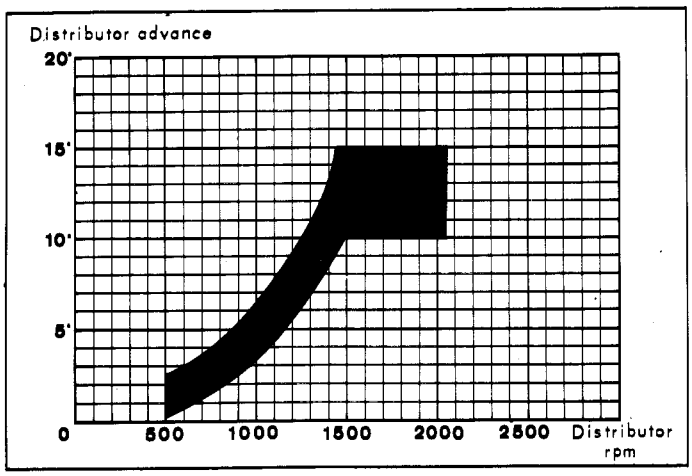
Curve A

A. 21-52



Curve B

A. 21-53



Curve C

Without disassembling, this check can only be carried out with a strobe lamp, an angle dephaser and a tachometer.
A mark should first be made on the flywheel and on the crankcase at ignition point.

For the correspondance between engines and vehicles see the table given in *Operation A. 210-00*

Curve A :
- Engines A 53 and M 4

Curve B :
- Engine A 79/0

Curve C :
- Engines A 79/1 - M 28/1 and M 28.

1. **Find the ignition point position :**
Connect a test lamp between the « - » terminal (blue mark) of the ignition coil and the earth (oil filler cover for example).
Disconnect the sparking plug leads :
Turn the ignition on.
Run the engine in the normal direction using the flywheel. At the precise moment when the lamp lights up, make a mark on the flywheel and another directly opposite on the crankcase (for example : draw a line on a label and stick it on the coupling bracket to the gearbox).

2. Disconnect the test lamp. Connect the sparking plug wires.

3. Fix the strobe lamp, dephaser and tachometer in position.

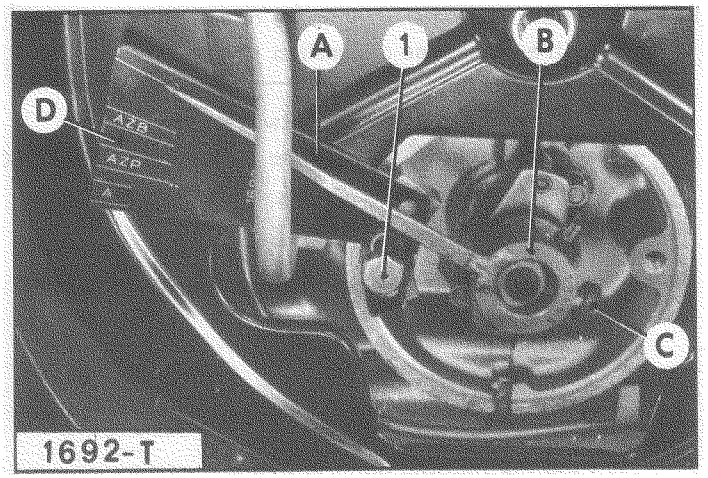
4. Start the engine and check the curve. If the curve is incorrect, adjust the centrifugal advance or replace the earths.

5. Stop the engine. Remove the strobe lamp, dephaser and tachometer.

If a strobe lamp or dephaser is not aavailable, it is possible to check the maximum centrifugal advance (see chapter VI, same operation).

VI. CHECKING AND ADJUSTING THE MAXIMUM CENTRIFUGAL ADVANCE.

4263



1. Remove the grill.

2. Remove the fan (extractor 3006-T bis).

3. Remove the distributor.

4. Secure the graduated section A of the 1692-T device using the distributor securing screw (1).

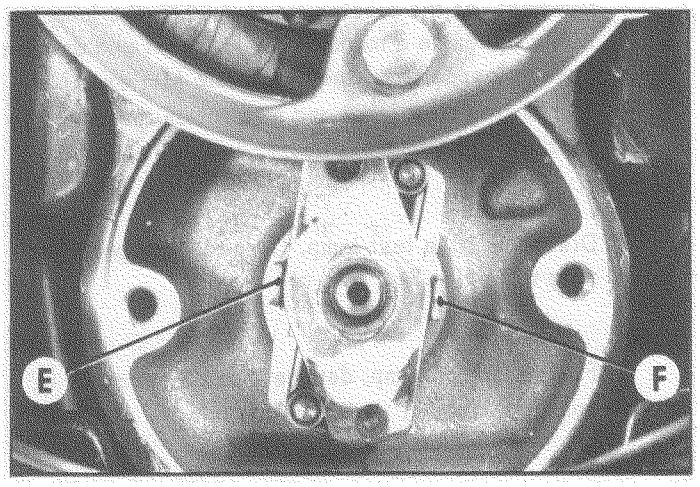
5. Fit the needle-holder B to the cam by pushing it right home and slightly tighten the securing screw C.

6. Turn the flywheel to bring needle across the reference point « O ».

7. Turn the needle holder, without forcing, from right to left.
   At the end of its travel the needle should face the :
   a) « **AZB** » zone, for distributors fitted on **A 53 and M 4 engines.**
   b) « **D** » zone for distributors fitted on **A 79/0 engines.**
   c) « **AZP** » zone for distributors fitted on **A 75/1- M 28/1 and M 28 engines.**

   If the needle is outside the zone corresponding to the distributor type, the weight travel must be adjusted by bending the lugs of stops E and F.

3991



8. Remove the 1692-T device.

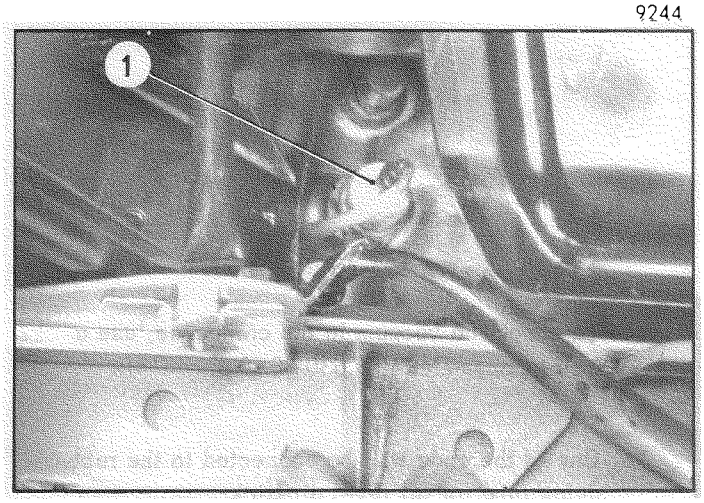
9. Fit the distributor, adjust the contact points and set the ignition point.

10. Fit the fan.

11. Fit the grill.

I. CHECKING THE OIL PRESSURE ON THE CAR.

9244

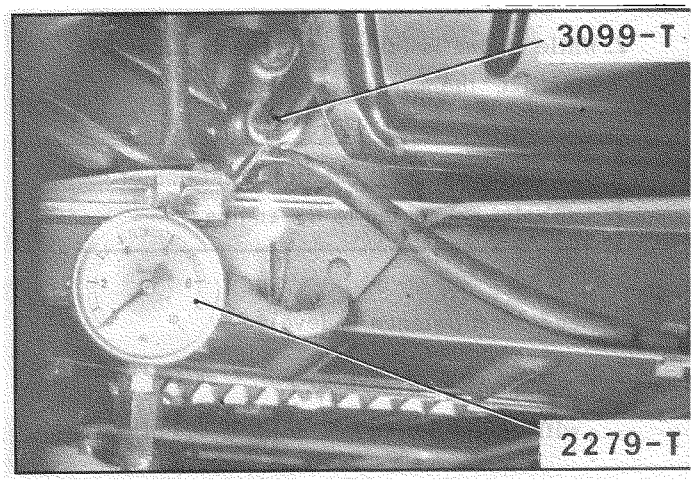


1. Run the engine until the oil temperature reaches 80° C (176° F) approximately.

2. Stop the engine.
Remove (on left hand side of engine) the engine oil pressure switch (1) or the plug if the engine is not equipped with a pressure switch.

3. Fit the 3099-T union (copper joint) equipped with a 2279-T pressure gauge, graduated from 9 to 10 bar (0 to 145 psi).

9243



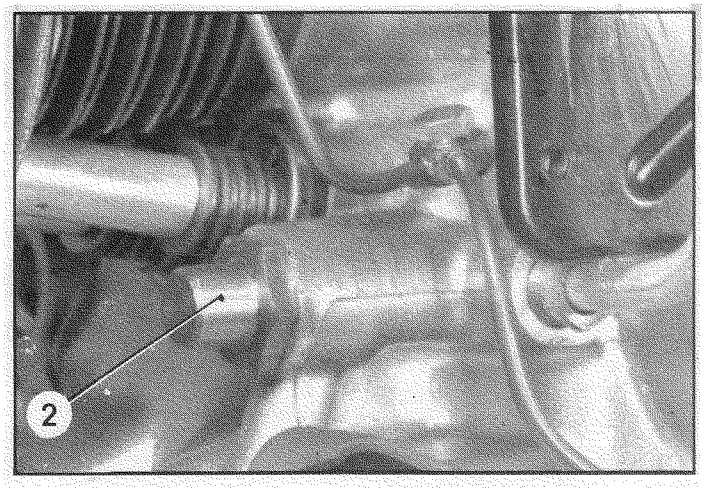
4. **Check the oil pressure :**

a) *Engines A 53 - A 79/0 and M 4 :*
Start the engine bringing the speed up to **4000 rpm.**
The pressure should be : **2.5 to 3.1 bar (34.9 to 38.2 psi).**
If the oil pressure is incorrect, change the number of washers placed under the relief valve spring,(be careful not to drop the ball).

b) *Engine A 79/1 :*
Start the engine bringing the speed up to **6000 rpm.**
The pressure should be : **4 to 5 bar (50 to 72 psi).**
If the oil pressure is incorrect, replace the spring for relief valve piston,located in plug (2).

c) *Engines M 28/1 and M 28 :*
Start the engine, bringing the speed up to **6000 rpm.**
The pressure must be between **5.5 and 6.5 bar (79.7 and 94.2 psi).**
If the pressure is incorrect, replace the spring for relief valve piston, located in plug (2).

4239



If these interventions show no results, the oil pump and lubricating circuit must be checked.

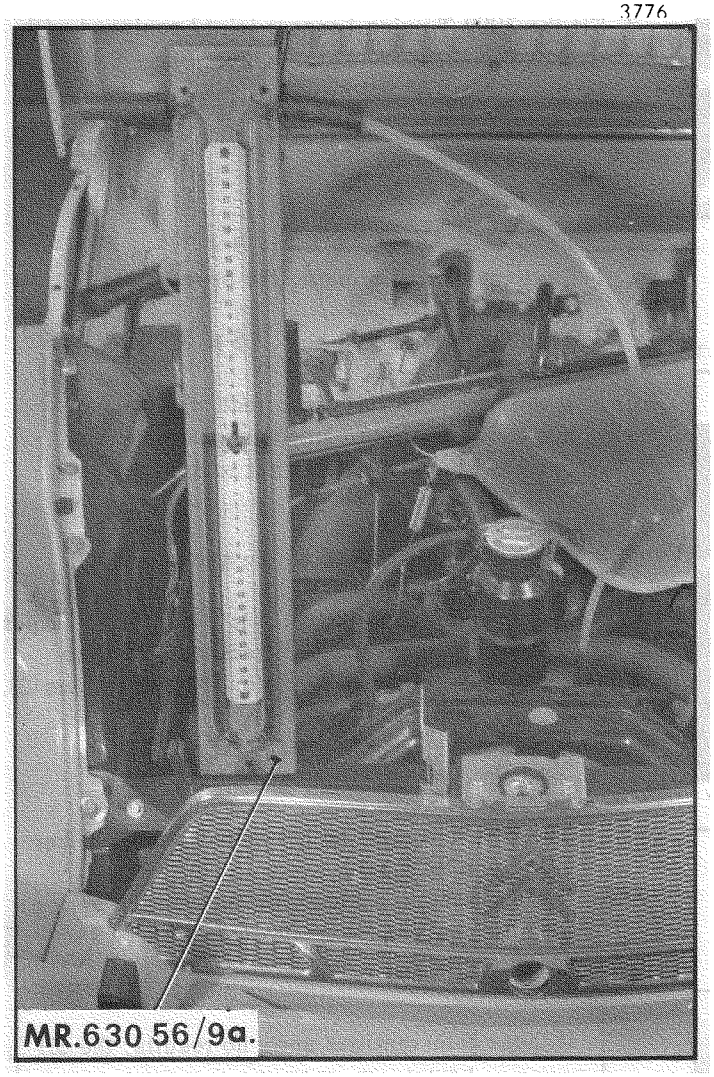
5. Remove the 2279-T pressure gauge, the 3099-T union and the tachometre.

6. Fit the oil pressure switch (1) or the plug (copper joint).
Connect the oil pressure switch lead.

7. Check the oil level and top up if necessary.

II. CHECKING THE VACUUM IN THE CRANKCASE.

3776



1. To check the vacuum in the crankcase, use a water manometer MR. 630-56/ 9 a.

   One of the ends will be connected to the rubber guide tube for oil level dipstick.

2. While engine is idling, accelerate slightly to stabilize the manometer levels.

The liquid should climb in the section of the manomter connected to the engine.

Read the difference in levels :

It should be :

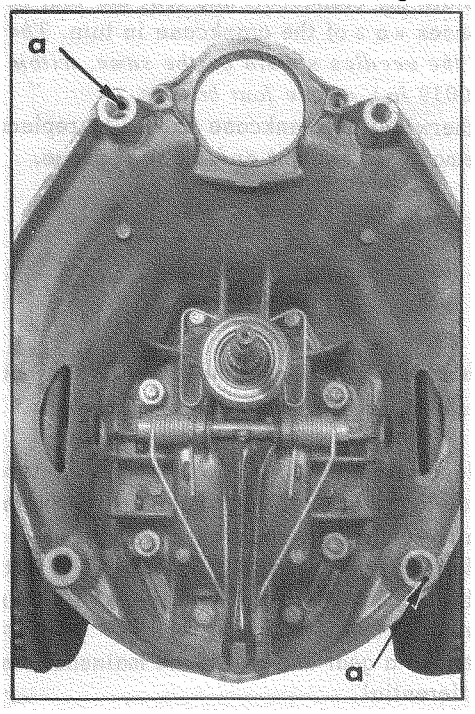
- with engine idling : 5 cm (1.96 in) of water min.

Otherwise, the breather must be replaced.

The vacuum should never fall to zero, no matter the engine speed.

CHECKING THE ALIGNMENT OF THE ENGINE-GEARBOX ASSEMBLY.

3921



REMOVAL.

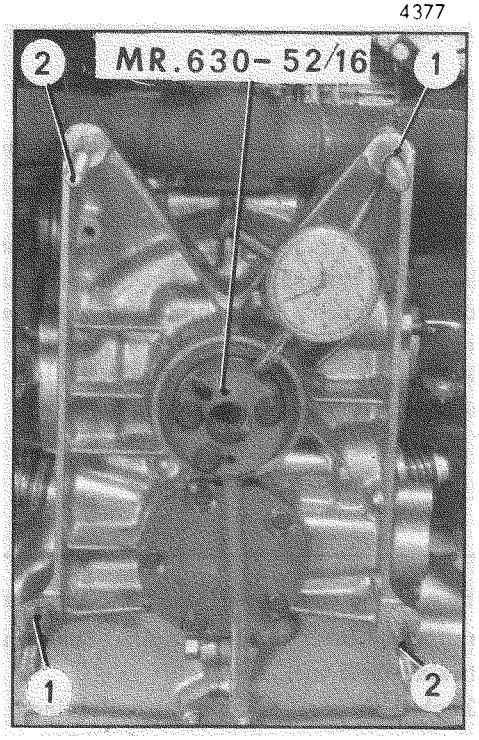
1. **Remove the engine-gearbox assembly.**
2. Remove the expension chamber.
   Place the engine-gearbox assembly on a workshop bench.
3. **Uncouple the engine from the gearbox.**
   Make sure while disengaging the gearbox that no stress is put on the mainshaft.
4. **Prepare the gearbox** *(in the case of a centrifugal clutch)* :
   Remove the clutch drum.
   Unlock and unscrew the lock nut of the bearing (left hand thread).

While slackening the nut, hold the spanner so as not to bear on the mainshaft.

   Disengage the clutch drum-mechanism assembly.
5. **Prepare the engine :**
   Remove the clutch mechanism and disc *(conventional clutch only)*.
   Remove the engine flywheel.
   Remove the sparking plugs.

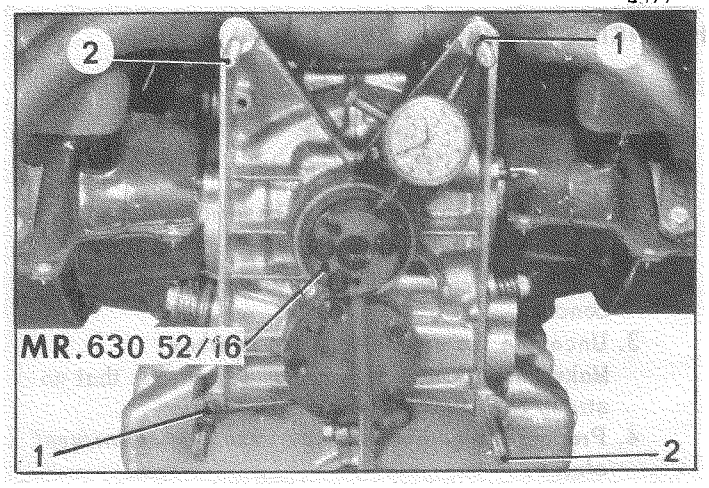
CHECKS.

4377



6. **Checking the housings of the locating dowels :**
   Remove the locating dowels from the crankcase.
   Carefully check the housings « a » of the locating dowels in the crankcase and especially in the clutch housing.
   If the bores are not perfectly cylindrical, the deterioated housing must be replaced.
7. **Checking the position of the studs and locating dowels on the crankcase :**
   Fit the MR. 630-52/16 support,equipped with a dial gauge (2437-T),to the crankshaft.
   NOTE : This is to compare the distances between the centreline of the crankshaft and the locating dowels (1) or the studs (2).
   When the tip of the dial gauge comes into contact with these parts which are cylindrical, the needles turn first in one direction and then in another.
   The reading must be taken at the precise moment the direction changes.
   Fit the locating dowels.
   Rotate the crankshaft and test the two locating dowels (1) in turn. *The position at which the needle changes direction should be the same within 0.10 mm (.0039 in).*
   Rotate the crankshaft and test the two fixing studs (2) in turn. *The position at which the needle changes direction should be the same within 0.10 mm (.0039 in).*
   If the positions at which the needle changes direction are not within tolerance,the crankcase must be renewed.

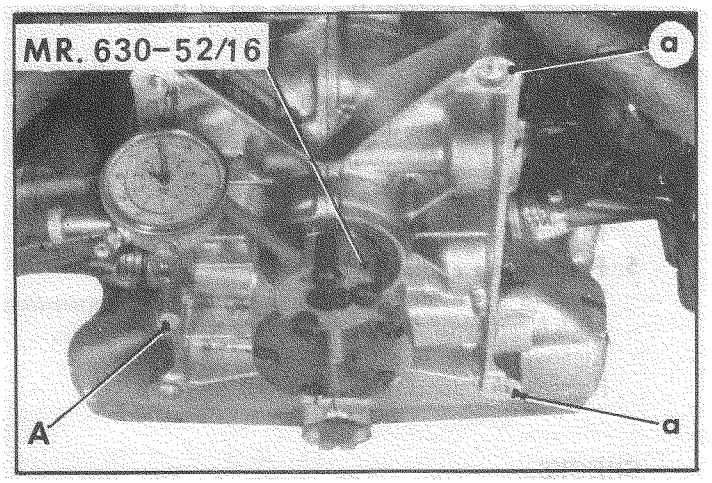
4377



8 Check the bearing surface of the crankcase :

Remove the locating dowels (1) and the studs (2) (note the positions of the studs).
Fit the dial gauge on the support-rod A (see figure).
Rotate the crankshaft and test the four bearing bosses « a » of the crankcase in turn. *The positions of the needles should be the same, within 0.10 mm (.0039 in), on the four bosses.*
Otherwise the crankcase should be replaced.
Remove the support and the dial gauge.

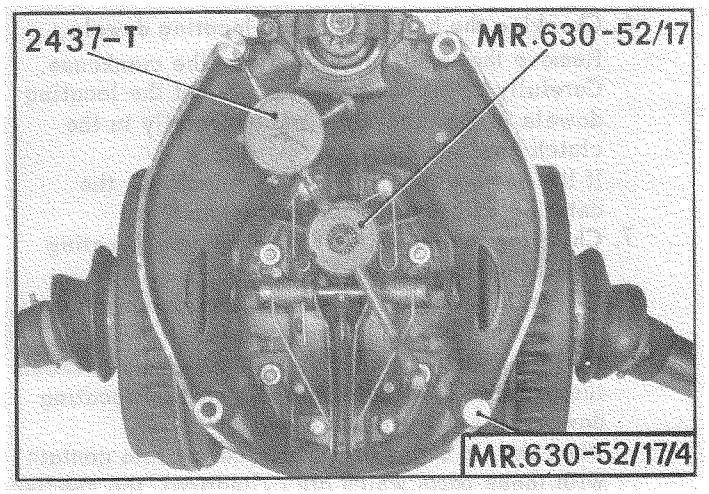
4378



9. Check the position of the bores which house the locating dowels on the clutch housing :

Place the MR. 630-52/17 support (equipped with the dial gauge 2437-T, secured to its shortest rod) on the mainshaft and tighten the securing screw.
Place the two pegs MR. 630-52/17/4 in the bores which house the locating dowels : fix them with two nuts (dia. = 10 mm, 0.39 in - pitch = 150).
Engage a gear and rotate the mainshaft using the differential.
Test the two pegs. The position at which the needle changes direction should be the same within 0.10 mm (.0039 in).

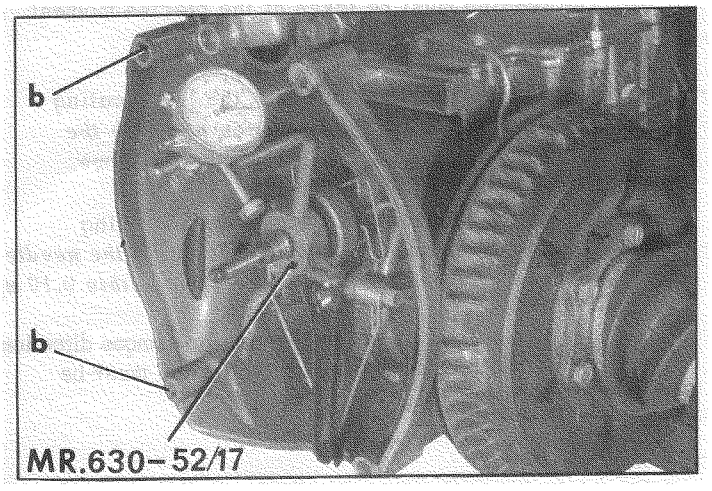
4375



10. Check the bearing surface of the clutch housing :

Remove the pegs.
Fit the dial gauge on the other support rod.
Rotate the mainshaft and test the four clutch housing bosses « b » in turn. *The position of the needles should be the same (within 0.10 mm, .0039 in) on the 4 bosses. Otherwise, the housing must be realigned or replaced.*

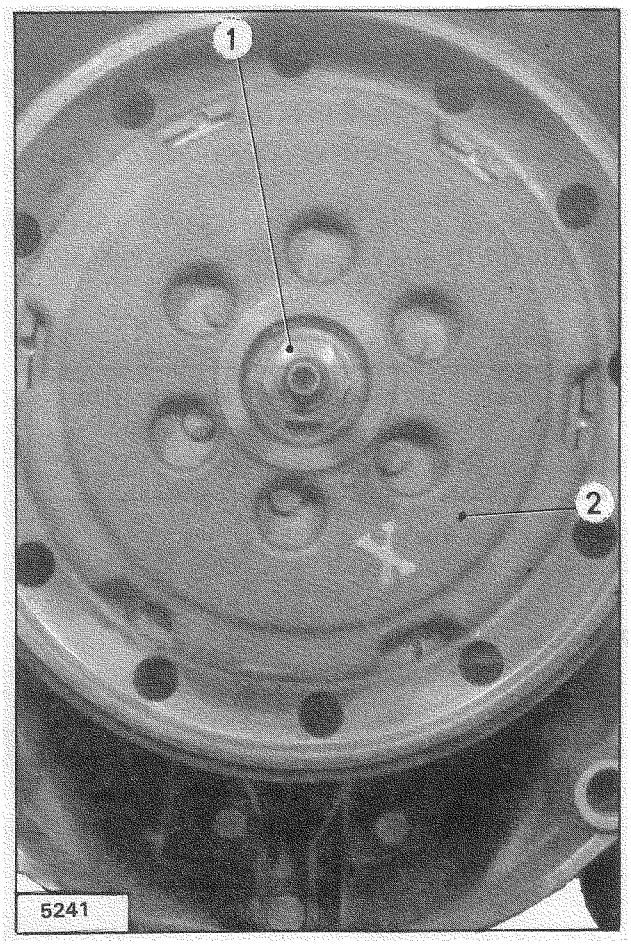
4376

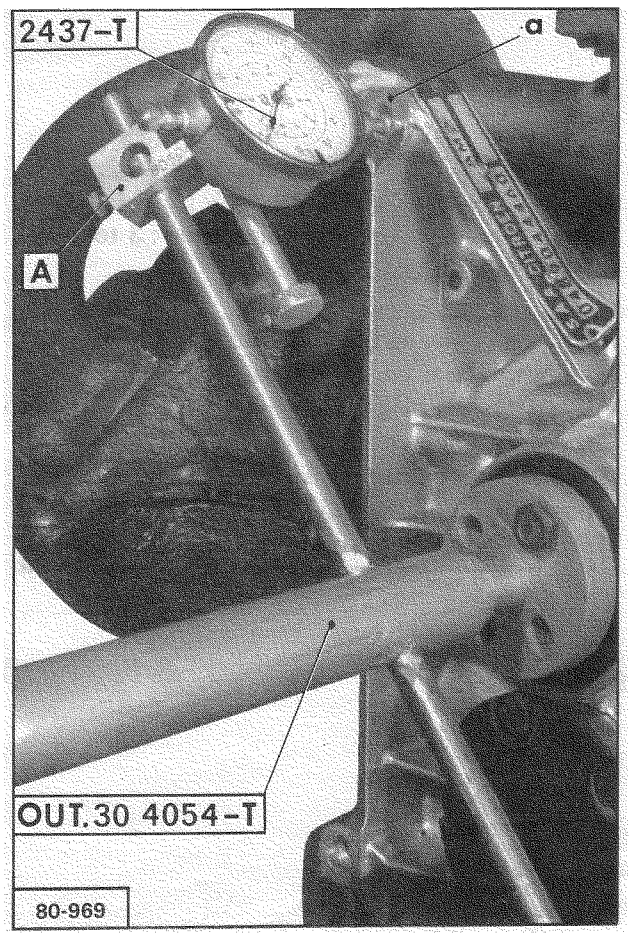


The housing can be realigned and the bosses returned to their correct, original positions, by striking them with a mallet.
Check their positioning after realigning.

Remove dial gauge and support.

CHECKING THE ALIGNMENT OF THE ENGINE-GEARBOX ASSEMBLY





REMOVAL.

1. Remove the engine.

2. Prepare the engine.
Remove :
- the clutch mechanism and disc *(conventional clutch only)*,
- the engine flywheel,
- the sparking plugs.

3. Prepare the gearbox :
(in the case of a centrifugal clutch) :
- Unlock and unscrew the lock nut (1) of the bearing *(left-hand thread).*

While slackening the nut (1), hold the spanner so as not to bear on the mainshaft.

- Disengage the clutch drum-mechanism assembly (2).

(Conventional and centrifugal clutch).
- Remove the clutch thrust bearing.

CHECKS.

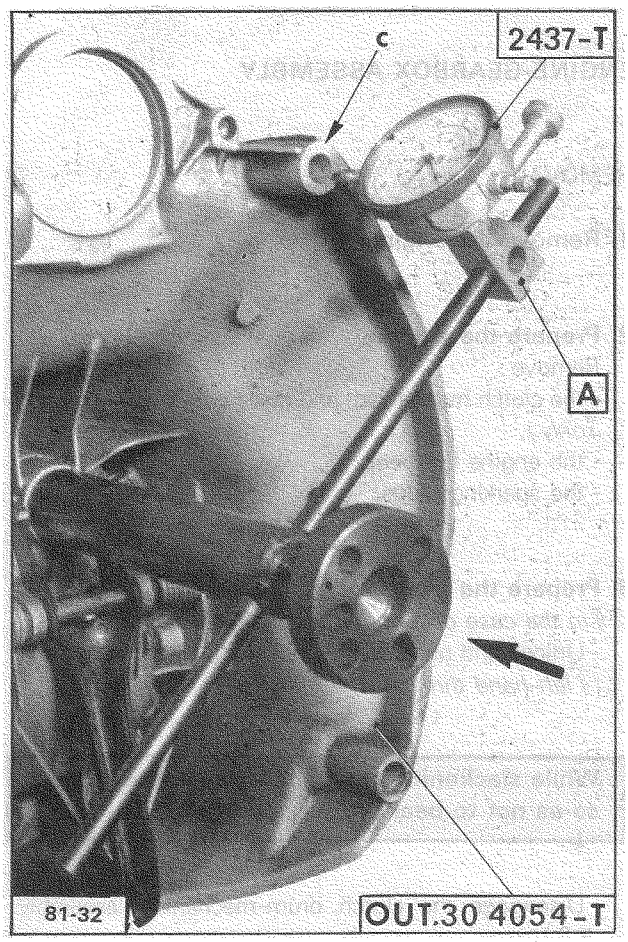
4. Checking the housings of the locating dowels :
Remove the locating dowels from the crankcase.
Carefully check the housings « b » of the locating dowels in the crankcase and especially in the clutch housing.
If the bores are not perfectly cylindrical, the deteriorated housing must be replaced.

5. Check the bearing surface of the crankcase :
Remove the studs *(note their position).*
Fit the 30 4054-T tool equipped with part **A** of support 5602-T or 2041-T and with dial gauge 2437-T, to the crankshaft.
Rotate the crankshaft and test the four bearing bosses « a » of the crankcase in turn :
The position of the needles should be the same, within **0.10 mm,** *on the four bosses.*

The housing can be realigned and the bosses returned to their correct, original positions, by striking them with a mallet.

Remove dial gauge and support.

Supplement No. 1 to Manual 816-1 (ADD)



6. Check the bearing surface of the clutch housing :

Fit the tool on the guide pin for thrust ball bearing.

Rotate the tool by holding it against the guide pin (→) and test the four clutch housing bosses « c » in turn.

The position of the needles should be the same **(within 0.10 mm)** on the four bosses. Otherwise, replace the housing.

The housing can be realigned and the bosses returned to their correct, original positions, by striking them with a mallet.

Remove dial gauge and support.

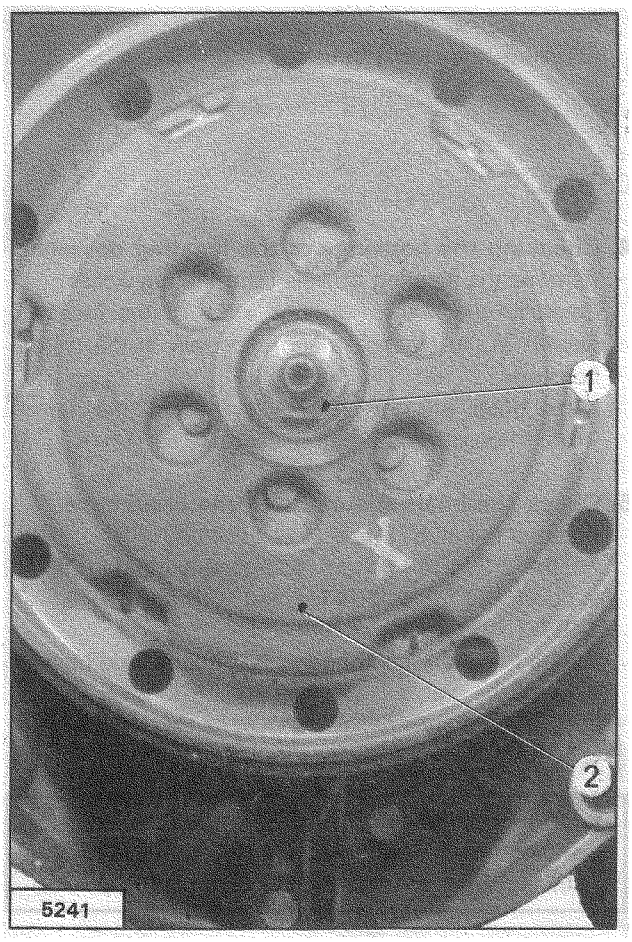
7. Prepare the engine.

Fit :
- engine flywheel : **screw tightening : 4 to 4.5 m.daN.**
- clutch mechanism and disc,
- sparking plugs.

8. Prepare the gearbox.

Fit :
- clutch thrust bearing,

Centrifugal clutch :
- clutch drum-mechanism assembly (2),
- securing nut (1); **tightening torque : 3 to 4 m.daN** *(left-hand thread).*



While slackening the nut, hold the spanner so as not to bear on the mainshaft.
Lock the nut by peening over the metal into the drive-shaft milling.
During this operation, support the nut so as not to damage the drive-shaft threads for oil return.

9. Fit the engine.