

SERVICE MANUAL

**ENGINE**

MODEL B10 SERIES



NISSAN MOTOR CO., LTD.

# ENGINE

## ENGINE

This engine has three main bearings and use the valve lifters and hollow push rods to operate the individually mounted rocker arms which pivot on ball seats. A trocoid gear type oil pump driven by camshaft provides full pressure lubrication for portion of the engine.

The main oil gallery along valve lifter areas passes oil through drilled passages to each cam and main bearings, through the valve lifters and hollow push rods to the rocker arms.

The pistons are the split skirt type of aluminum alloy and carry two compression rings and a oil control ring.

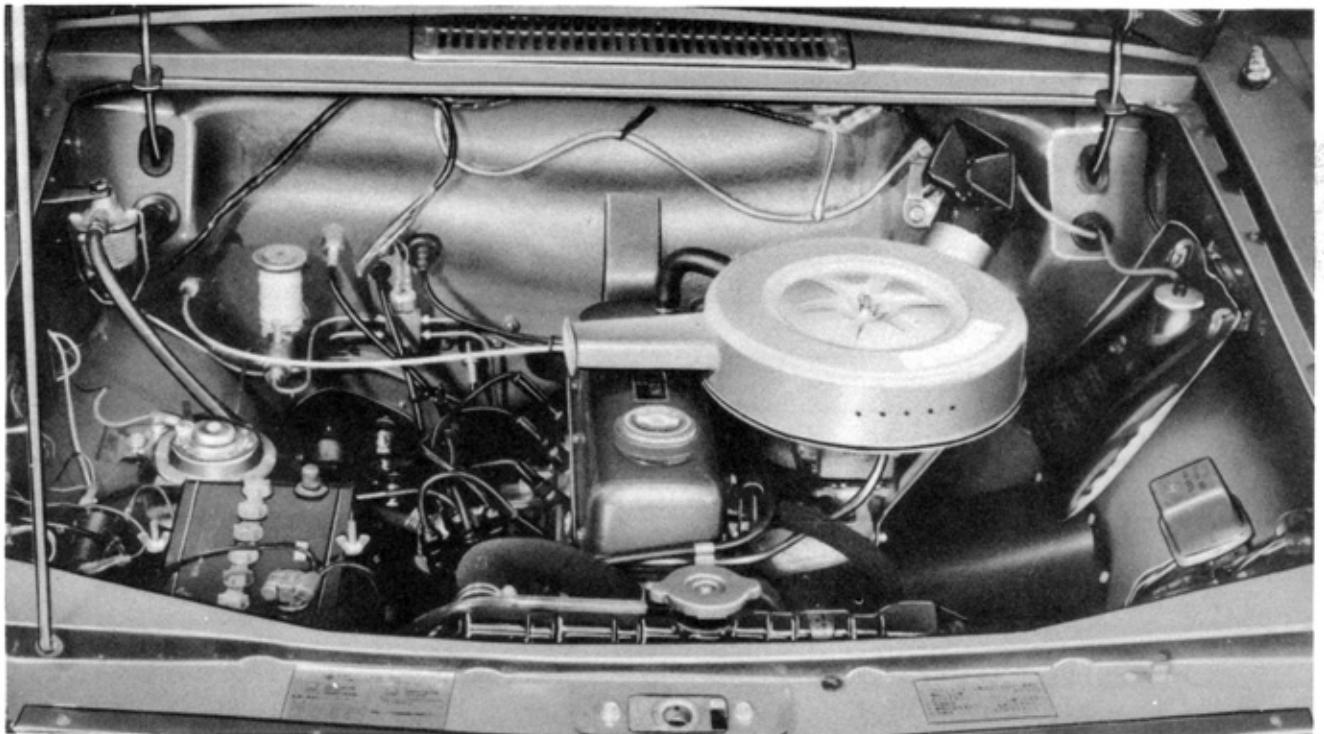
The piston pin is pressed in small end of connecting rods, which have steel backed lead and copper alloy, changeable big end bearings.

The counter balanced crankshaft is fitted. The end thrust on this component is taken by the second main bearing with flange.

The centrifugal water pump and cooling fan are driven by the generator belt.

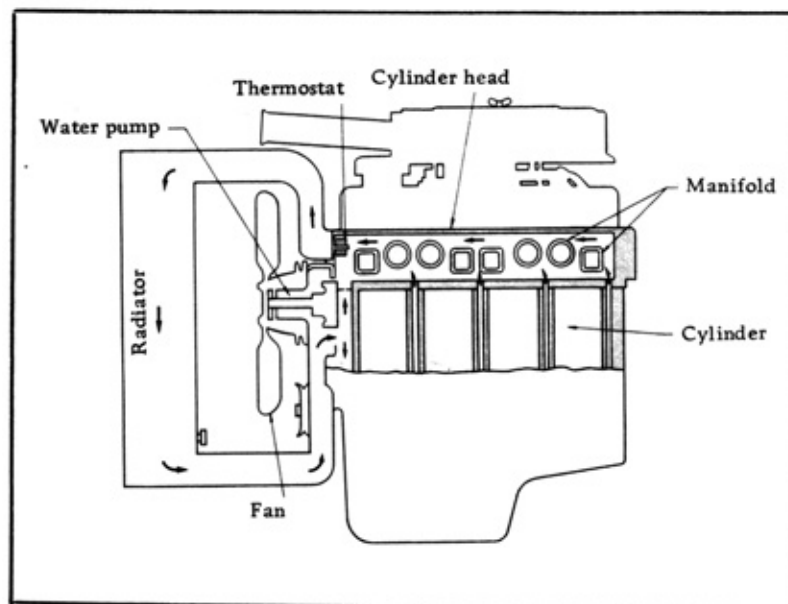
### GENERAL SPECIFICATIONS

Design .....	4 cylinder in line 4 cycle O. H. V.
Bore × stroke .....	73 × 59 mm (2.87 × 2.32 in.)
Displacement .....	988 cc (61 cu. in.)
Compression ratio .....	8.5 : 1
Max. B. H. P. (SAE) .....	62 HP at 6,000 r. p. m.
Max. torque (SAE) .....	61.5 ft.-lb. at 4,000 r. p. m. (8.5 m.-kg at 4,000 r. p. m.)
Ignition timing .....	8° B. T. D. C. at 600 r. p. m.





## COOLING SYSTEM



*Cooling System*

An efficient cooling system is of major importance to ensure the satisfactory running of the engine and it is therefore necessary to pay particular attention to its maintenance.

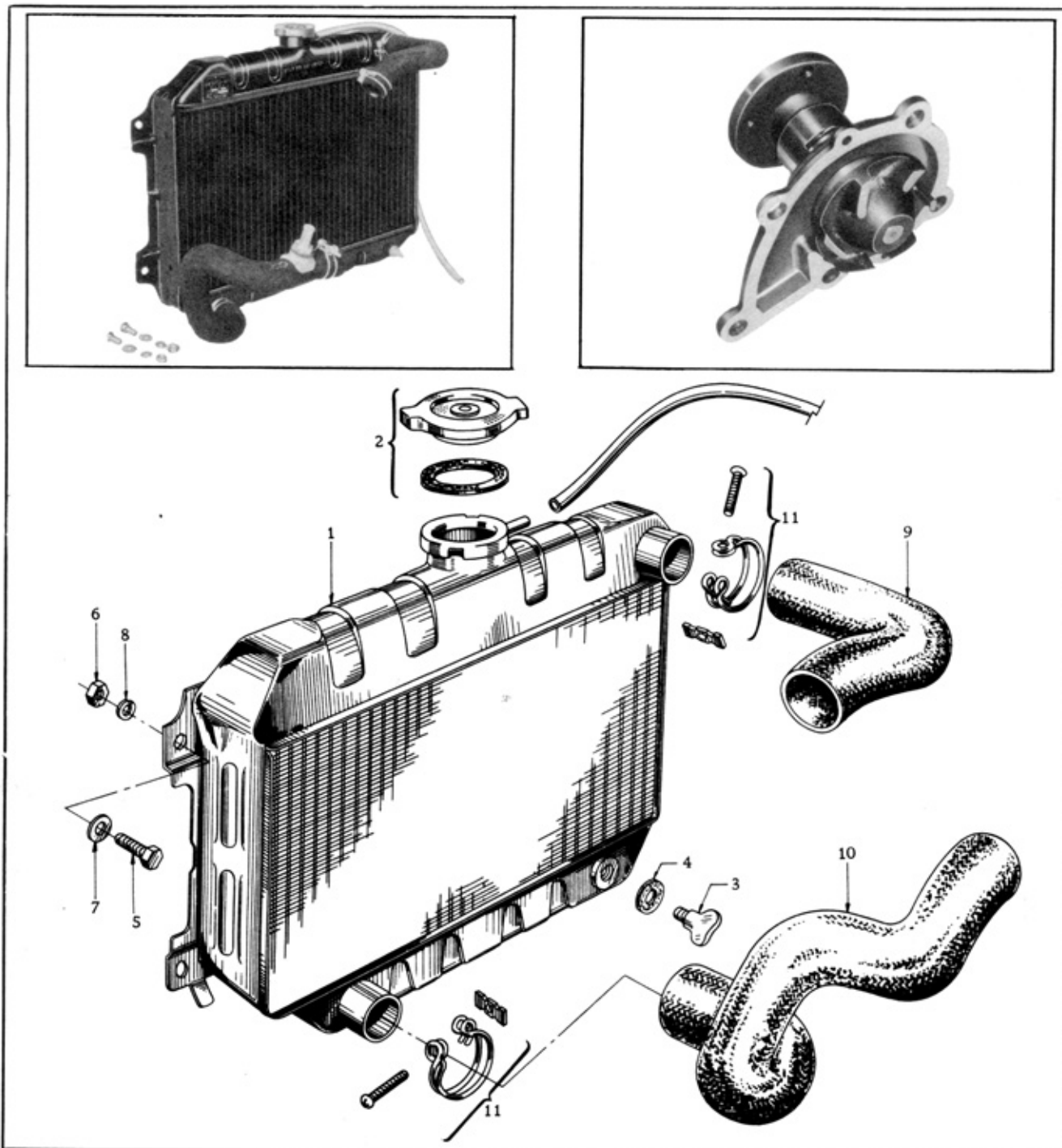
### Description

The cooling system is maintained by water pump circulation, combined with an efficient fan cooled radiator and thermostat.

The system is pressurised and the relief valve, incorporated in the radiator filler cap,

controls the pressure at approximately 0.4 kg per sq. cm. Do not remove the filler cap if the temperature of the coolant is above boiling point or if the engine is running. Topping-up should only be required occasionally to replace water lost through the overflow pipe. Top-up when the engine is cold, and if possible use clean soft water.

Fill to within 1/2 in. of the bottom of the filler plug well. Overfilling when the engine is cold may cause water to flow through the overflow pipe. The capacity of the system is approximately 4.5 liters.



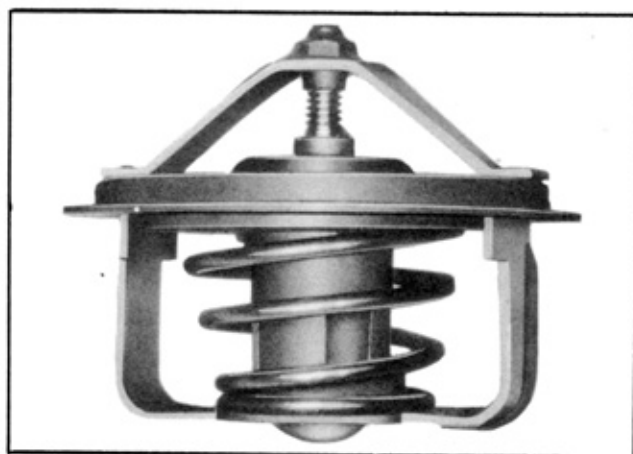
Radiator

1	Ass'y-radiator (for cooler)	5	Bolt	9	Hose-cylinder head to radiator
2	Ass'y-cap, pressure valve	6	Nut	10	Hose-radiator to water pump
3	Handle-drain cock	7	Washer-plain	11	Clamp-hose
4	Packing-drain cock	8	Washer-lock		

## Thermostat

In order to ensure maximum efficiency, it is essential to keep the engine operating temperatures within certain limit. To assist this a pellet type thermostat is fitted, being located in the water outlet at front of the cylinder head.

Pellet type thermostat works by the principle of rapid variation of solution of wax.



*Pellet Type Thermostat*

The device consists of metallic pellet, filled with the wax, which controls a mash-room valve by solution of wax.

When the engine is cold this valve is closed and on starting the engine the flow of water to the radiator is temporarily restricted.

Due this, the temperature of the water in the cylinder head and cylinder jackets will quickly rise, thus ensuring rapid warming up.

The heat so generated will gradually press up the piston by shrinkage of synthetic rubber sleeve so opening the valve, and ultimately permitting a full flow of water to the radiator. The thermostat itself is detachable; therefore, should be occasion arise, it can be removed

from its housing and the hose reconnected to avoid laying up the car.

The thermostat opening is set by the manufacturer and can not be altered.

During decarbonising it is policy to test this opening by immersing the thermostat in water raised to requisite temperature. The valve should open under these conditions, but if it fails to open a new unit should be fitted.

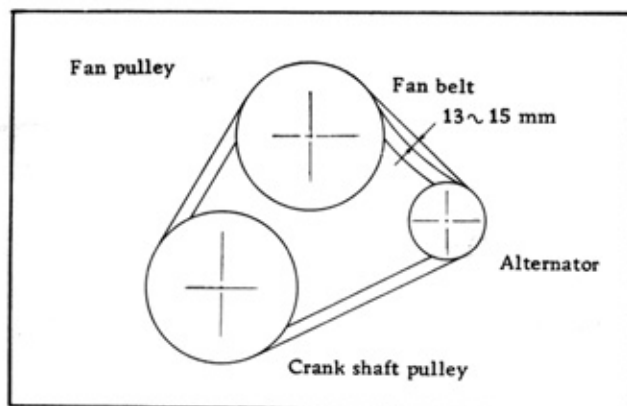
## Overheating

Overheating may be caused by a slack fan belt, excessive carbon deposit in the cylinders, running with the ignition too far retarded, incorrect carburetor adjustment, failure of the water to circulate or loss of water.

## Fan Belt Adjustment

The fan is driven from the crankshaft by a "V" belt, this also driving the alternator.

A new belt can be fitted by first loosening the clamp bolts, which hold the dynamo in position, and moving the dynamo towards the engine. Slide the belt over the fan and onto the fan pulley.



*Fan Belt Adjustment*

	Part No.	Rated Temperature
Standard	21200 61001	Open at $76.5^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$ Open fully at $90^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$
Optional for cold district	21200 61001	Open at $82^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$ Open fully at $95^{\circ}\text{C} \pm 1.5^{\circ}\text{C}$

## DATSUN 1000

Adjustment is then made by bringing the alternator away from the engine. The belt should be sufficiently tight to prevent slip, yet the belt should have 10 to 15 mm slack between the generator and crankshaft pulley when the midspan is pushed firmly.

After the correct tension has been obtained, securely lock it in position again.

### Frost Precautions

Freezing may occur first at the bottom of the radiator or in the lower hose connections.

Ice in the hose will stop water circulation and may cause boiling. A muff can be used to advantage, but care must be taken not to run with the muff fully closed, or boiling will result. When frost is expected or when the car is to be used in a very low temperature, make sure that the strength of the solution is, in fact, up to the strength advised by the manufacturers. The strength of the solution must be maintained by topping-up with anti-freeze solution as necessary. Excessive topping-up with water reduces the degree of protection afforded. Solution must be made up in accordance with instructions supplied with the container.

Top-up when the system is cold.

If the cooling system has to be drained, run the mixture into a clear container and use again.

### Protection by Draining

On cars where anti-freeze is not used the following precautions must be taken during frosty weather to obviate any damage due to freezing of the cooling system.

When heavy frost is imminent, the cooling system must be completely drained. It is not sufficient merely to cover the radiator and engine with rugs and masks. There are two drain cocks one on the left-hand side of the cylinder block and the other at the base of the radiator block. Both taps must be opened to drain the system and the car must be on level ground while draining.

The drain taps should be tested at frequent intervals by inserting a piece of wire to ensure that they are clear. This should be done immediately the taps are opened, so that any obstruction freed by the wire may be flushed out by the water. The draining should be carried out when the engine is hot.

When completely drained the engine should be run for a timed minute to ensure that all water has been cleaned from the system.

A suitable notice should be then affixed to the radiator, indicating that the water has been drained.

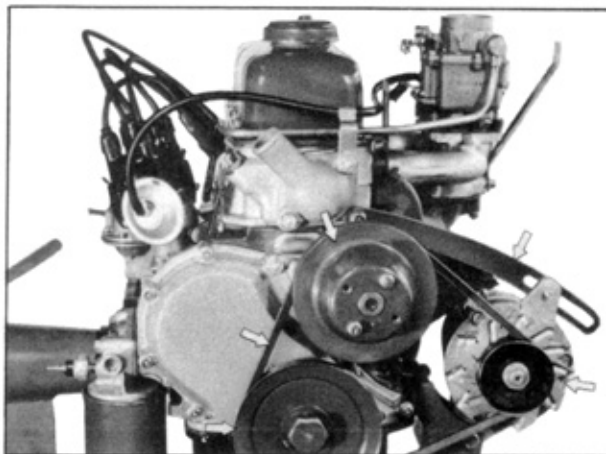
### Flushing the Radiator

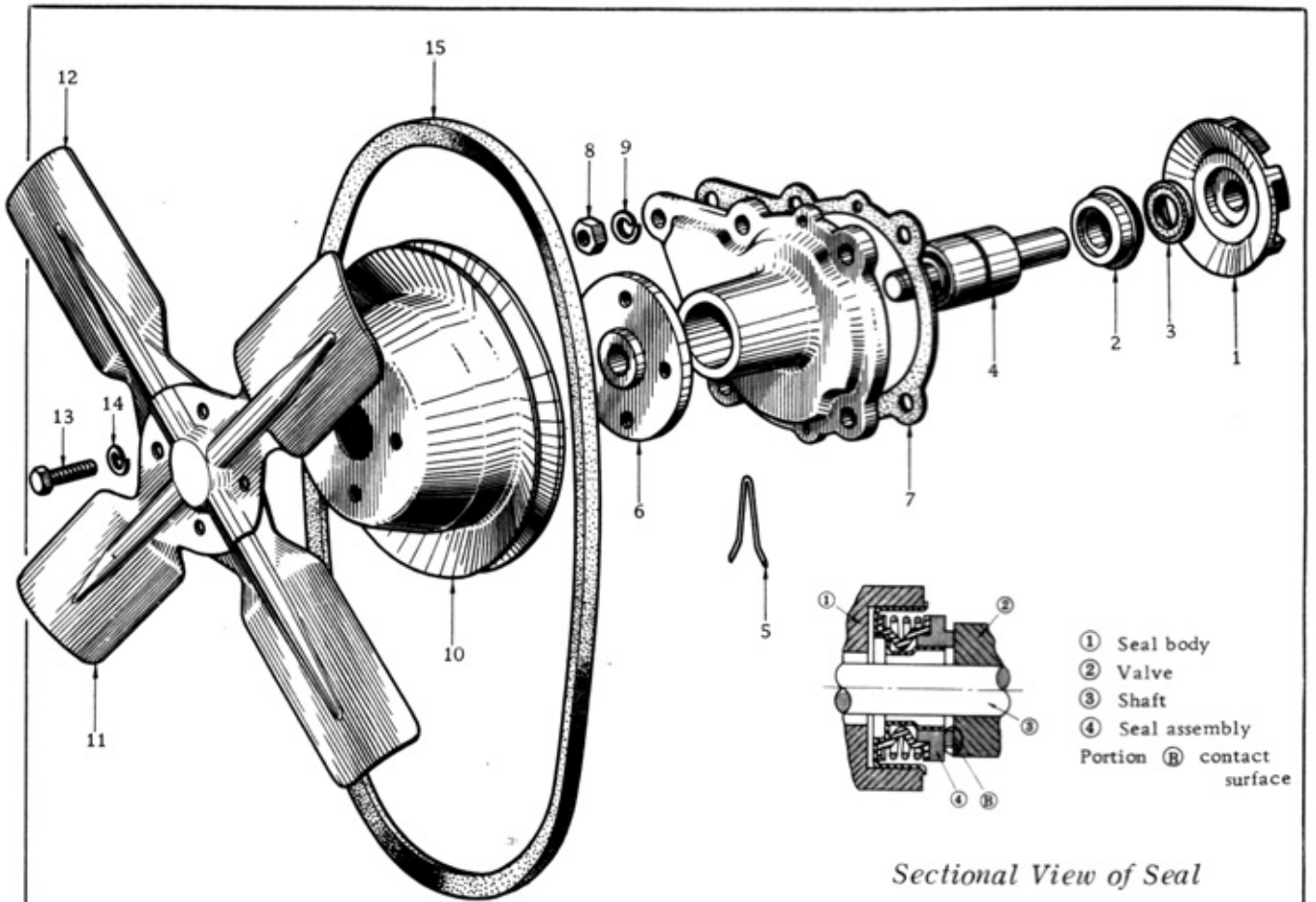
To ensure efficient circulation of the coolant and to reduce the formation of scale and sediment in the radiator, the system should be periodically flushed with clear running water, preferably before putting in anti-freeze in the winter and again when taking it out in the spring. The water should be allowed to run through until it comes out clear from the drain taps. At intervals a stiff piece of wire should be inserted into the taps during draining to ensure that they are not becoming clogged with sediment.

This method of radiator flushing may serve well, but in cases where the "furring" up is excessive the operator will find it more efficient practice to remove the radiator completely and flush in the reverse way to the flow, turn the radiator upside down and let the water flow in through the bottom hose connection and out of the top connection.

### Water Pump

After draining the water from the radiator, remove the pump unit from the cylinder block by taking off the fan belt and releasing the set-bolts with spring washers and hinge bolts to the alternator.





*Sectional View of Seal*



*Components of Water Pump*

1	Vane-water pump	9	Washer-lock
2	Ass'y-seal, water pump	10	Pulley-fan & water pump
3	Ass'y-seat	11	Blade-fan front
4	Bearing-water pump	12	Blade-fan rear
5	Wire-lock, bearing	13	Bolt
6	Hub-pulley	14	Washer-lock
7	Gasket-water pump cover	15	Belt-fan
8	Nut		



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## Removing the Pump Shaft Assembly

Disconnect the fan blades, pulley and cover.

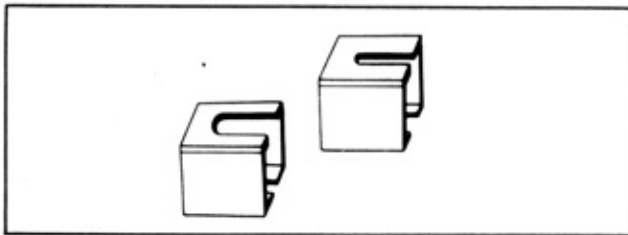
The shaft and ball bearings are combined with one unit.

Put the pulley hub on the bench.

First, press or knock the shaft end with a drift (hard bar) and draw out the pulley hub on the U type bench.

Take out the set pin from the slit which locked the shaft assembly to the pump body.

Next, turn the body upside down and press out the shaft assembly from the vane side on the U type bench.

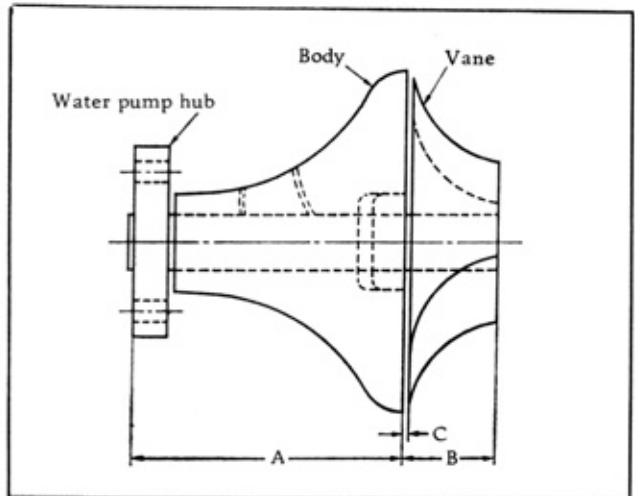


Example of the Bench for Pump Body

## Adjusting Clearance the Vane End and Body

First, press down the shaft fitting with a groove line to insert the set pin.

Inserting thickness gauge (Thickness 0.4-0.5 mm) between the vane end on the U block bench. Take out the thickness gauge and find out good condition.



Adjustment of Water Pump

- A ..... 74.0 mm
- B ..... 19.5 mm
- C ..... 0.5 mm

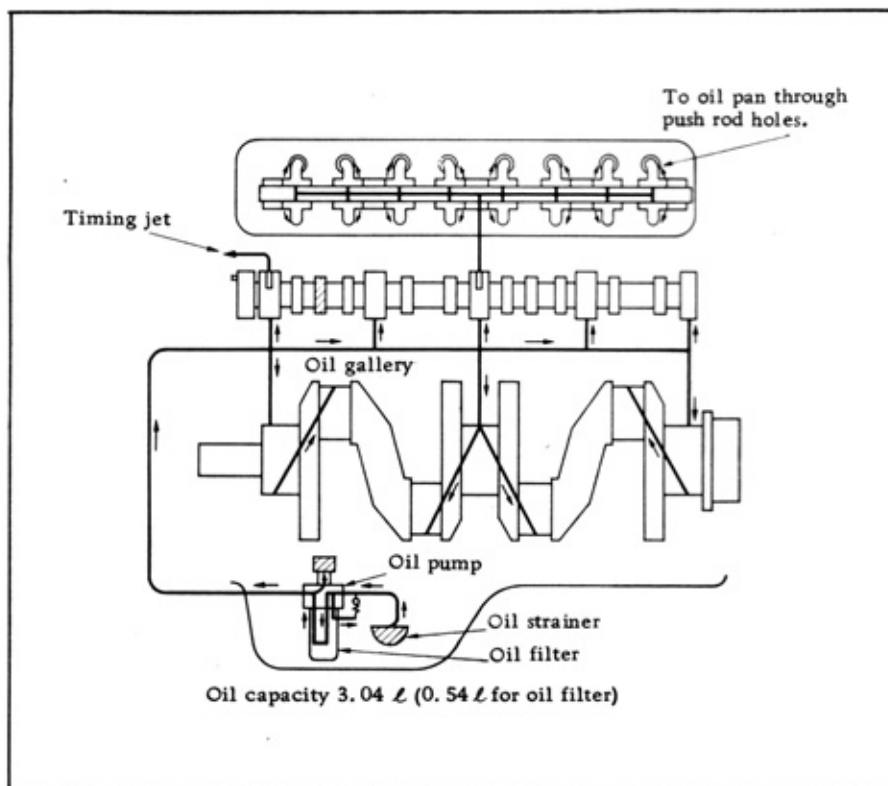
The shaft and ball bearing assembly can be drew out from the body.

Thus take out the vane, floating seal and seal which remained the pump body.

The reassembling of the pump is a reversal of the disassembly procedure, but a care should be taken to ensure that the shaft assembly is fitted correctly for a slit (a hole of set ring) with a groove of shaft so as to insert and set the said ring correctly.

Hub	21054	18000
Bearing shaft	21035	13201
Seal ass'y	21026	73000
Seat ass'y	21027	73000

## LUBRICATION

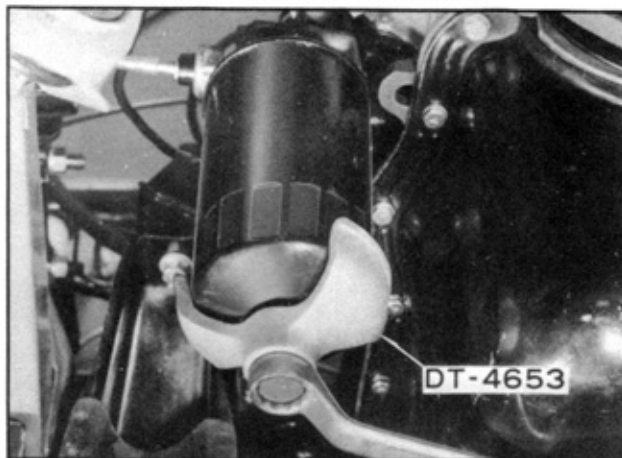


Oil Passages

## Circulation of Oil

Pressure lubrication is used throughout the unit and is provided by an eccentric non-draining oil pump. The oil pump is bolted into the right-hand side of the cylinder block, and is driven from the camshaft gear by the drive gear.

The oil is drawn into the pump via the filter and is delivered through oil regulator which is situated at the lower body of oil pump.



From the relief valve the oil passes into the main oil gallery on the right-hand side of the engine. The flow then passes via connecting oilways to the main, big end and camshaft bearings through drillings in the crankshaft. The connecting ends are drillings in the cylinder block and the rear rocker shaft bracket, to lubricate the rockers, and then drains back into the oil pan via the push rod apertures. The oil from the center camshaft bearing enters a gallery on the left-hand side of the engine and lubricates the tappets through individual drillings. As the camshaft rotates, two grooves in the front journal register with a small hole in the camshaft thrust plate thus allowing a small amount of oil to pass into the timing case twice during case revolution of the camshaft to provide lubrication for the timing chain and gears.

From the timing case the oil returns via a drain hole back to the oil pan. The filter therefore forms part of the main oil gallery and as such is filled with oil under pressure.

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The full of the oil enters the element through holes in the cartridge, and passes through the element into the annular space round the center pipe.

This space is sealed top and bottom so that the oil can only escape through a small hole into the hollow center pipe and from this point back into the oil pan.

## Draining the Oil

The oil on new and reconditioned engines must be drained and then filled with new oil after first 2,000 miles (3,000 km) and at intervals of every 3,000 miles (5,000 km). The drain plug is at the oil pan. The oil should be drained when the engine is hot as the oil will flow more readily.

Before filling the oil pan with new oil disconnect and change the oil cartridge.

## Oil Pressure

The oil pressure should not drop below 30 lb./sq.in. (2.1 kg/cm<sup>2</sup>) on the gauge at normal road speeds, whilst approximately 10 lb./sq.in. (0.7 kg/cm<sup>2</sup>) should be shown when the engine is idling. New engines with new oil will give considerably higher readings at low speeds should there be a noticeable drop in pressure, the following points should be checked:

- a) That there is a good supply of the correct grade of oil in the oil pan.
- b) That the strainer in the oil pan is clean and not choked with sludge.
- c) That the bearings, to which oil is fed under pressure, have the correct working clearances excessive the oil will escape more readily from the sides of the bearings, particularly when the oil is warm and becomes more fluid.

This will cause a drop in pressure on the gauge as compared with that shown when the bearings are in good order. The relief valve in the lubrication system deals with any excessive oil pressure when starting from cold. When hot the pressure drops as the oil becomes more fluid.

## Check for Low Oil Pressure

Check the level of oil in the engine sump by means of the dip-stick and top up if necessary. If the warning light is still on after refilling the sump, switch off and ascertain that the gauge strainer in the sump is clean and not choked with sludge, also that no air leakage exists at the strainer union on the suction side of the oil pump being defective, remove the unit and rectify the fault.

## Removing the Filter

A new filter cartridge should be changed after first 2,000 miles (3,000 km) and then every 10,000 km after this.

The filter forms part of the main oil gallery of the engine. The element of oil filter is sealed in the container as a unit, it can easily be removed by hand. Take care not to lose the rubber sealing ring.

The filtered oil in the element of filter cartridge is sent to the oil passage in the cylinder block, delivered to all the lubrication system, crankshaft journal, crank pin, cylinder bore, locker arm, camshaft journal and chain tensioner, and finally returned to the oil pan.

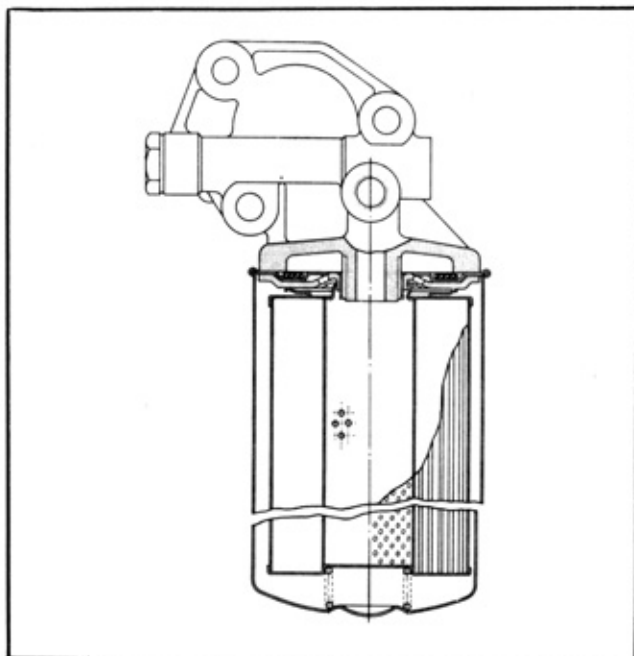
The oil filter is provided with a relief valve. If the temperature of lubricant oil is low at starting, oil viscosity is high, or if the filtration resistance of the oil filter element is large caused by its choke up, the relief valve will be opened with pressure difference to bypass oil.

## Removing the Oil Pan

The sump capacity is 3.1 liters. Drain the oil and replace the drain plug.

Remove the set screw bolts which are inserted from the underside of the securing flange, and the lower bolts from the bottom edge of the bell housing. Lower the oil pan from the engine, taking care not to damage the joint washers in the process.

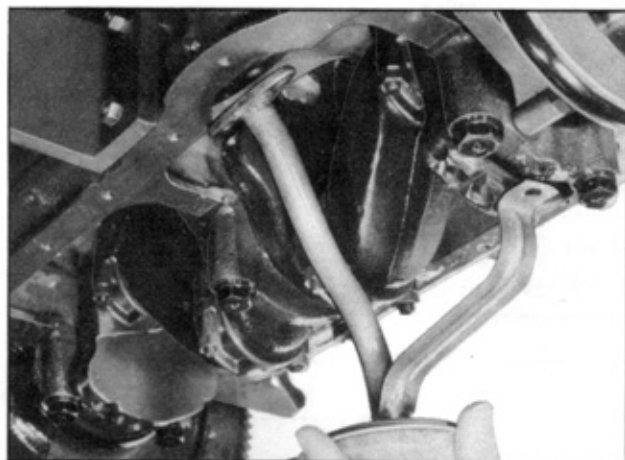
## Removing the Strainer



With the sump lowered it is possible to remove the oil strainer through which oil is drawn into the oil pump. To remove the strainer undo the union connecting the oil pick-up to the pump and unscrew the securing bolts.

The strainer may be dismantled for cleaning purpose by removing the delivery pipe flange bolts.

Notice that there are the dowel pins to the cover which must be positioned correctly when refitting.



*Oil Filter*

## Removing the Oil Pump

Remove the oil pan and pick-up strainer. Three of the five bolts securing the oil pump bottom cover are long enough to secure the pump to the crankcase. Unscrew the long bolts and remove the pump with its drive shaft.

## Dismantling the Oil Pump

Remove the setscrews and spring washers which secure the cover to the body and take off the cover. On tilting the body upside down the inner rotor with its drive shaft, and the outer rotor will slide out.

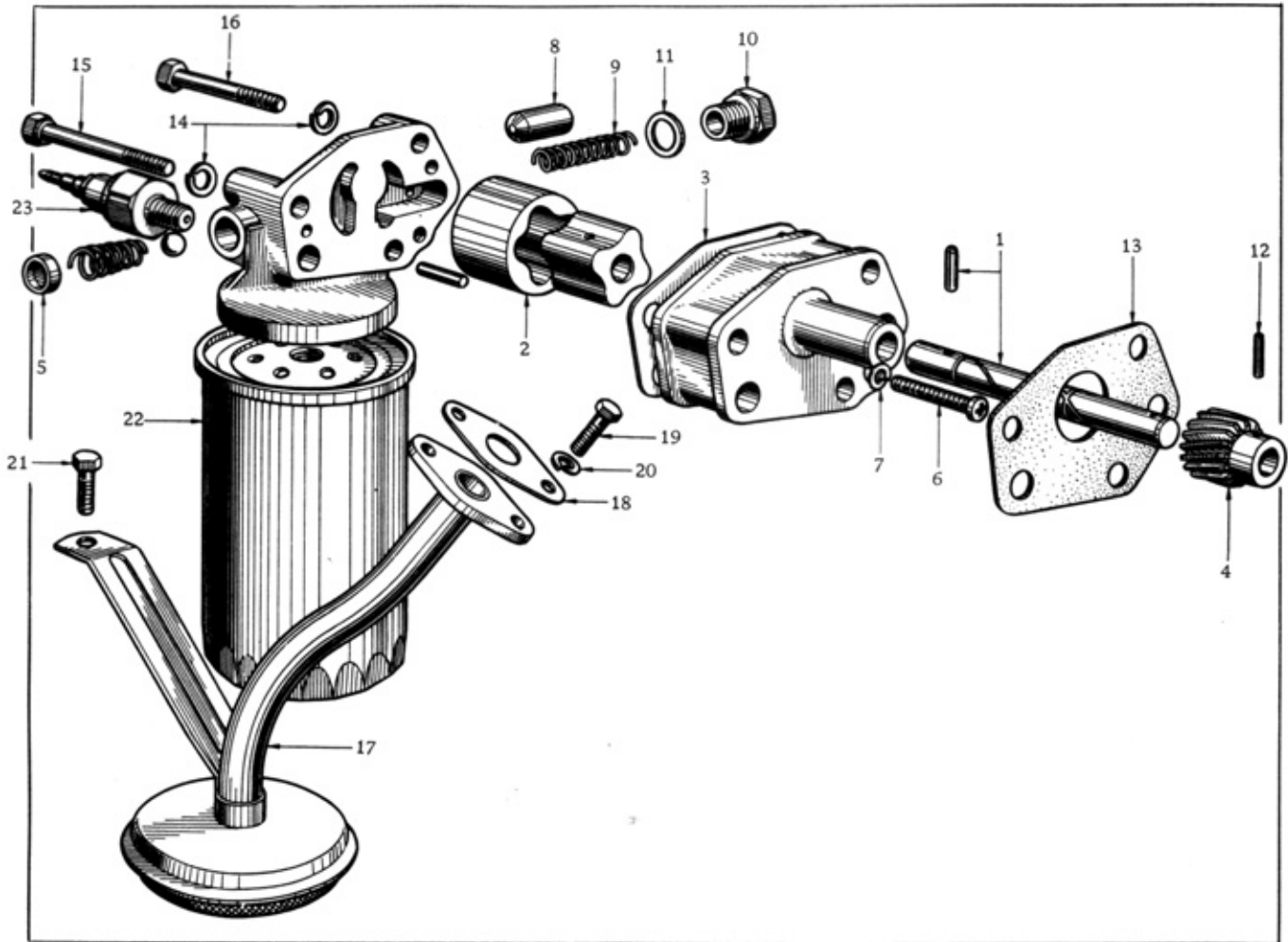
## Refitting the Pump

Clean out the sump by washing it in paraffin, the care to remove any traces of the paraffin before refitting the oil pan to the engine. Pay particular attention to the oil pan and crankcase joint faces, and remove any traces of oil jointing material. Examine the joint washer and renew it if necessary. The oil joint washer can be used again if it is sound, but it is advisable to fit a new one. Smear the faces of the joint with grease and fit the joint washer. Lift the oil pan into position and insert the setscrews into the flange tightening them up evenly.

## Reassembling the Oil Pump

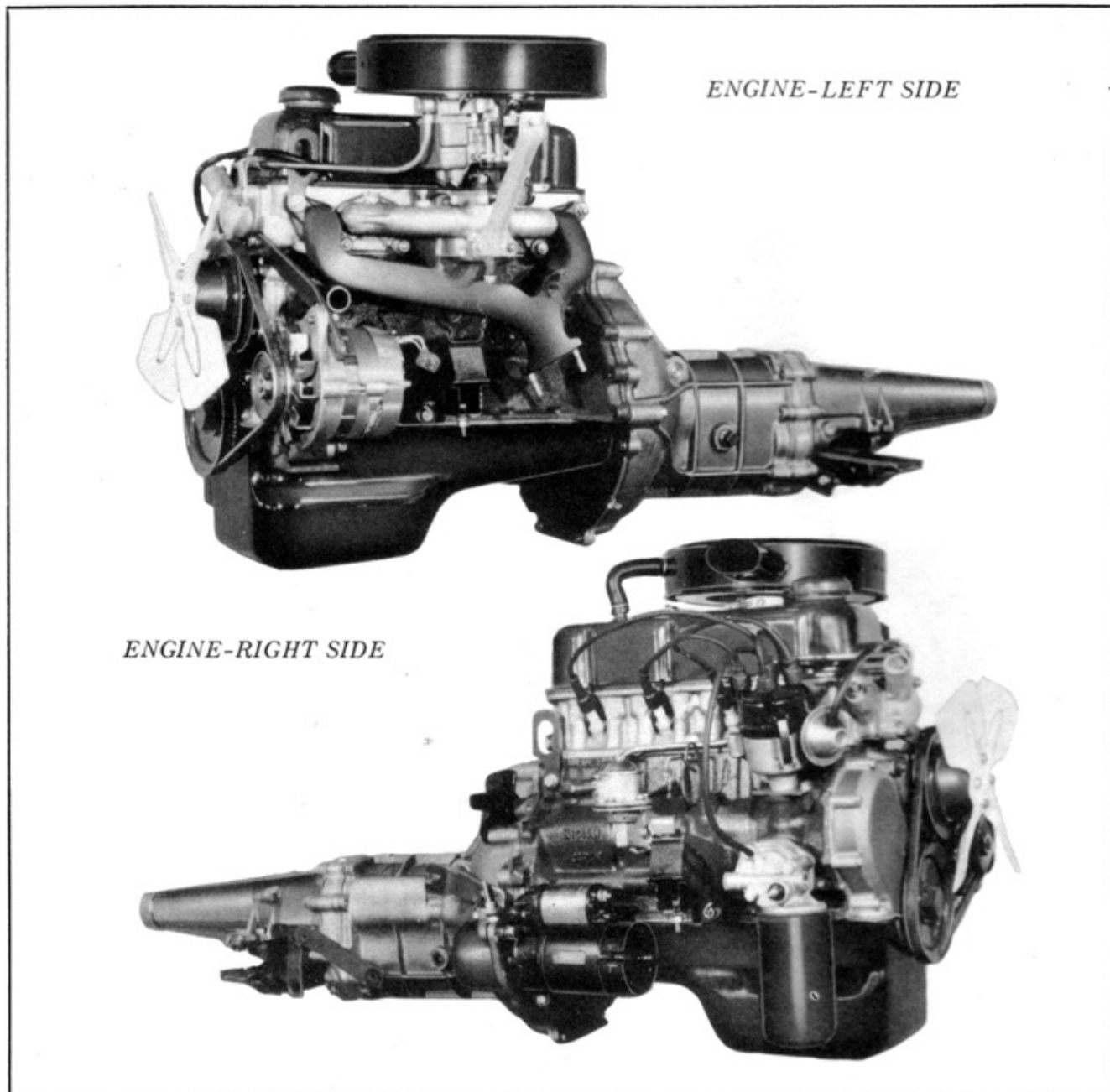
The outer rotor has a chamfered edge. It is of great important that this chamfer be towards the base of the body. Failure to assemble in this way will result in the cover is tightened down.

Insert the slotted end of the drive shaft into the body and bring the rotors into mesh.



*Oil Pump, Oil Filter & Oil Strainer*

1	Ass'y-shaft, drive oil pump	13	Gasket-oil pump to cylinder block
2	Gear-drive	14	Washer-lock
3	Gasket-oil pump cover	15	Bolt
4	Gear-drive	16	Bolt
5	Plug-welch	17	Ass'y-strainer, oil
6	Bolt	18	Gasket-oil strainer
7	Washer-lock	19	Bolt
8	Valve-oil regulator	20	Washer-lock
9	Spring-oil regulator	21	Bolt
10	Plug-oil regulator	22	Ass'y-oil filter, cartridge
11	Washer-oil regulator	23	Ass'y-switch, oil pressure
12	Pin-slotted		

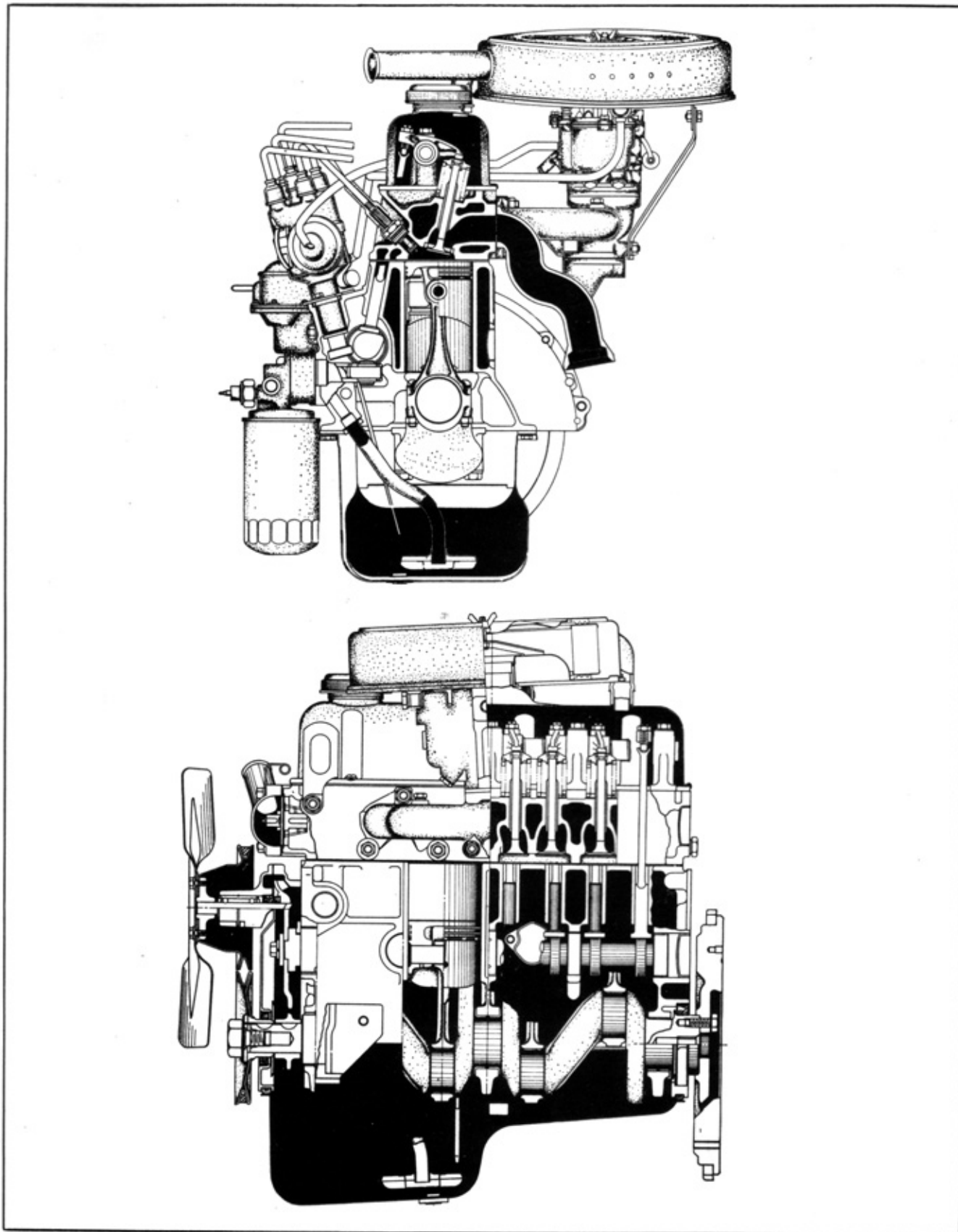


*ENGINE-LEFT SIDE*

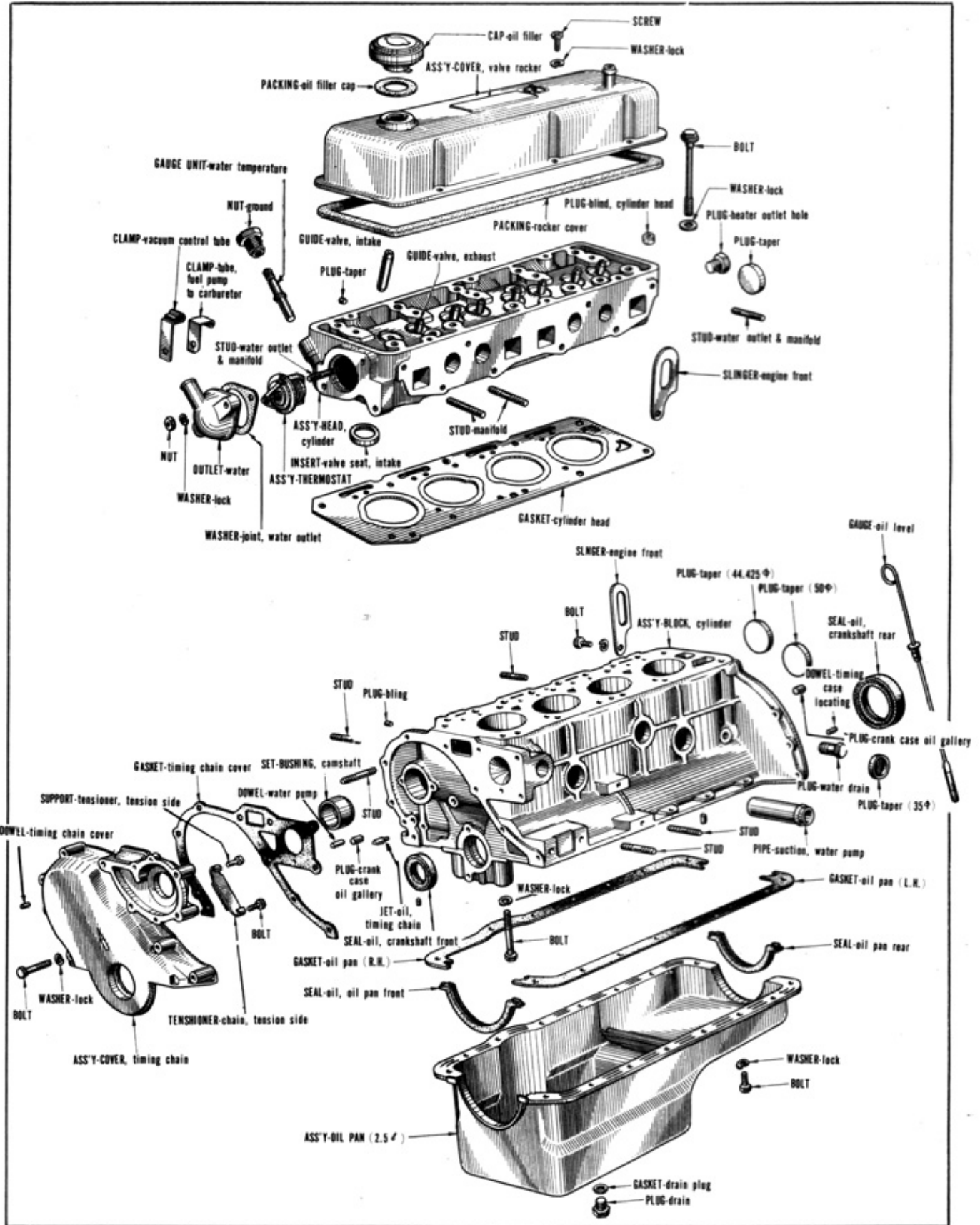
*ENGINE-RIGHT SIDE*

Tightening torque	(m-kg)
Cylinder head bolts	4.5 - 4.8
Main bearing cap bolts	5.0 - 5.3
Connecting rod bolts/nuts	3.4 - 3.6
Flywheel bolts	2.5 - 3.0
Cam shaft sprocket	4.0 - 4.5
Rocker shaft bolts	2.0 - 2.3
Water pump nuts	1.2 - 1.3
Oil pump bolts	1.3 - 1.5
Oil pan bolts	0.5 - 0.6
Front cover bolts	0.5 - 0.6

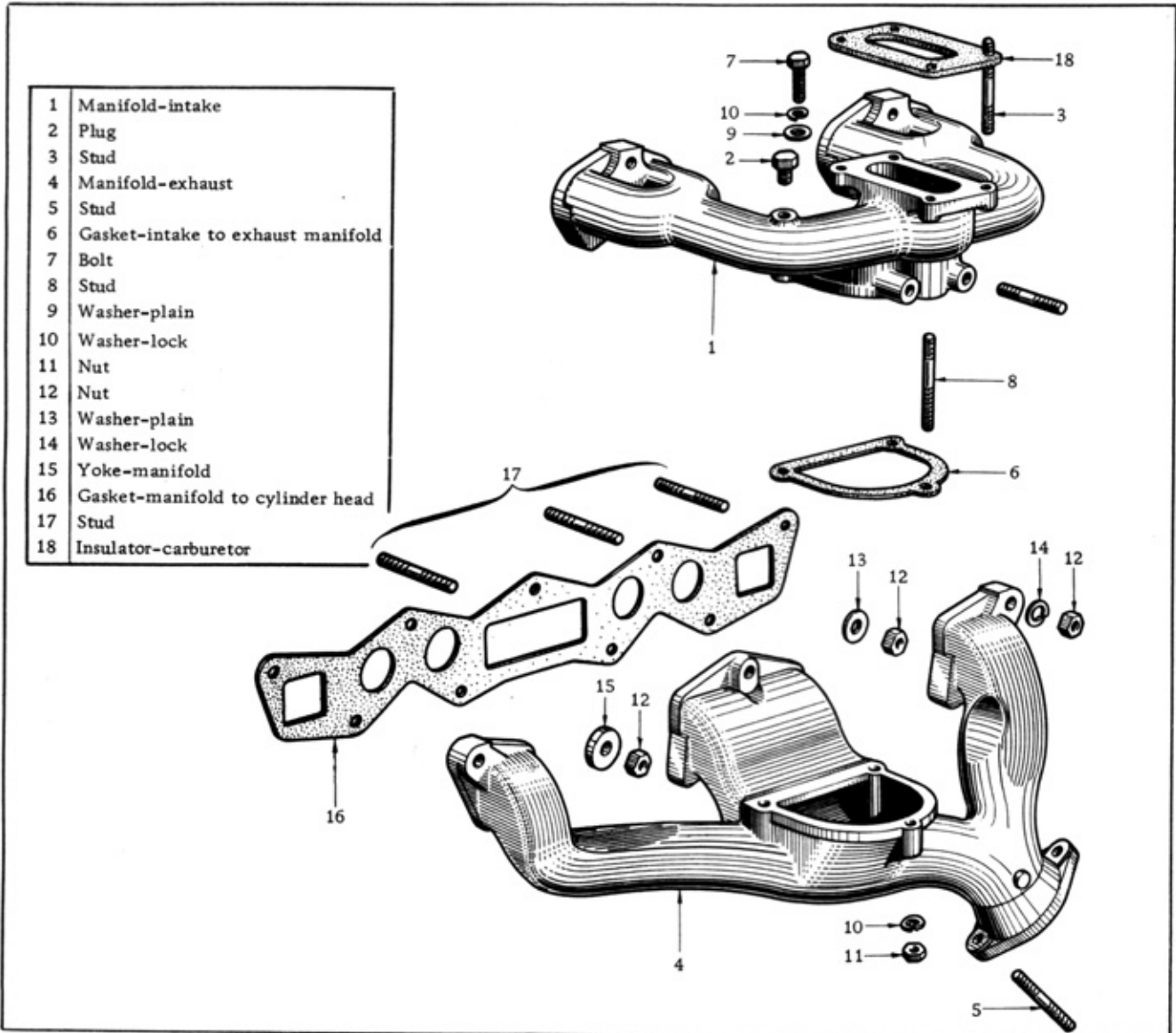
SECTIONAL VIEWS OF B10 TYPE ENGINE



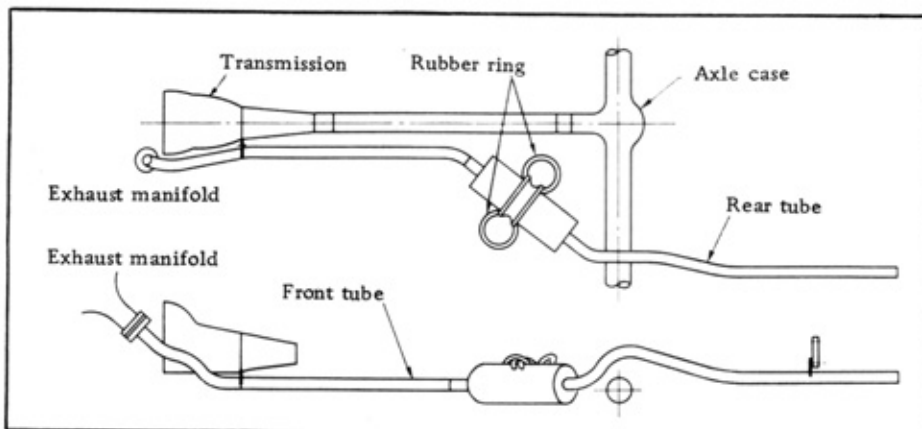
CYLINDER HEAD & CYLINDER BLOCK







Manifold



Exhaust Tube & Muffler

## SERVICE OPERATIONS WITH ENGINE IN POSITION

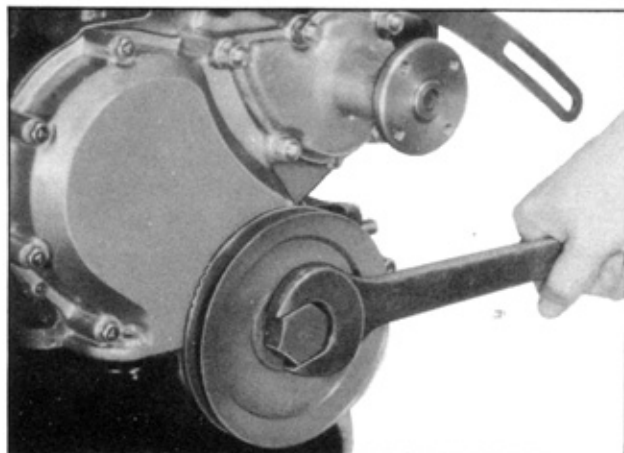
### Removing Starting Nut and Pulley

Remove the radiator. Slacken the dynamo attachment bolts and remove the fan belt.

Bend back the tab on the starting dog nut locking washer. Unscrew the starting dog nut by using Heavy duty "Shock type" spanner.

A few sharp blows in an anti-clockwise direction will slacken the nut.

Pull off the crankshaft pulley.



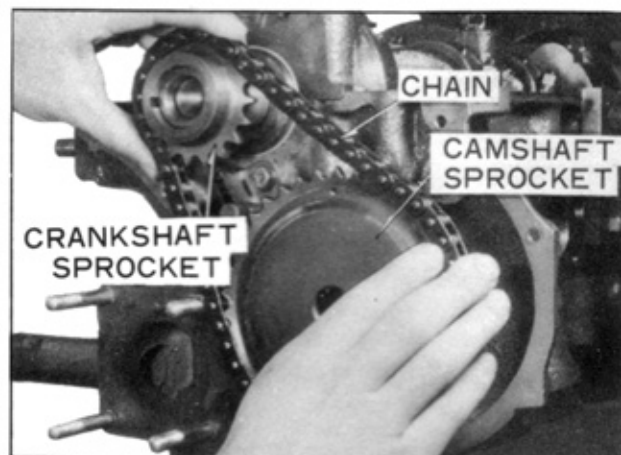
### Removing the Timing Cover

The timing cover is secured by set-screw bolts, each having a shakeproof washer and a special plain-washer. Note that the special washer is of elongated shape and is fitted next to the timing cover flange.

The spring washers are immediately below the bolt heads.

Take out the set-screw bolts, remove the cover and its joint washer. Care should be taken not to damage the washer when breaking the joint. If damage does occur fit a new washer, cleaning of the faces of the joint surfaces beforehand.

### Removing the Timing Gear



The timing chain is endless, and it is necessary to remove both the crankshaft and camshaft gears together. Before doing this, notice the timing marks on both gears and their relationship to each other.

Draw off both the gears a little at a time, first removing the crankshaft gear retaining nut.

As the gears are withdrawn care must be taken not to lose the packing washers from behind the crankshaft gear. Between the camshaft gear teeth, is a rubber ring which acts as a tensioner, and ensures silent operation of the chain drive. Examine the felt washer and renew it if oil has been lost by seepage.

### Refitting the Timing Gear

Replacing the components of the timing gear is largely a reversal of the dismantling process, but special attention should be paid to the following points.

Fit the crankshaft and camshaft gears into their respective shafts. Ensure the timing marks are opposite and in line.

Turn the engine crankshaft until the keyway is at T.D.C. and the camshaft with its keyway in approximately the one o'clock position.

## DATSUN 1000

Place the gears into position, ensuring that the keys are present in keyways on the shafts. Ensure that the timing marks on the gears are opposite to each other and in line. Drive the gears home.

The same number of packing washers taken from behind the crankshaft gear must be replaced unless a new crank or camshaft has been fitted. In this case the alignment of the gear faces and measure the alignment with a feeler gauge. To adjust the alignment it will be necessary to vary the number of packing washers.

Fit the oil thrower behind the crankshaft gear so that its concave face is towards the front of the car, and check that the felt washer is in position.

## ROCKER MECHANISM

### Valve Rocker Cover Removal

Remove the air cleaner. Unscrew the cap nuts securing the engine lifting brackets.

Remove the rocker cover and the cork joint washer.

### Removing the Rocker Assembly

Drain the cooling system. If anti-freeze is in use, use a clean container for the fluid.

It is necessary to drain the system and slacken the cylinder head bolts, because four of the rocker shaft fixing nuts also secure the cylinder head.

If the cylinder head bolts are not slackened distortion may result and allow water to find its way from the cooling system into the cylinder and pump.

Notice that under the right-hand rear rocker stud nut is a special locking plate. Completely unscrew the rocker-shaft bracket nuts and remove the rocker assembly. Complete with brackets and rockers.

### Dismantling the Rocker Shaft Assembly

To dismantle the rocker shaft assembly first remove the grub screw and locking plate from the rear rocker bracket.

Remove the split pins, flat washers and spring washers from each end of the shaft. Slide the rockers, brackets and springs from

the shaft. Unscrew the plug from the end of the shaft and clean out the oil way.

The two end rockers may be dismantled without the whole rocker assembly being drawn out. This may be achieved by turning the engine by hand until No. 1 push rod reaches its lowest position.

Unlock the tappet adjusting screw and screw it back as far as it will go.

Withdraw the split pin, flat and spring washer and slide the rocker off the shaft.

Sometimes the valve spring will have to be slightly compressed by levering a screwdriver under No. 2 rocker, thus allowing the end rocker to slide off the shaft easily. Repeat the procedure for No. 8 rocker.

### Reassembling the Rocker

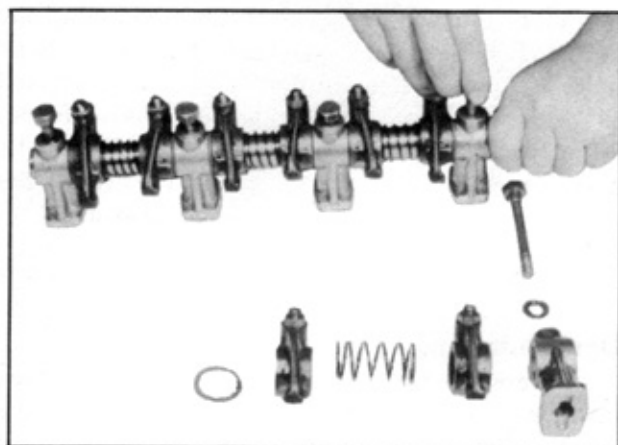


On reassembly tighten the pedestal bracket securing nuts a little at a time working diagonally from nut to nut, left nut of No. 1 pedestal bracket, right nut of No. 2, left of No. 3 and so on returning from the left nut of No. 4 bracket and repeating the process until they are all tight. If the rocker assembly has been completely stripped down and rebushed, the oil holes will have to be redrilled and the bushes reamed down to size before assembly on the shaft.



The rocker and spring must be replaced in their original position on the ends of the shaft. Remember to replace the rocker shaft locating screw and lock plate.

Replace the spring and flat washers with the split pins on the ends of the shaft. Replace the rocker cover and gasket.



*Reassembling the Cylinder Head*

The vent pipe should be at the front of the engine. Secure the cover by means of the two cap nuts, ensuring that the rubber bushes and engine lifting plates are in position. If the rocker cover gasket or the rubber bushes are found to be faulty, they must be renewed otherwise oil leaks will result.

## Push Rod Removal

If the valve rocker assembly has already been removed all that remains is for the push rods to be lifted out. They may on the other hand be taken out without detaching the rocker assembly.

Remove the air cleaner and rocker cover.

Slacken all the tappet adjusting screws to their full extent; then using a screwdriver, with the rocker shaft as a fulcrum, depress the valve spring, slide the rocker side ways and lift out the push rod.

All but the end push rods can be withdrawn in this way. These will have to be withdrawn after the removal of the two end rockers from the shaft. When replacing push rods ensure that the ball ends register in the tappet cups. From here onwards, reassembly is a straight forward reversal of the dismantling process.

## Adjusting Valve Rocker Clearances

Remove the air cleaner and rocker cover.

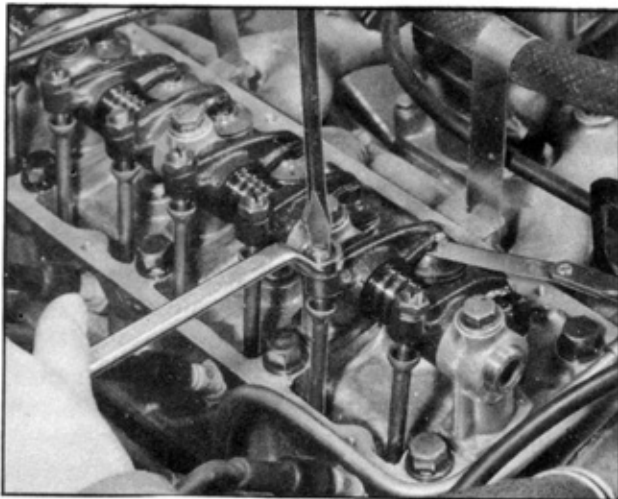
There should be a clearance of 0.014 in. (0.35 mm) between the face of the rocker and the base of the valve stem. Whilst checking the clearances it is important to maintain pressure with a screwdriver on the tappet adjusting screw to disperse the film of oil from the push rod cup. Failure to follow this procedure will result in a wrong reading being taken.

Turn the engine over by hand (starting handle) until the push rod stops falling, the valve is fully closed.

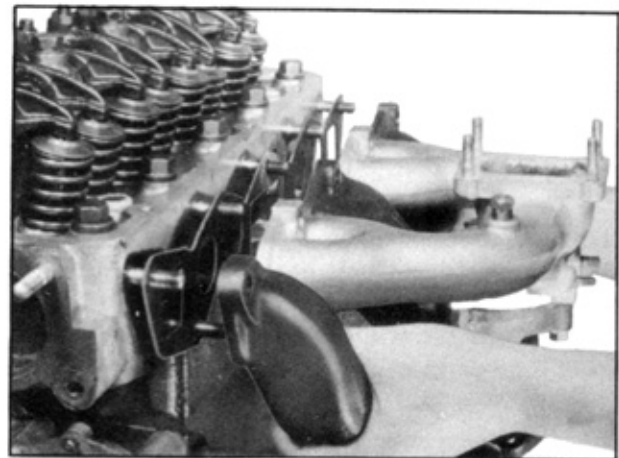
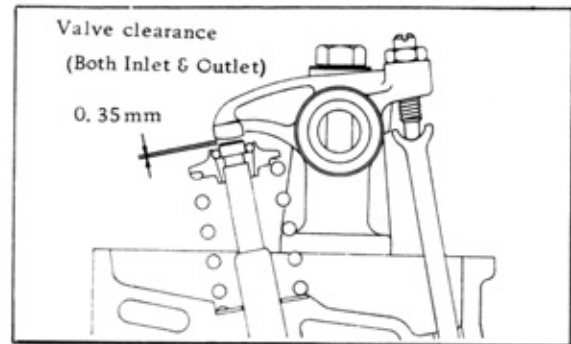
To adjust insert a screwdriver in the adjusting screw slot and slacken the lock nut. Then insert 0.014 in. feeler gauge between the face of the rocker and the valve stem. Raise or lower the adjusting screw until the correct clearance is obtained.

Tighten the lock nut and recheck the clearance.

It is important to note that while the clearance is being set, the tappet of the valve being adjusted must be on the back of the cam, opposite to its peak.



*Adjusting the Rocker Clearance*



## CYLINDER HEAD

### Removing the Cylinder Head

Drain water from the cooling system by opening the radiator and cylinder block drain cocks.

One is situated inlet tube at the backside of the radiator and other at the rear right-hand side of the engine. If anti-freeze mixture is in use it should be drained into a suitable container and retained for future use.

Disconnect the negative cable from the battery by extracting the terminal screw and removing the lug from the battery terminal post.

Slacken both the retaining clips on the hose connecting the radiator to the thermostat housing and remove the hose.

Extract the thermostat housing securing nuts and remove the housing and thermostat.

Remove the aircleaner, carburetor, rocker cover and the inlet and exhaust manifolds.

Detach the high tension cables and remove the sparking plugs, also disconnect the water temperature gauge connection from the thermostat housing.

Take off the rocker assembly not forgetting to slacken the external cylinder head nuts at the same time.

Withdraw the push rods keeping them in the order of removal.

The cylinder head can now be lifted off the cylinder block. To facilitate detaching the cylinder head joint, tap each side of the head with a hammer using a piece of wood interposed to take the blow. Do not use excessive force. When lifting the head a direct pull should be given so that the head is pulled evenly up the studs. Remove the cylinder head gasket.

### Decarbonising

Remove the cylinder head. With the valves still in position remove the carbon from the combustion chambers and the valve faces.

Leaving the valves in position for this operation ensure that damage cannot be caused to the seats by the wire brush which should be used for the removal of carbon.

If the exhaust valve heads are coated with a very hard deposit this may be removed by using a chisel shaped piece of hardwood.

Remove the valves, and using the wire brush clean out the carbon from the inlet and exhaust ports.

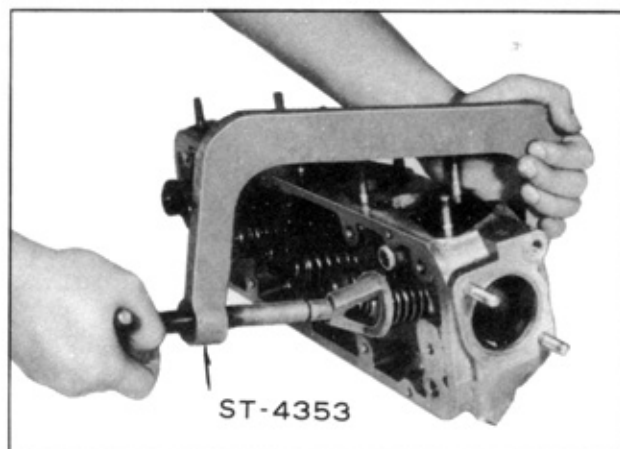
Blow out all traces of carbon dust with compressed air, and finally clean the ports with

gasoline and dry them. The carbon should now be removed from the piston crowns. Rotate the engine until the piston to be worked on is at T.D.C. Protect the other cylinder bore from the entry of carbon particles by pushing a non-fluffy rag into them.

Using a chisel shaped piece of hardwood. Carefully remove the carbon from the piston crowns. A ring of carbon should be left round the periphery of each piston, and the deposit round the top of the cylinder bore should not be touched. An indication as to when decarbonisation is require is generally given by an all round loss of power. Cars used mainly on short runs will require this attention more often than those used for long runs.

## Removal and Replacement of the Valves

Whilst the cylinder head is removed the valves can be taken out. To do this compress the valve spring with the speical valve spring compressor as shown in Figure.



*Valve Spring Compressor*

## Removal

Remove the two cap retaining collets.

Release the valve spring, the valve spring cap, valve oil seal (Inlet valve only) and its retainer. Withdraw the valve from the guide.

Keep the valves in their relative positions when removed from the engine, to ensure replacement in their original valve guides.

## Replacement

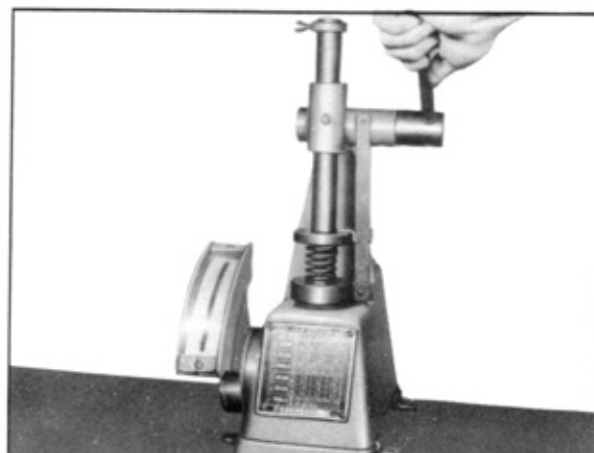
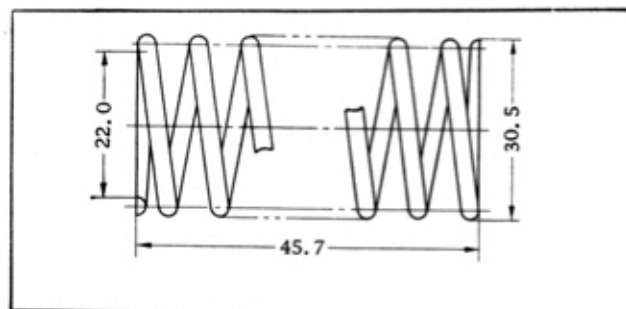
Note that the diameter of the exhaust valve heads are smaller than the inlet valve. To replace the valves, insert each valve into its guide and replace the spring, oil seal and retainer. Fit oil seal chamfered side downwards. The oil seals are more easily fitted if they have been soaked in engine oil for a short period before use. The oil seal is used for the intake valve only.

Replace the valve spring and compress the valve spring.

Refit the cap retainers and secure them by means of the valve cotters. Remove the compressor.

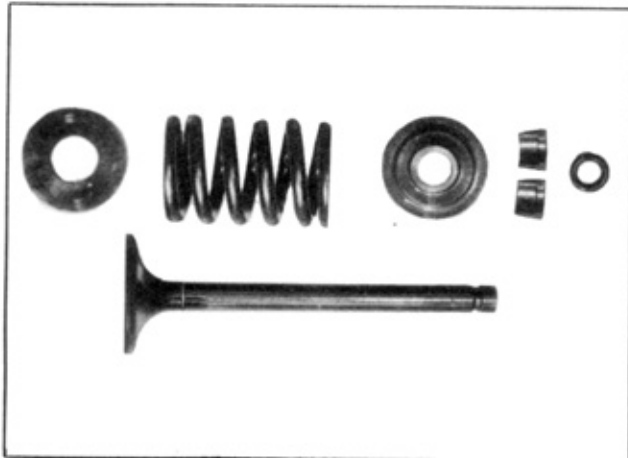
### *Spring Specification*

Wire diameter	mm	4.276
In. dia.	mm	22.0
Free length	mm	45.7
Coil turns		6.5
Effective coil turns		4.5
Spring constant	kg/mm	4.2
Pressed length 1st	mm/kg	38.5/30.0
Pressed length 2nd	mm/kg	31.0/61.2

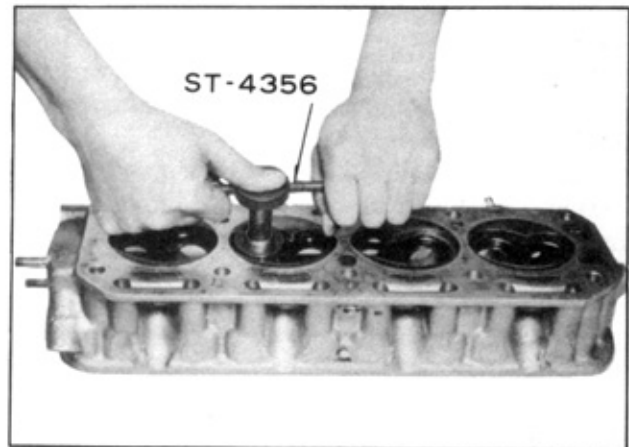


*Checking Spring Tension*

# DATSUN 1000



*Valve Spring & Valve*



*Turning the Valve Seating Cutter*

## Valve Grinding

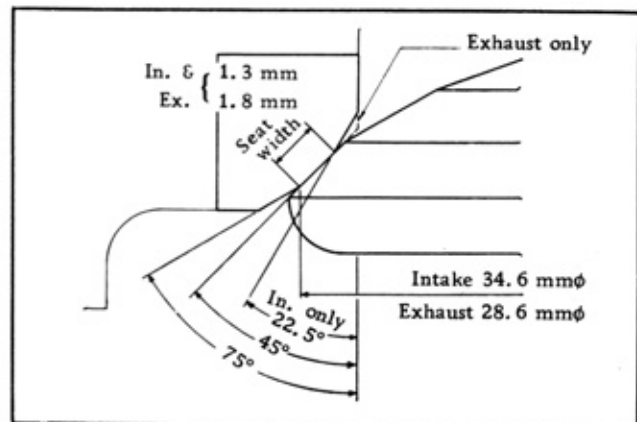
Before replacement of the cylinder head the valves and their seats should be examined for signs of pitting or burnt patches and distortion.

If these conditions are present, the valve seats must be recut before attempting to grind in the valves, whilst distorted valve heads should be trued or the valve renewed. Only the minimum amount of metal should be removed in the turning process.

When grinding a valve onto its seating, the valve face should be smeared lightly with grinding paste and then lapped in with a suction type grinding tool. The valve must be ground to its seat with a semi rotary motion. A light coil spring interposed between the valve head and the port will assist considerably when lifting the valve in order to rotate the face to a different position. This should be done frequently to spread the grinding compound evenly.

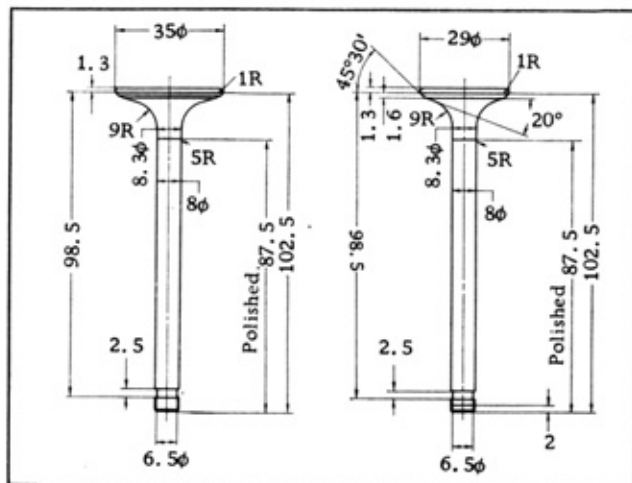
It is necessary to continue the grinding process until an even mat surface is produced on the seating and the valve face.

On completion, the valve seats and ports should be thoroughly cleaned with gasoline soaked rag; and dried, and the subjected to a compressed air blast. The valves should be washed in gasoline and all traces of grinding compound removed.



## VALVES

Valve head diameter		
Intake valve		35.0 mm
Exhaust valve		29.0 mm
Valve seat width	In. Ex.	1.3 mm 1.8 mm
Valve stem outer diameter (both intake and ex.)		8.7 mmφ (-0.01, -0.02)
Overall length		
Intake valve		109.54 mm
Exhaust valve		108.74 mm

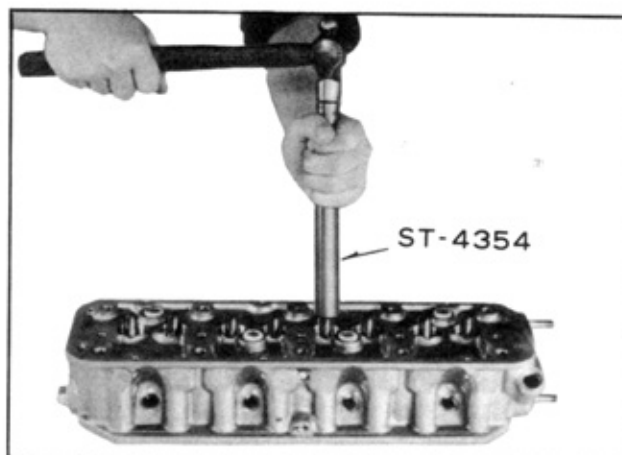


Intake Valve

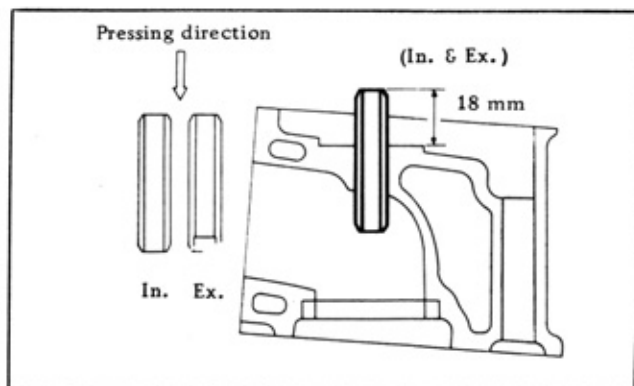
Exhaust Valve

## VALVE GUIDE

### Removing and Refitting Valve Guide



Fitting position of a valve guide after warming up the cylinder head 200°C.



Location of Valve Guide to be Fixed

unit: mm

		Standard accuracy	Clearance limit
Clearance between valve stem & guide	In.	0.020 ~ 0.040	0.10
	Exh.	0.045 ~ 0.065	

Reamer for guide of cylinder head	
SST No. ST-4355	Finishing dimension
S. T. D.	12 $\phi$ H6 +0.011 0
O. S.	12.5 $\phi$ H6 +0.011 0

### Valve Guide Service Parts

Standard tight mm		0.025 ~ 0.040
Part No.		Reamer SST NO
In.	13212 18010 O. S.	ST-4355
	13212 18000 S. T. D.	ST-4355
Ex.	13213 18010 O. S.	ST-4355
	13213 18000 S. T. D.	ST-4355

Remove the cylinder head.

Remove the appropriate valve and spring. Reset the cylinder head with its machined face downwards on a clean surface and drive the guide downward into the combustion space with a drift.

This should take the form of hardened steel punch.

When fitting new valve guides, these should be driven in from the top of the cylinder head.



# DATSUN 1000

## Removing a Valve Spring in Position

In an emergency a new valve spring can be fitted without removing the cylinder head. When doing this, the applicable piston must be brought to its T.D.C. position to eliminate any possibility of the valve falling into the cylinder.

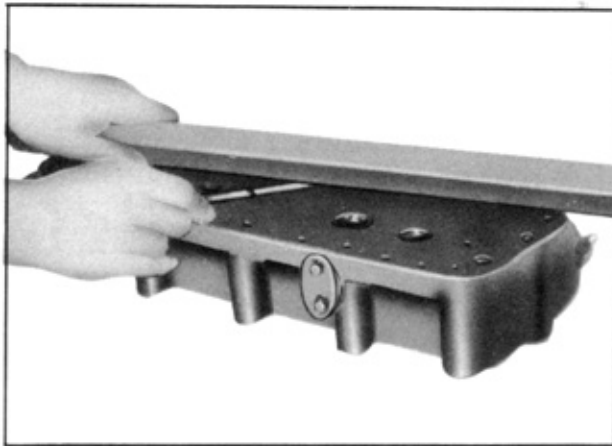
Remove the spark plug from the cylinder concerned. Hold the valve onto its sealing with the aid of a suitable tool such as a bent screwdriver which will pass through the sparking plug orifice, and locate on the valve head. By using the rocker shaft, as a fulcrum point, the spring can be compressed with two screwdrivers or a fork ended bar.

Withdraw the valve cotters and renew the valve spring.

## Refitting the Cylinder

Ensure that the cylinder head and cylinder block joint faces are clean.

The cylinder head gasket is marked "Top" so that it will be placed head in correctly.



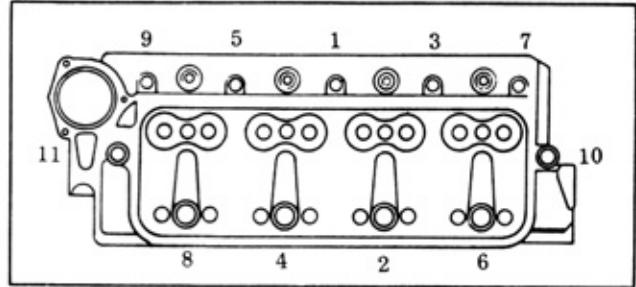
*Cylinder Head Distortion Measurement*

Place the gasket into position and lower the cylinder head into place. Fit the cylinder head securing nuts finger tight.

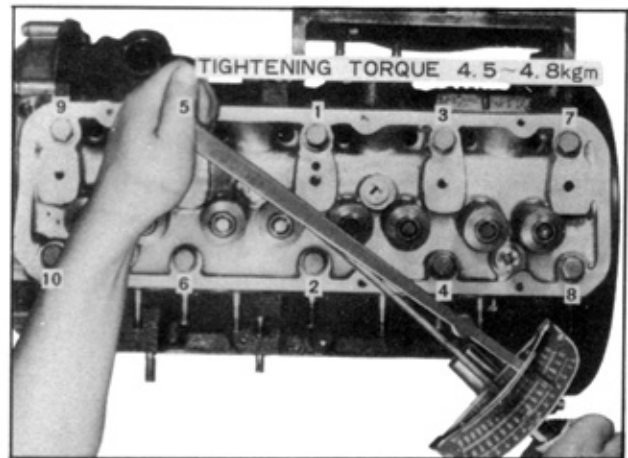
Insert the push rods, replacing them in the positions from which they were taken.

Screw back all the tappet adjusting screws. Replace the rocker assembly and screw down the securing nuts finger tight. Evenly tighten the ten cylinder head bolts a little at a time

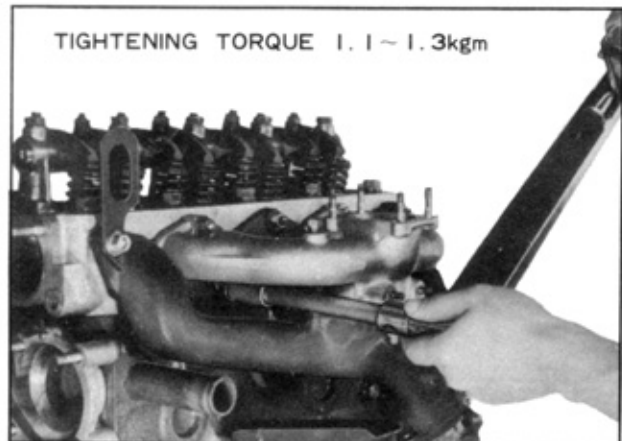
in the order given in Figure, finally pulling them down with a torque wrench set to 4.5 lbs./ft.



*The Order of Tightening the Cylinder Head Nuts*



Reset the valve clearances, and finally check them when the engine is not hot or cold. The cylinder head bolts may pull down slightly more after the engine has attained its normal working temperature, in which case the valve clearances will have to be checked again and reset if necessary.



Refit the inlet and exhaust manifolds.

Fit the carburetor and reconnect the control linkage. Refit the ignition advance suction pipe to the connection on the carburetor, but do not at this stage refit the air cleaner or it will have to be removed later to check the valve clearances. Replace the rocker cover taking care to fit the cork gasket correctly.

Place the thermostat and its housing in position and secure with the three nuts.

Reconnect the water temperature gauge wire and fit the radiator hose to the thermostat housing. Connect the cables to the battery. Ensure that the radiator and cylinder block drain tapes are closed, and refill the radiator.

Clean and adjust the sparking plugs and refit them, clipping on the high tension leads. The firing order of the engine is 1-3-4-2. Replace the clip which secures part of the electrical wiring harness to the side of the head.

The ignition can now be switched on and the engine started. When the normal operating temperature has been reached switch off and remove the rocker cover so that the valve clearances may be rechecked. Replace the rocker cover and fit the air cleaner when the final check has been made.

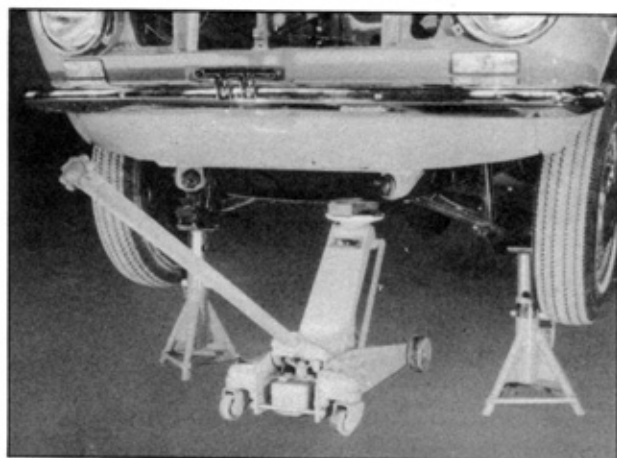
Whilst the engine is running check that the water hose connections and fuel line unions do not leak. Tighten them if necessary.



**DATSUN 1000**



## REMOVING &amp; REFITTING



Experience has shown that it is much easier to remove the engine and transmission as a single unit than to detach the engine by itself.

To remove the engine and transmission upwards, proceed as follows;

Completely drain the cooling system and the transmission, disconnect and remove the battery and its supporting tray.

Remove the upper and lower radiator hoses by undoing the retaining clips.

Disconnect the capacitor lead at the distributor, also the high tension and switch wires at the coil.

Take off the dynamo lead and disconnect the starter motor cable at the motor end.

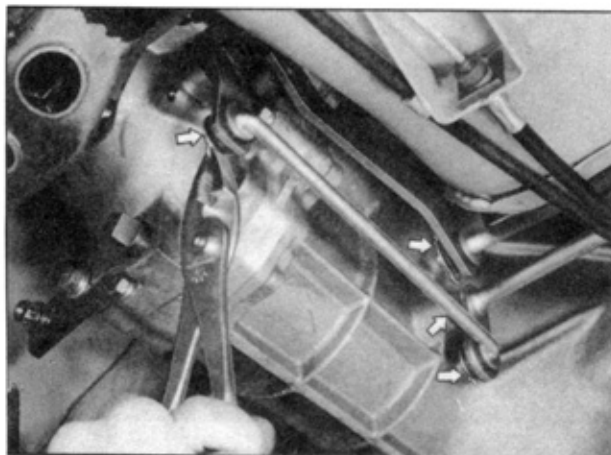
Remove the oil gauge and water, temperature gauge leads from their terminals on the engine.

The throttle and choke controls must be disconnected from the carburetor. Disconnect the fuel pipe from the fuel pump.

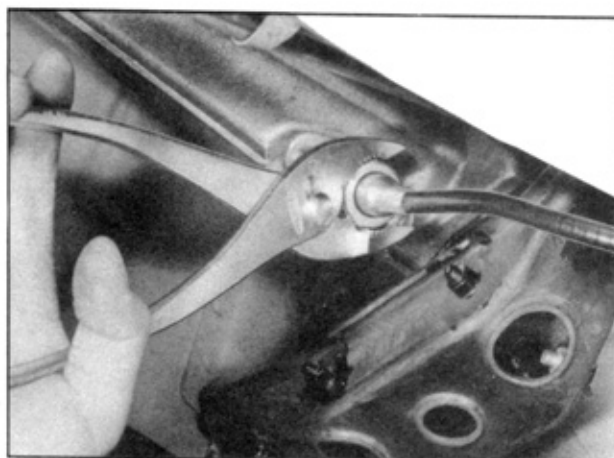
Next, remove the exhaust pipe from the manifold.

From below the vehicle, remove the gear change selector rod from the lever on the transmission casing.

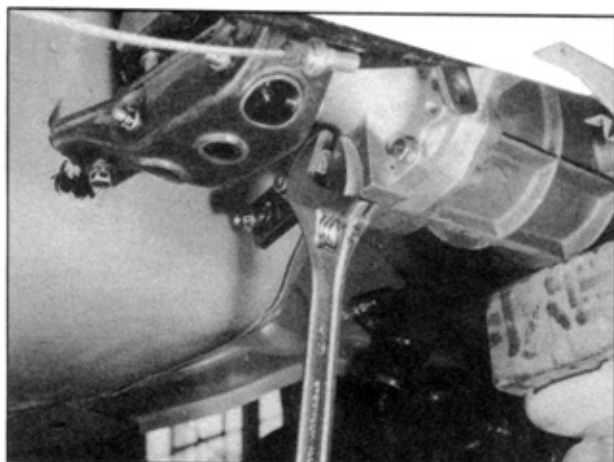
Disconnect the earth strap from the starter motor. Remove the hand brake control rod supporting from transmission.



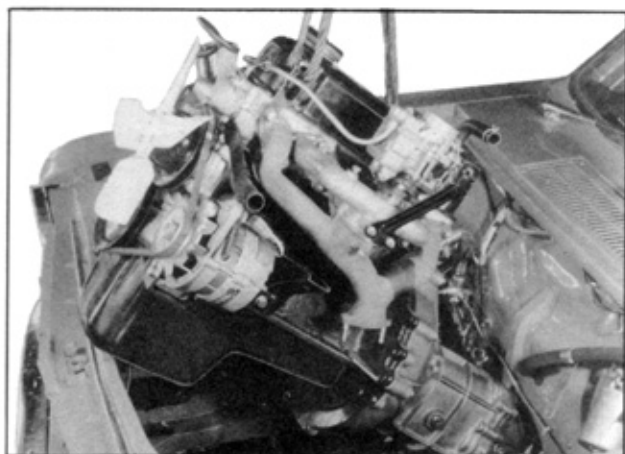
Disconnect the speedometer cable from the transmission.



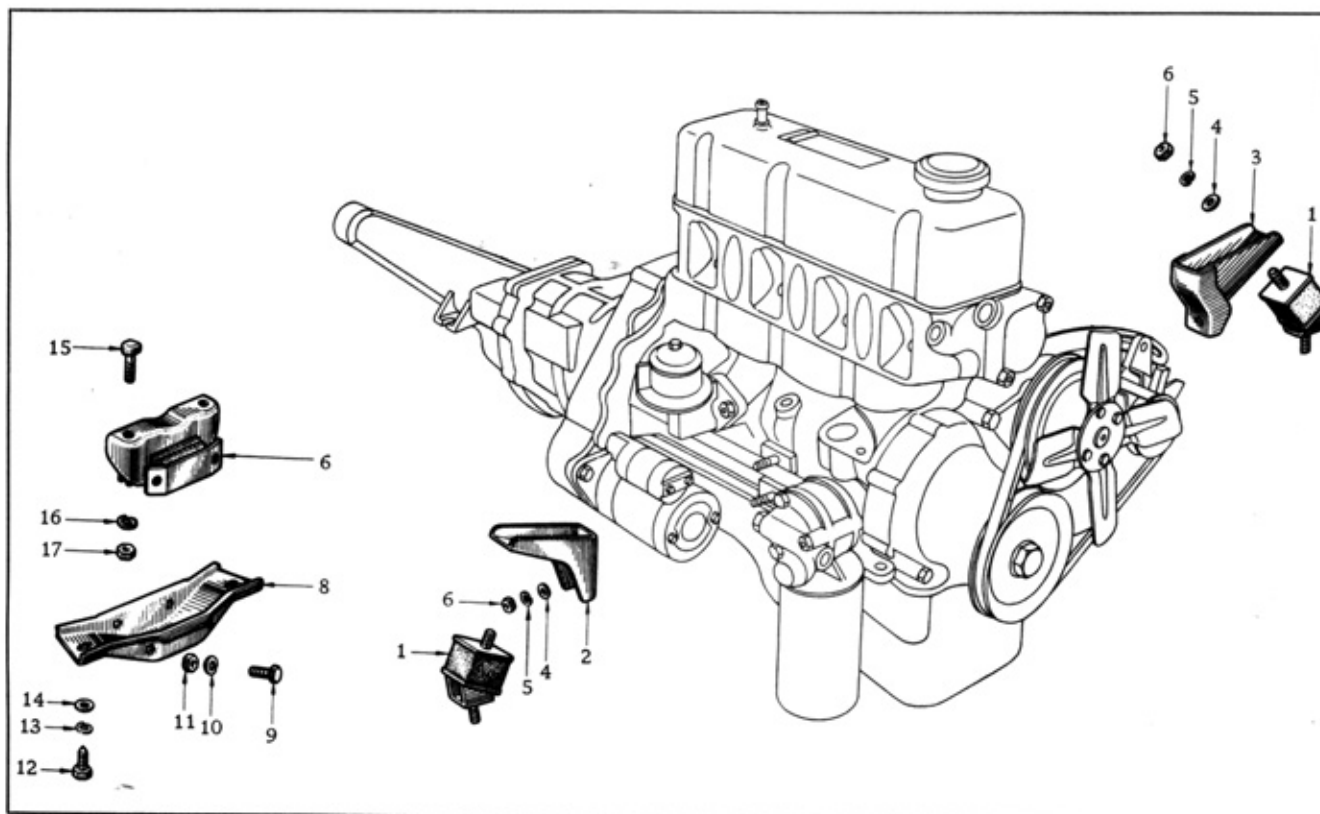
Uncouple the propeller shaft pinion franges at rear axle and draw the shaft out of the transmission.



# DATSUN 1000

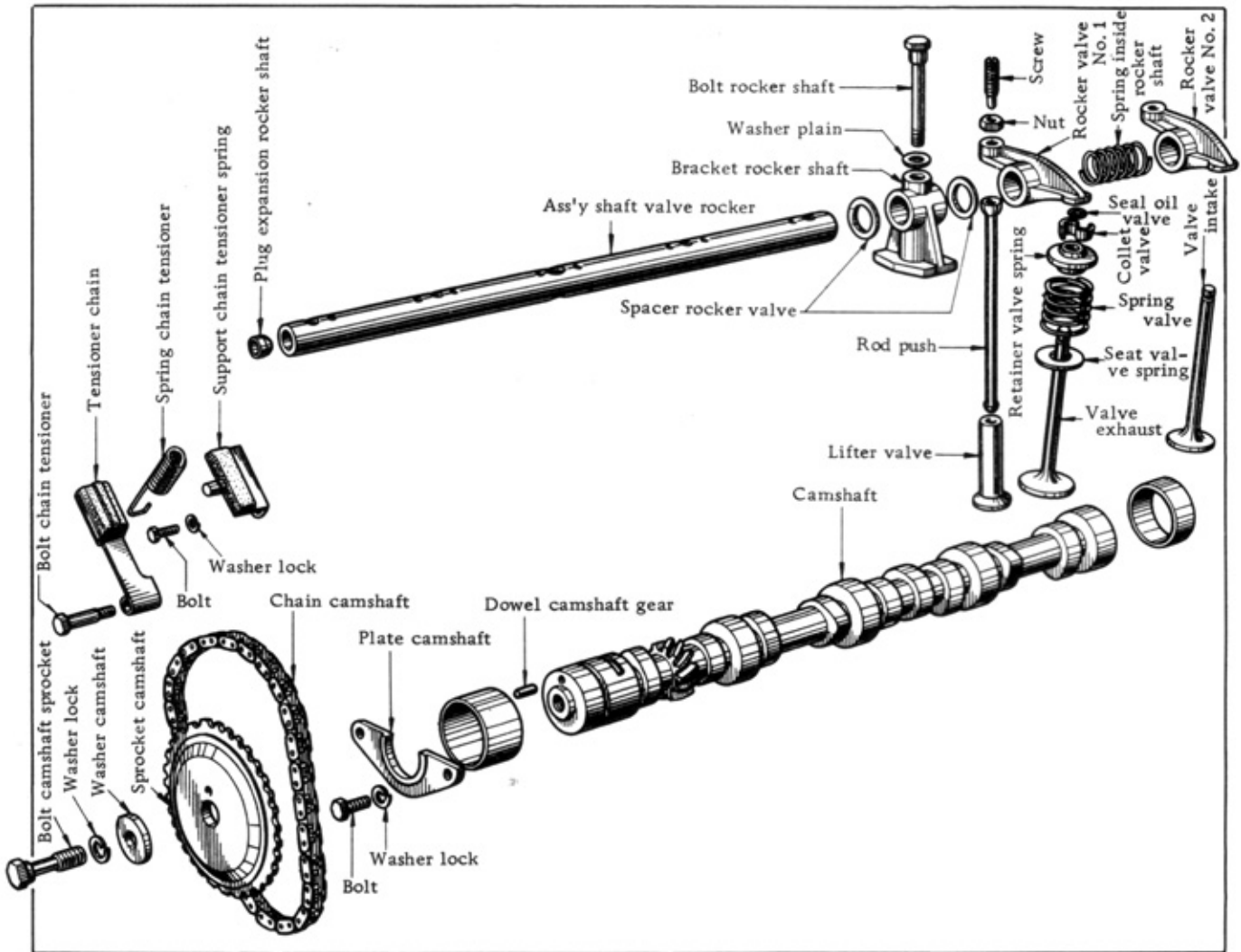


## OPERATION WITH THE ENGINE REMOVED

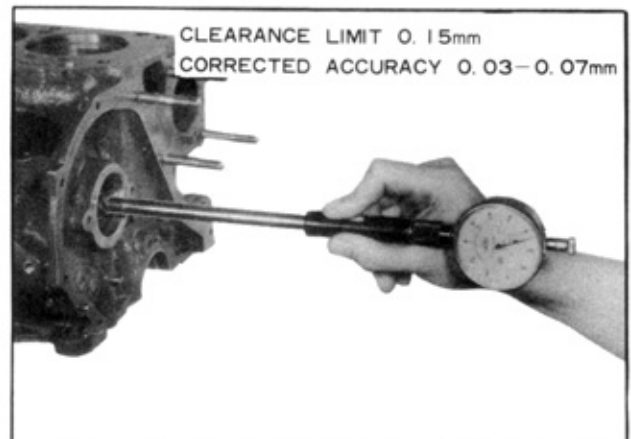
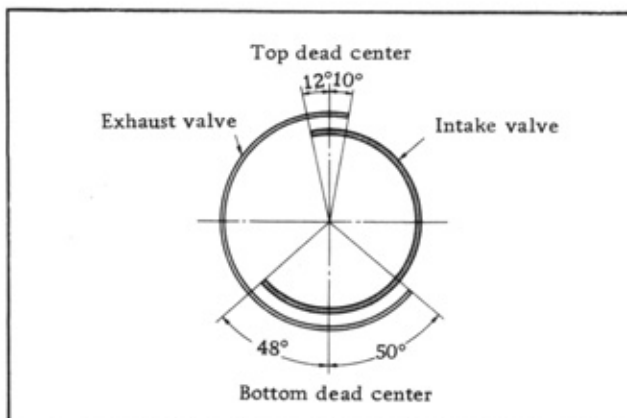


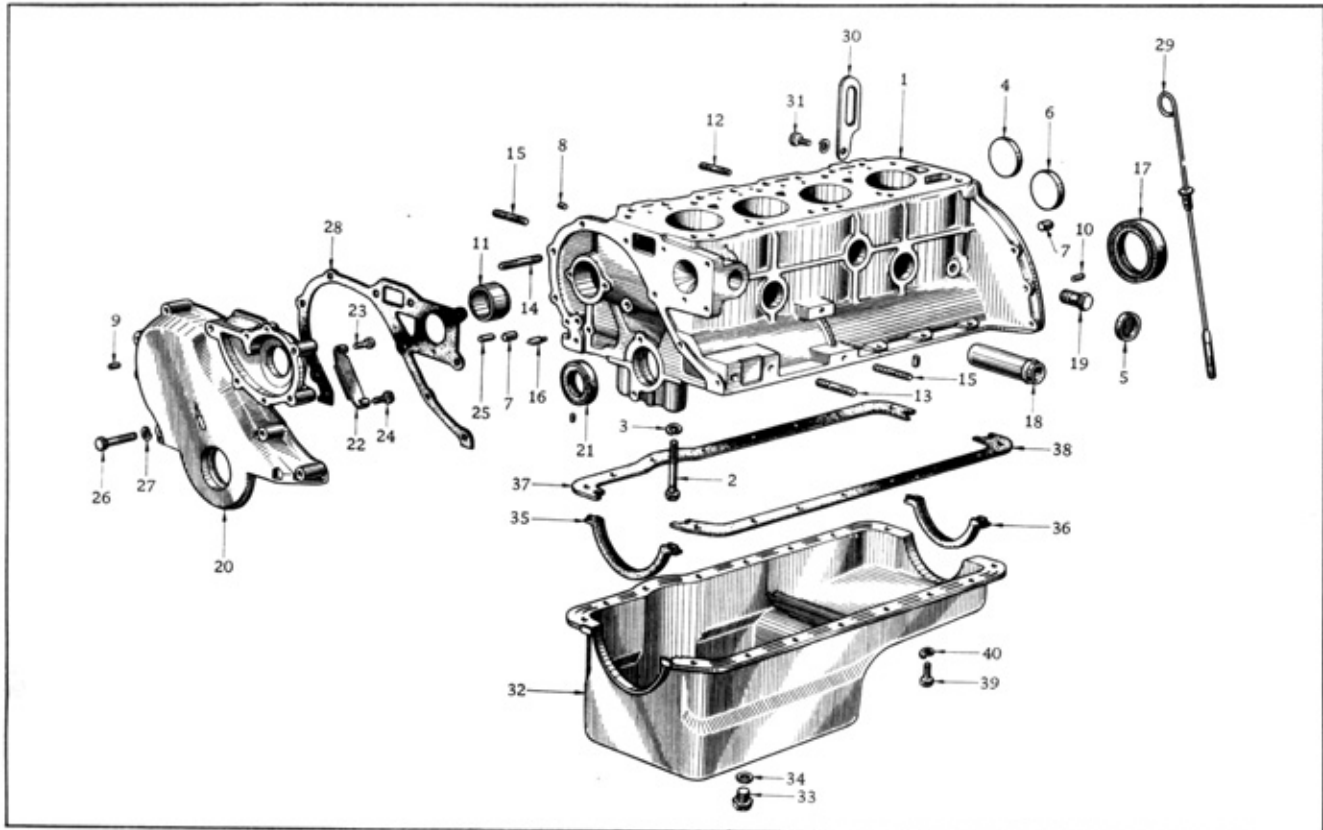
*Engine Mounting*

1	Insulator-engine mounting front	7	Ass'y-insulator, engine mounting rear	13	Washer-lock
2	Bracket-engine mounting front (R. H)	8	Member-engine mounting rear	14	Washer-plain
3	Bracket-engine mounting front (L. H)	9	Bolt	15	Bolt
4	Washer-plain	10	Washer-lock	16	Washer-lock
5	Washer-lock	11	Nut	17	Nut
6	Nut	12	Bolt		



Camshaft & Valve Mechanism





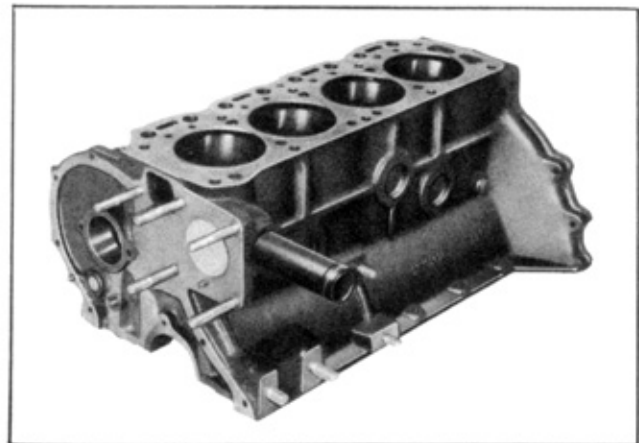
Cylinder Block

1	Ass'y-block, cylinder	15	Stud	28	Gasket-timing chain cover
2	Bolt	16	Jet-oil, timing chain	29	Gauge-oil level
3	Washer-lock	17	Seal-oil, crank shaft rear	30	Slinger-engine front
4	Plug-taper	18	Pipe-suction	31	Bolt
5	Plug-taper	19	Plug-water drain	32	Ass'y-oil pan
6	Plug-taper	20	Ass'y-cover, timing chain	33	Plug-drain
7	Plug-crank case oil gallery	21	Seal-oil, crank shaft front	34	Gasket-drain plug
8	Plug-blind	22	Tensioner-chain, tension side	35	Seal-oil, oil pan front
9	Dowel-timing chain cover	23	Support-tensioner, tension side	36	Seal-oil, oil pan rear
10	Dowel-timing chain locating	24	Bolt	37	Gasket-oil pan (R.H)
11	Set-bushing, camshaft	25	Dowel-water pump	38	Gasket-oil pan (L.H)
12	Stud	26	Bolt	39	Bolt
13	Stud	27	Washer-lock	40	Washer-lock
14	Stud				

### Cylinder Block

The cylinder block made of special cast iron has sufficient rigidity despite its compact and light construction.

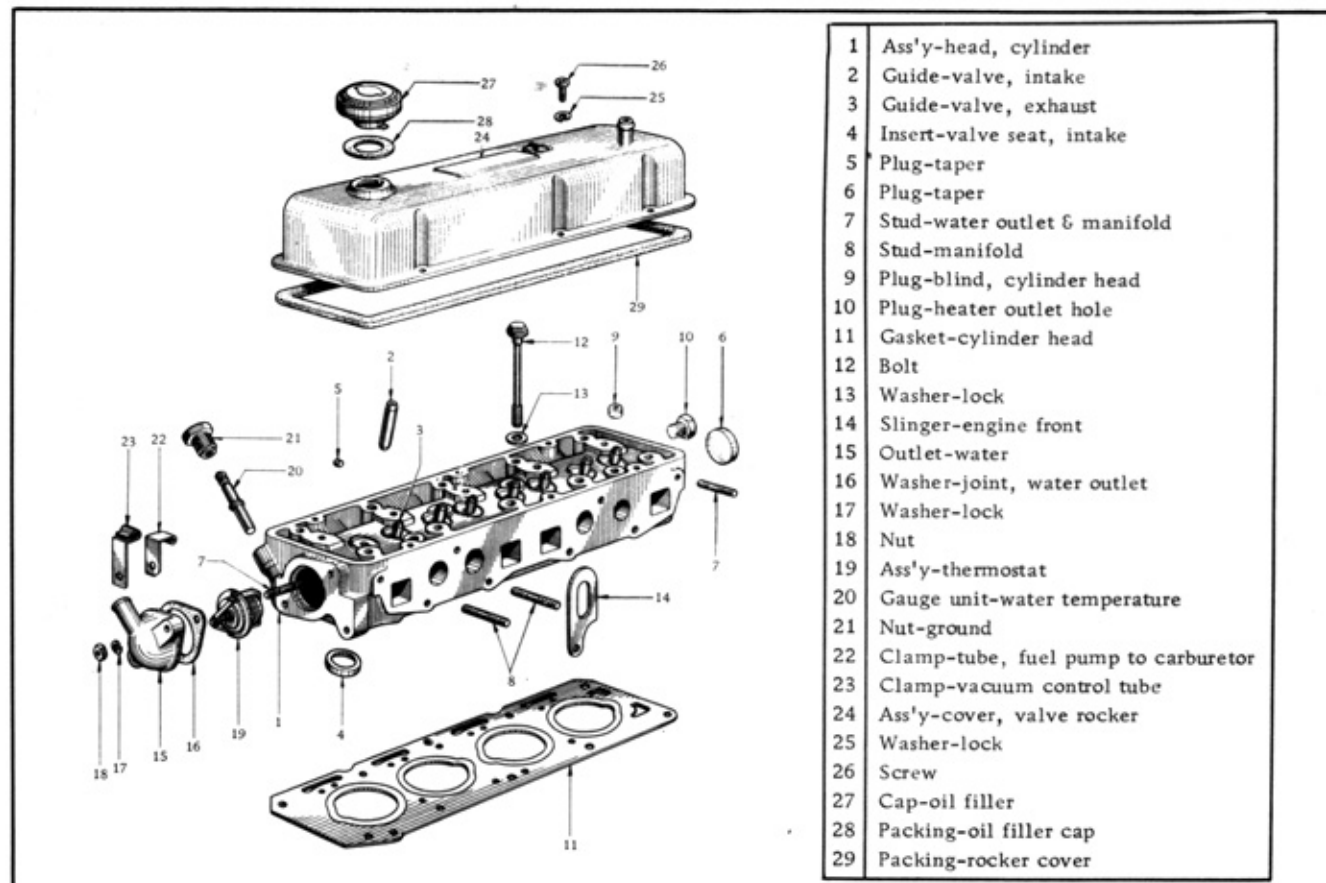
The flange is provided at the rear side of the cylinder block to connect with the transmission directly.



## Camshaft

Clearance	0.03 - 0.07 mm
Limit of bent	0.05 mm
Camshaft bore in crankcase --- out of roundness	Less than 0.03 mm
End play	0.02 - 0.08 mm
Cam height (Intake and exhaust)	36.45 - 36.55 mm
Wear limit of cam height	0.5 mm

Size	Camshaft Lapped Dimension mm (Bushing Part No.)				
	No. 1 (front)	No. 2	No. 3 (center)	No. 4	No. 5 (rear)
S.T.D.	43.793-43.806 (13005-18001)	43.283-43.296 (13006-18001)	42.783-42.796 (13007-18001)	42.283-42.296 (13008-18001)	41.218-41.231 (13009-18001)
U.S. 0.25	43.543-43.556 (13005-18002)	43.033-43.046 (13006-18002)	42.533-42.546 (13007-18002)	42.033-42.246 (13008-18002)	40.968-40.981 (13009-18002)
U.S. 0.50	43.293-43.306 (13005-18003)	42.783-42.796 (13006-18003)	42.283-42.296 (13007-18003)	41.783-41.796 (13008-18003)	40.718-40.731 (13009-18003)
U.S. 0.75	43.043-43.056 (13005-18004)	42.533-42.546 (13006-18004)	42.033-42.046 (13007-18004)	41.533-41.546 (13008-18004)	40.468-40.481 (13009-18004)



Cylinder Head



## Removing and Replacing the Tappets

Remove the carburetor and the rocker cover, then take off the manifolds.

Disconnect the high-tension leads sparking plugs, remove the rocker assembly and withdraw the push rods, keeping them in their respective positions.

To remove the tappet, pull out the tappets from the side of camshaft when drawing out the camshaft, also keeping them in same locations.

New tappet should be fitted by selective assembly so that they fall into the guides under their own weight when lubricated.

Assembly is a reversal of the above procedure, but care should be taken to see that the rockers are adjusted to give the correct valve clearance.

## Piston and Connecting Rod Removal

Drain the cooling water from the engine and radiator. Drain and remove the sump from the engine, then disconnect and remove the oil strainer. Take out the setscrews and rock

washers from the big-ends and withdraw the caps. It will be noted that the caps are off-set; When used parts are replaced after dismantling it is essential they are fitted into their original positions. To ensure correct refitting mark the caps and connecting rods on the sides to identify them together. The piston and connecting rods must be with drawn upwards through the cylinder bores.

Release the connecting rod from the crankshaft and slowly push the piston and rod upwards through the cylinder bore.

### NOTE:

It may be necessary to remove the ring of carbon or lip from the top of the cylinder bore with a hand scraper to avoid risk of piston ring breakage.

Remove the assembly from the top of the cylinder block.

Check the crankpins for oval with a pair of micro meter calipers, and examine the bearing surface for scoring, either defect will necessitate the removal of the crankshaft for regrinding.



*Removing Connecting Rod with Piston*

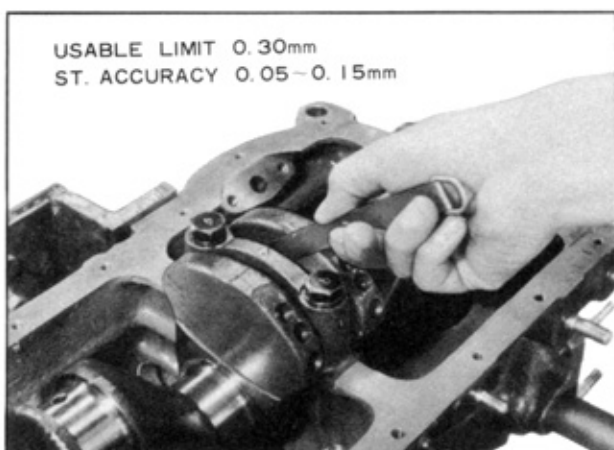
## CONNECTING ROD

Difference in weights of connecting rods in one engine .....	Less than 5 gr.
Limit of bent or twist ..	0.05 mm
Side clearance .....	0.2 - 0.3 mm
Connecting rod bearing clearance .....	0.01 - 0.05 mm
Crank pin bore diameter .....	44.961 - 44.974 mm

*Connecting Rod Bushing (for replacement)*

Part No. & Size	Bushing Thickness	Lapped dia. of Crankpin
12111-18000 S.T.D.	1.500-1.508 mm	44.961-44.974 mm
12111-18001 U.S. 0.08	1.540-1.548 mm	44.881-44.984 mm
12111-18002 U.S. 0.12	1.560-1.568 mm	44.841-44.854 mm
12111-18003 U.S. 0.25	1.625-1.633 mm	44.711-44.724 mm
12111-18004 U.S. 0.50	1.750-1.758 mm	44.461-44.473 mm
12111-18005 U.S. 0.75	1.875-1.883 mm	44.211-44.224 mm
12111-18006 U.S. 1.00	2.000-2.008 mm	43.961-43.874 mm

**CRANKSHAFT**



USABLE LIMIT 0.30mm  
ST. ACCURACY 0.05 - 0.15mm

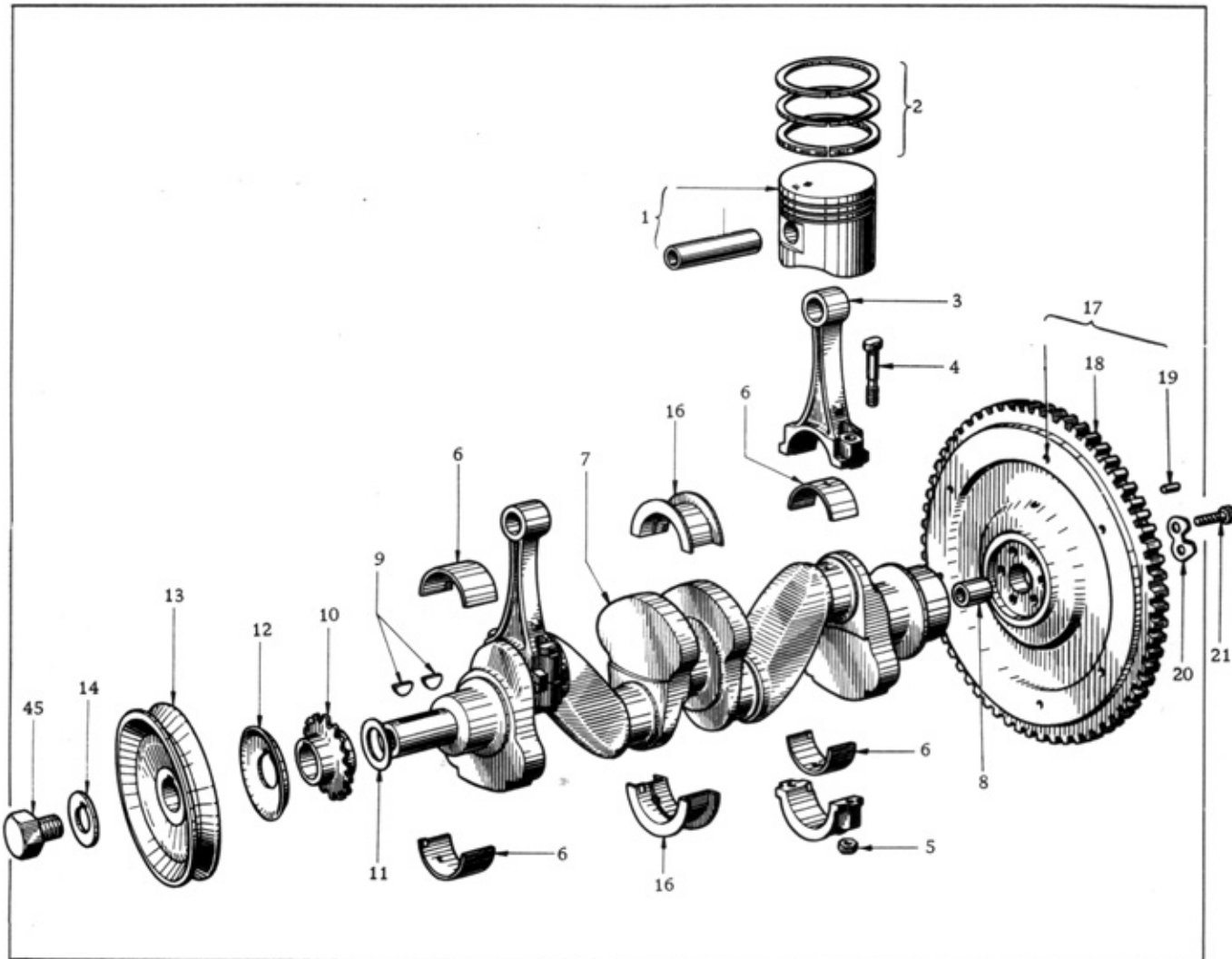
- Main bearing journal  
--- out of round ..... Less than 0.03 mm
- Crankpin --- out of  
round ..... Less than 0.03 mm
- Limit of bent ..... Less than 0.05 mm
- Crankshaft/main  
bearing --- end play . 0.05 - 0.15 mm
- Bearing clearance  
limit ..... 0.1 mm

*Main Bearing Bushing (for replacement)*

Part No. & Size	Bushing Thickness	Lapped Dia. of Journal
12215-18000 (front & rear) S.T.D. 12247-18000 (center)	1.827-1.835 mm	49.951-49.961 mm
12215-18001 (front & rear) U.S. 0.25 12247-18001 (center)	1.952-1.960 mm	49.701-49.714 mm
12215-18002 (front & rear) U.S. 0.50 12247-18002 (center)	2.077-2.085 mm	49.451-49.464 mm
12215-18003 (front & rear) U.S. 0.75 12247-18003 (center)	2.202-2.210 mm	49.201-49.214 mm
12215-18004 (front & rear) U.S. 1.00 12247-18004 (center)	2.327-2.335 mm	48.951-48.964 mm

The shell bearing are removable by hand. The bearings are require no "bending in" it is being only necessary to ensure that the housings are scrupulously clean and dry, and to place the bearings into position with the tangs located in their corresponding slots. Always renew bear-

ings if they are scored or damaged in any way, or following the regrinding of the crankshaft bearings will be required and the kinds of sizes available are -8, -12, -25, -50, -75 and -100 (with punched mark).



*Piston & Crank Shaft*

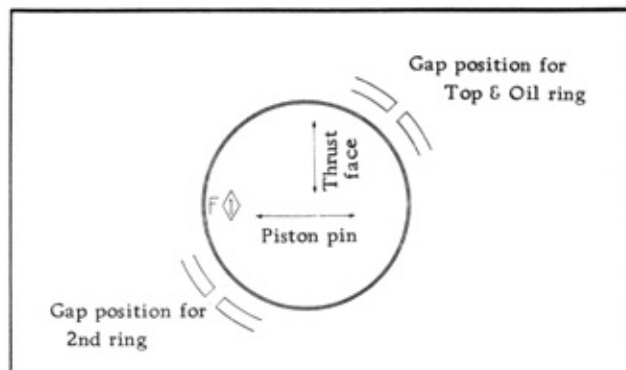
1	Set-piston, with piston pin	12	Thrower-oil, crank shaft
2	Set-ring, piston	13	Pulley-crank shaft
3	Ass'y-rod, connecting	14	Washer-lock, pulley bolt
4	Bolt-connecting rod	15	Bolt-crank pulley
5	Nut	16	Set-bushing, main bearing
6	Bushing-connecting rod	17	Ass'y-flywheel
7	Ass'y-crank shaft	18	Gear-ring, flywheel
8	Bushing-pilot	19	Dowel-flywheel
9	Key-woodruff	20	Washer-flywheel
10	Sprocket-crank shaft	21	Bolt-flywheel
11	Washer-packing, crank shaft		

## PISTON

### Replacing Pistons and Connecting Rods

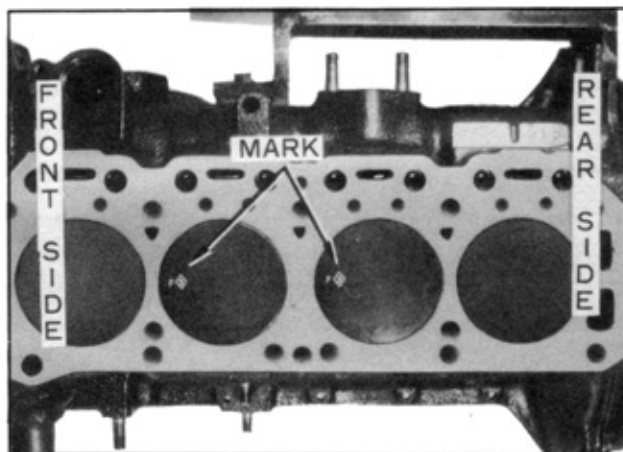
Insert each piston and connecting rod assembly into the cylinder from which it was taken; it is essential that the split in the skirt of the piston is positioned towards the camshaft.

Compress the piston rings with inserting piston using tool, and gently tap the crown of the piston with the wooden end of a hammer handle, until the piston is clear of the piston ring clamp.

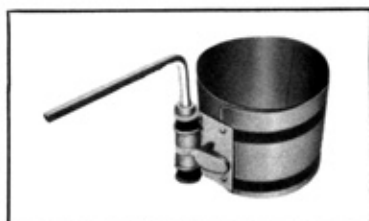


*Direction of Ring Gap*

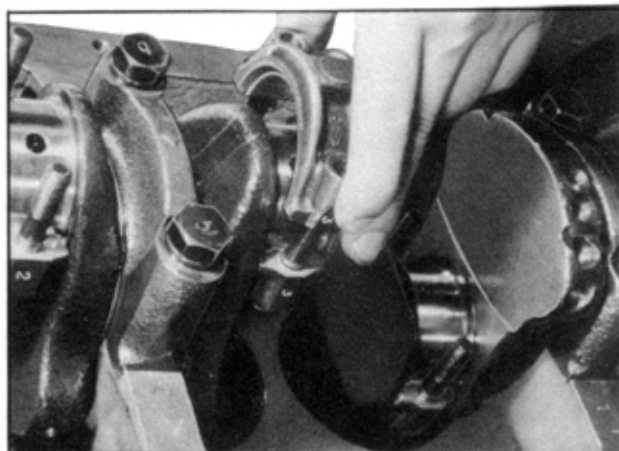
Now push the piston down the cylinder block until the big end of the connecting rod just protrudes through the bottom of the cylinder bore, then position upper half bearing shells.



*Inserting the Piston*



*Piston Adaptor*



### *Bushing of Connecting Rod (service parts)*

Part No. & Size	Thickness of Bushing	Finished Dimension of Crankpin
12111-18000 S.T.D.	1.500-1.508 mm	44.961-44.974 mm
12111-18001 U.S. 0.08	1.540-1.548 mm	44.881-44.894 mm
12111-18002 U.S. 0.12	1.560-1.568 mm	44.841-44.854 mm
12111-18003 U.S. 0.25	1.625-1.633 mm	44.711-44.724 mm
12111-18004 U.S. 0.50	1.750-1.758 mm	44.461-44.474 mm
12111-18005 U.S. 0.75	1.875-1.883 mm	44.211-44.224 mm
12111-18006 U.S. 1.00	2.000-2.008 mm	43.961-43.974 mm

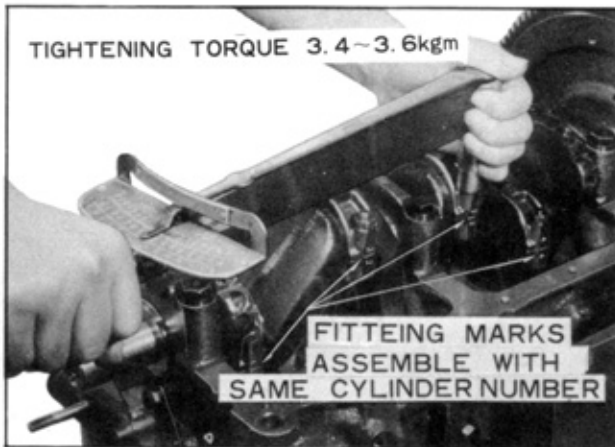
# DATSUN 1000

## NOTE:

Each upper and lower bearing has two oil holes, there by ensuring sufficient and it is of the greatest importance that the corresponding oil hole in the bearing shell registers with the oilway to provide an unobstructed passage.

Pull the connecting rod onto the crankpin taking the shell into the connecting rod cap; position the cap and the locking washers.

Insert the setscrews and tighten with a torque wrench to 3.4 ~ 3.6 kg-m.



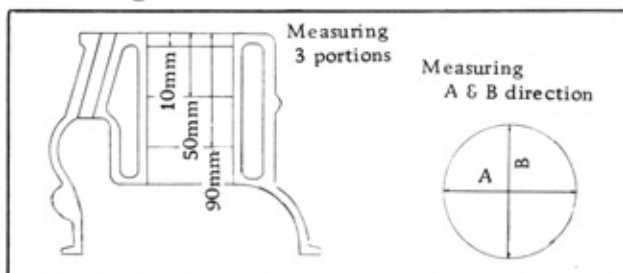
*Measuring Thrust Clearance of Connecting Rod*

Finally knock back the lock washers.

Check the connecting rod big end for side clearance (0.4 mm) and see that the shell bearings are not binding on the crankpin when rotating the crankshaft. If it is difficult to turn, undo the big end and examine the shell and seat for dirt or grit.

Before reassembling always apply a little clean oil to the piston surfaces and into the cylinder bore. Never file the connecting rod caps or their mating surfaces as this creates oval in the bearing.

## Removing a Piston



*Measuring for Bore Size*

Remove the pin from the small end of the connecting rod and press out the gudgeon pin. The gudgeon pin is press fit in piston.

unit : mm

		Correctional accuracy	Wear limit
Inner dia.		+0.05 0	0.2
Allowable error of cyl. inner dia.	Elips	0.015	-
	Taper	within 0.020	-
Difference of inner dia., each cyl.		within 0.05	-

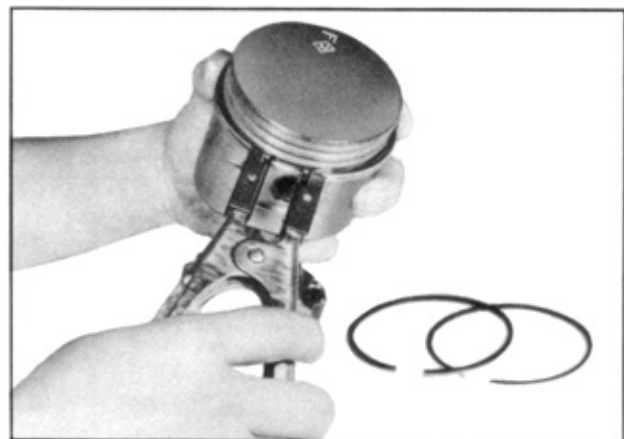
## *Piston Over Size*

Over Size	Part No.
S. T. D.	12012 18000
OS 0.25	12013 18000
OS 0.50	12014 18000
OS 0.75	12015 18000
OS 1.00	12016 18000
OS 1.25	12017 18000
OS 1.50	12018 18000

## Piston and Bores

Insert "Feeler gauge", 0.03 mm thick, between cylinder bore and piston, and measure at the lower portion of the cylinder bore at right angle to the piston pin.

Pull out with feeler gauge by the spring scale and then inspect if the reading is within regulations (0.5-1.5 kg) or not.



*Removing Piston Ring*

**Piston Rings**

The piston ring gap should be within 1.0 mm when checked in the cylinder bore. The clearance of the compression rings in their grooves should amount to 0.20 mm and the oil control ring 0.041-0.092 mm.



Because the piston rings do not travel to the end of the cylinder bores a "lip" is eventually formed due to wear.

This may be checked with a dial gauge and must be removed. If this is not done there will be a tendency to noisy operation or a fractured ring, caused by the top piston ring striking the lip.

unit: mm

		Standard accuracy	Clearance limit
Clearance between Groove & ring	Top	0.04 ~ 0.07	0.20
	Second	0.04 ~ 0.07	0.20
	Oil	0.04 ~ 0.08	0.20
Clearance between Pin hole & pin		0.003T 0.009L	0.02

*Clearance Between Ring and Groove*



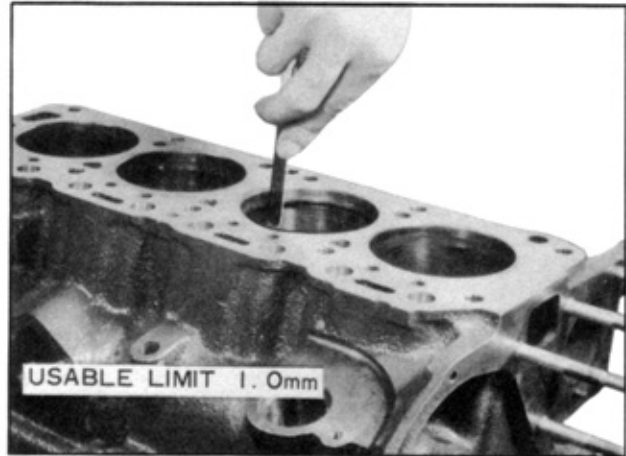
*Piston & Piston Ring*

- Compression rings --- side clearance ..... 0.04 - 0.07 mm
- Oil ring --- side clearance ..... 0.04 - 0.08 mm
- End gap of both compression and oil rings .... 0.2 - 0.3 mm
- Piston/piston pin --- press-fit  
(with set) ..... 1.0 - 1.5 t

O.S.	Set Piston with Piston pin	Upper	Piston Ring Lower	Oil
S.T.D.	12012-18000	12041-13200	12043-30000	12046-30800
O.S. - 0.25	12013-18000	12042-13200	12044-30000	12047-30801
O.S. - 0.50	12014-18000	12042-13201	12044-30001	12047-30802
O.S. - 0.75	12015-18000	12042-13202	12044-30002	12047-30803
O.S. - 1.00	12016-18000	12042-13203	12044-30003	12047-30804
O.S. - 1.25	12017-18000	12042-13204	12044-30004	12047-30805
O.S. - 1.50	12018-18000	12042-13205	12044-30005	12047-30806

## DATSUN 1000

Piston and rings are available in 0.25 mm, 0.50 mm, 0.75 mm, 1.00 mm and 1.50 mm oversizes. The piston rings should always be fitted from the crown of the piston and never pushed upwards over the skirt. Before fitting the rings, remove any carbon deposit from the grooves in the piston. When fitting, note that the second compression is tapered type and oil control ring is slat type processed by chromium plating.

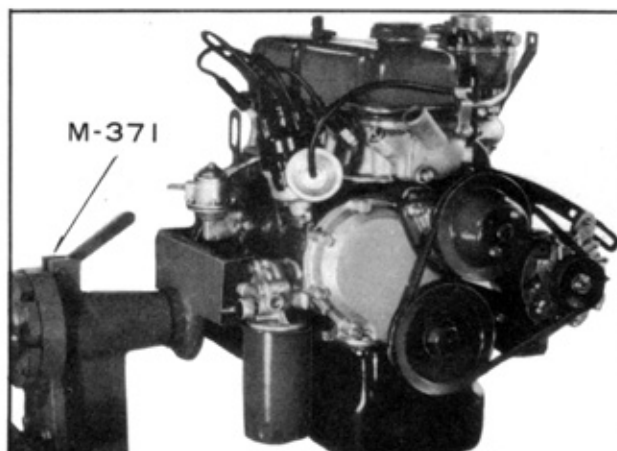


*Measuring Clearance of Ring Joint*

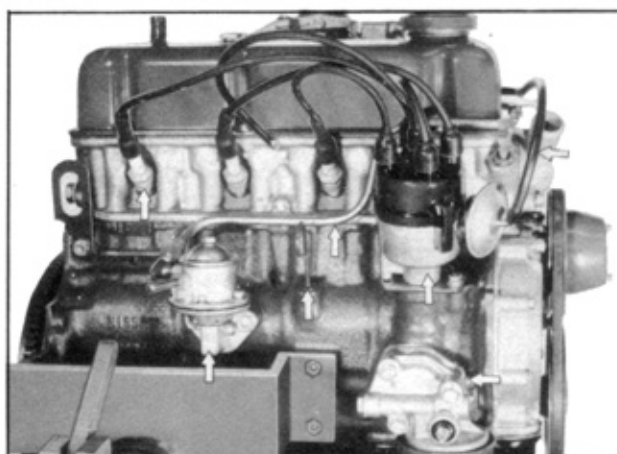


The following operations are best performed with the engine removed from the car.

Although it may be found possible to carry out certain attentions with the engine in position, it is more convenient to do the work on the bench.



*Removing Crank Gear, Cam Gear and Chain*



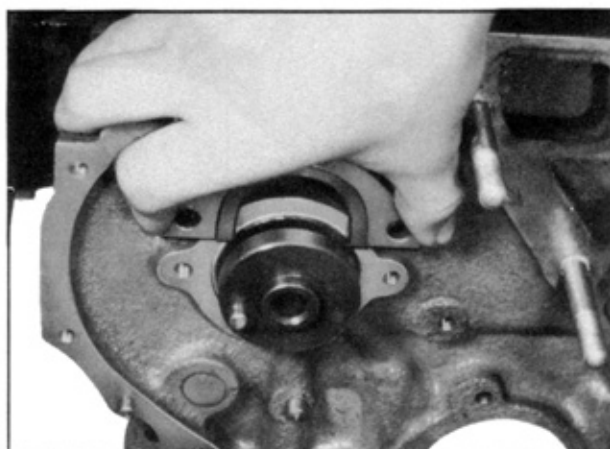
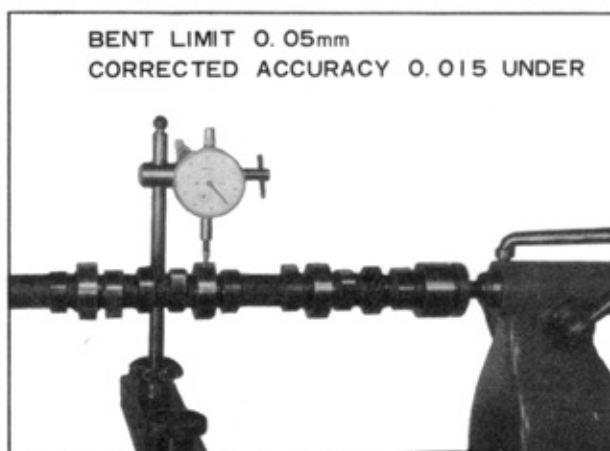
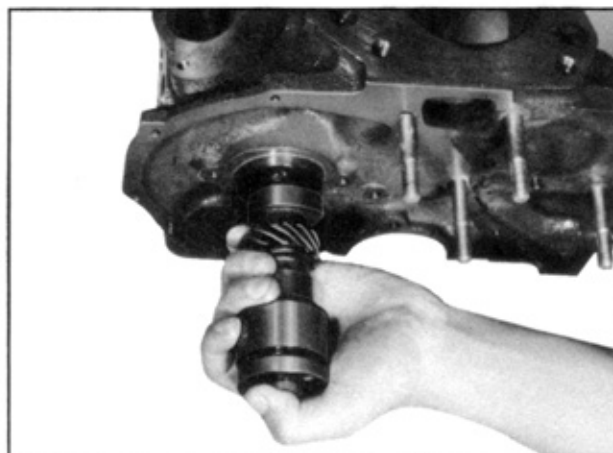
## Withdrawing Camshaft

The camshaft is positioned by a locating plate held by three screws and shakeproof washers. Note the position of the small lubricating oil hole in the locating plate when replacing should be to the right of the engine.

End play of 0.1 ~ 0.2 mm is controlled by the thickness of the locating plate, and can be checked with a dial indicator set against the camshaft gear.

Before withdrawing the camshaft, the distributor driving spindle will have to be removed.

Remove the valve lifter, the oil pump and its drive shaft. Take off the timing cover and gears.



Take out the setscrews securing the camshaft locating plate, when the camshaft can be withdrawn from the cylinder block.

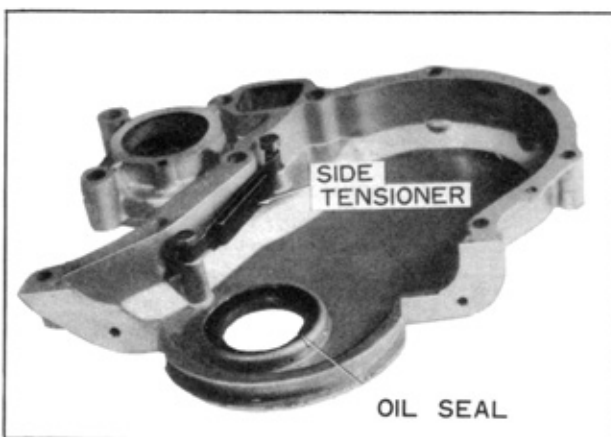
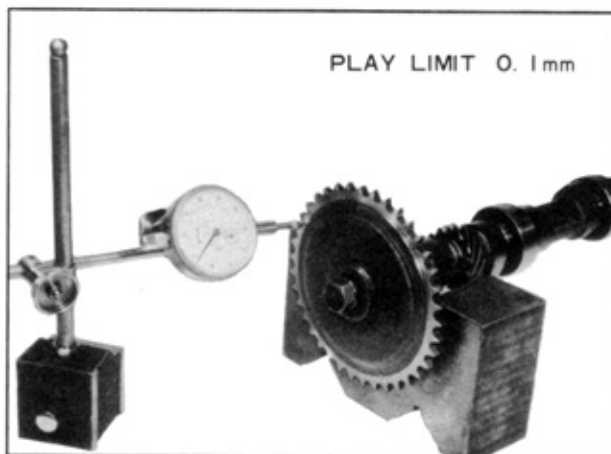
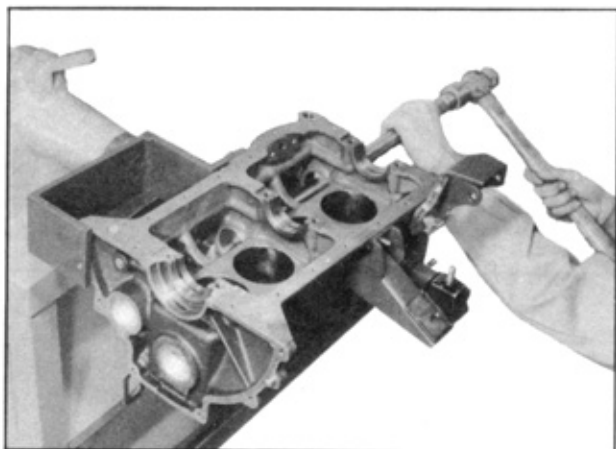


# DATSUN 1000

## Camshaft Bearings

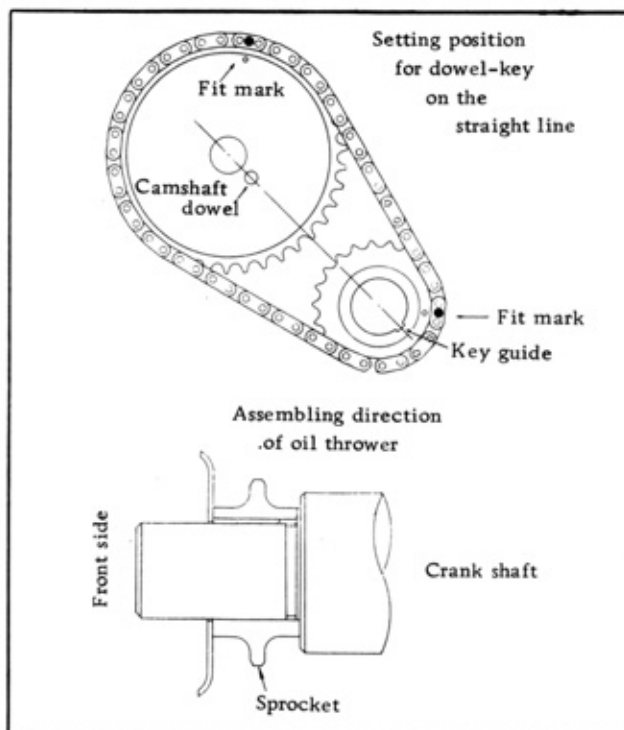
White metal bearings, with steel lining are used for the camshaft. They can be taken out renewed when necessary, it being usual to do this when the cylinder block is being reconditioned.

The bearings can be removed by drifting them out of their housings.



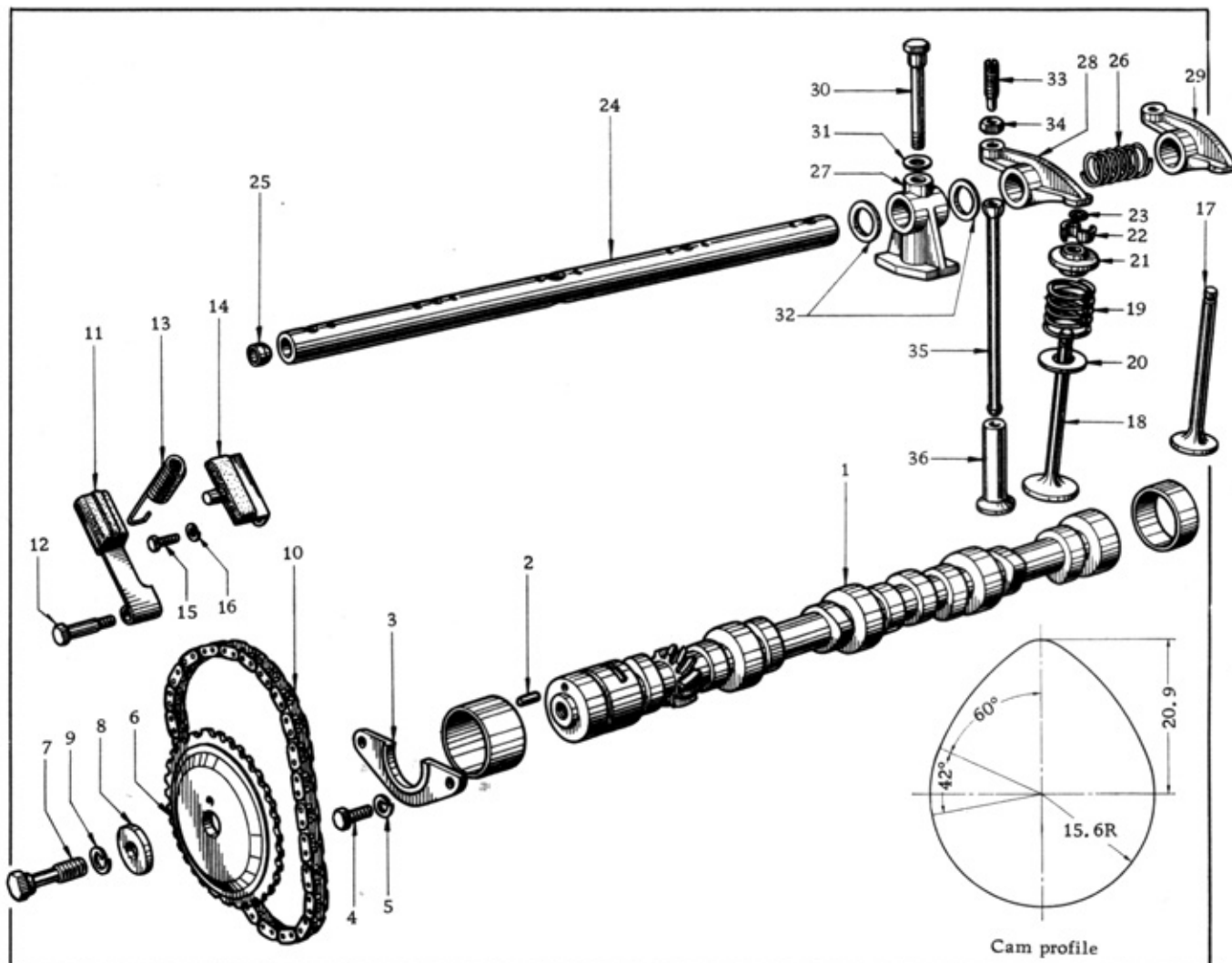
When fitting new bearings care must be taken to line up the oil holes with the corresponding holes in the cylinder block.

Tap the new bearings into position and ream them to give a running clearance of 0.1 ~ 0.2 mm.



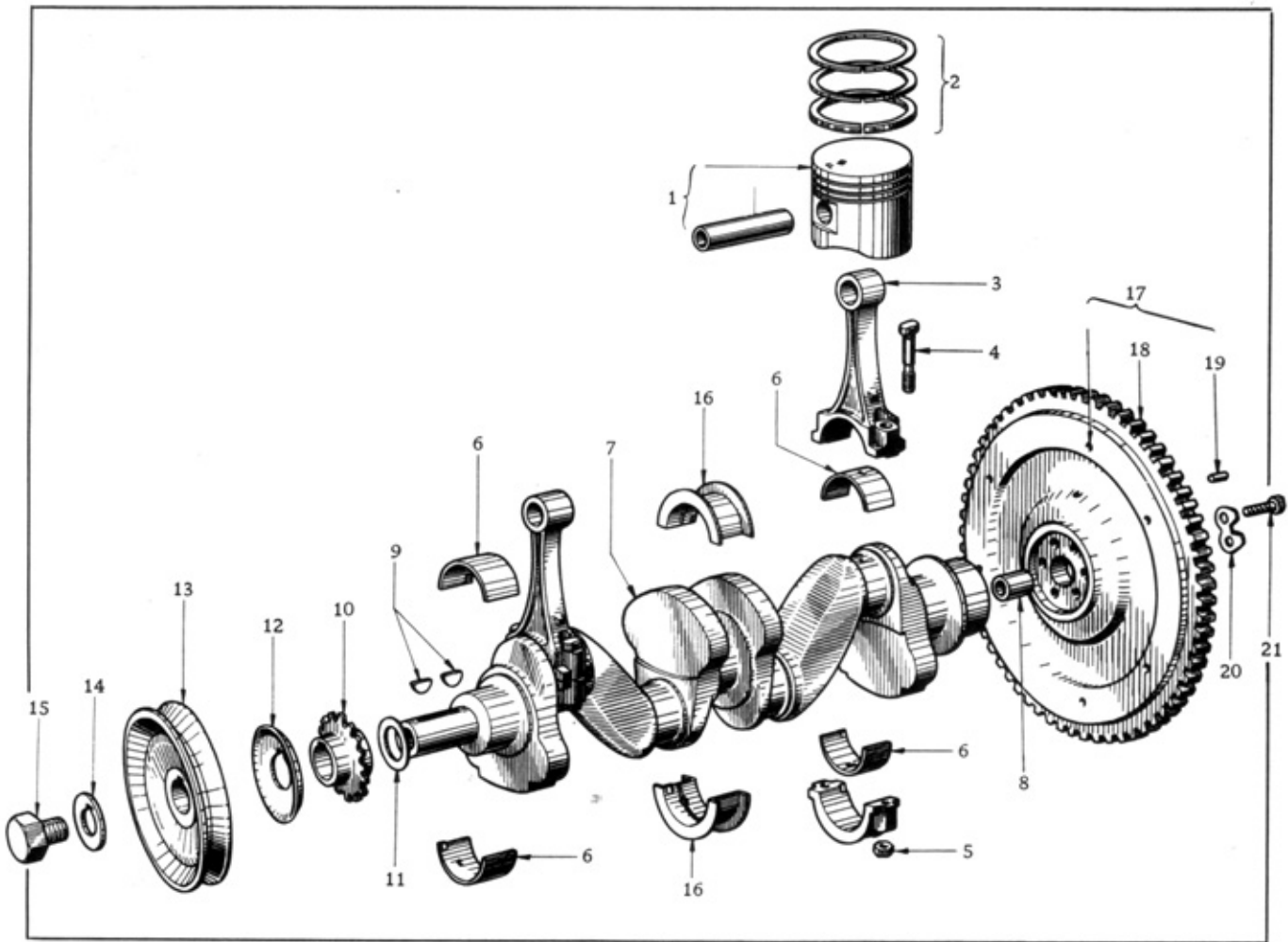
## Refitting the Camshaft

This is a reversal of the introductions for removal.



*Camshaft & Valve Mechanism*

1	Camshaft	13	Spring-chain tensioner	25	Plug-expansion, rocker shaft
2	Dowel-camshaft gear	14	Support-chain tensioner spring	26	Spring-inside, rocker shaft
3	Plate-camshaft	15	Bolt	27	Bracket-rocker shaft
4	Bolt	16	Washer-lock	28	Rocker-valve No. 1
5	Washer-lock	17	Valve-intake	29	Rocker-valve No. 2
6	Sprocket-camshaft	18	Valve-exhaust	30	Bolt-rocker shaft
7	Bolt-camshaft sprocket	19	Spring-valve	31	Washer-plain
8	Washer-camshaft	20	Seat-valve spring	32	Spacer-rocker valve
9	Washer-lock	21	Retainer-valve spring	33	Screw
10	Chain-camshaft	22	Collet-valve	34	Nut
11	Tensioner-chain	23	Seal-oil, valve	35	Rod-push
12	Bolt-chain tensioner	24	Ass'y-shaft, valve rocker	36	Lifter-valve



*Piston & Crank Shaft*

1	Set-piston, with piston pin	8	Bushing-pilot	15	Bolt-crank pulley
2	Set-ring, piston	9	Key-woodruff	16	Set-bushing, main bearing
3	Ass'y-rod, connecting	10	Sprocket-crank shaft	17	Ass'y-flywheel
4	Bolt-connecting rod	11	Washer-packing, crank shaft	18	Gear-ring, flywheel
5	Nut	12	Thrower-oil, crank shaft	19	Dowel-flywheel
6	Bushing-connecting rod	13	Pulley-crank shaft	20	Washer-flywheel
7	Ass'y-crank shaft	14	Washer-lock, pulley bolt	21	Bolt-flywheel

*CRANKSHAFT*

Wear limit at pin portion of	0.03 mm (elliptic or taper)
crank shaft journal	
Limit crank shaft alignment	Not to exceed 0.05 mm
Side clearance of crank shaft	Within 0.3 mm
Crank shaft journal oil clearance	0.02 ~ 0.06 mm
Portion of crank shaft thrust bushing	2nd side
Bushing over size of crank shaft journal	S. T. D. 0.25, 0.50, 0.75, 1.00
Dimension of crank shaft journal	49.951 ~ 49.964 mm
Dimension of crank shaft pin	44.961 ~ 44.974 mm

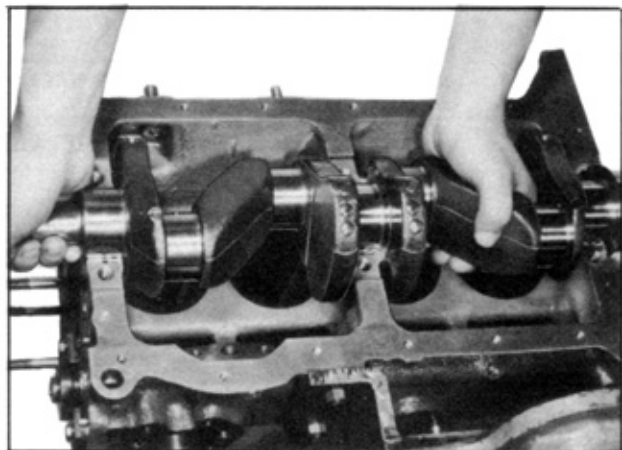
## Main Bearing Caps

Remove the flywheel and clutch.

Take off the timing chain, the sump and strainer, and the engine rear mounting plate. Unlock and remove the bolts securing the main bearing caps to the cylinder block, also the two bolts securing the front cap to the engine front bearer plate.

Note that a thrust washer is fitted on each side of the center main bearing to take the crankshaft end thrust. These thrust washers each consist of two semicircular valves, one half having a lug, which is located in a recess in the detachable half of the bearing, the other being plain.

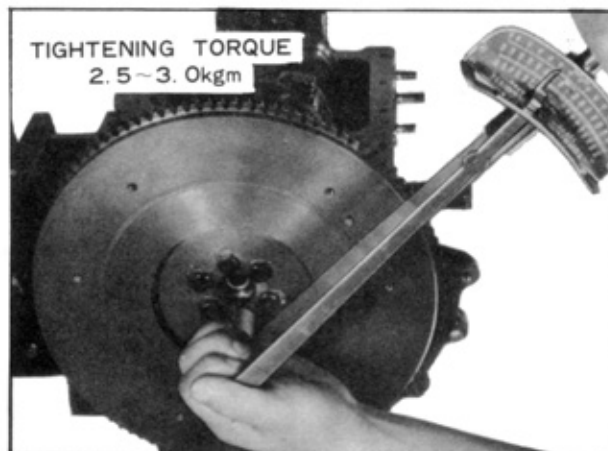
When fitting new bearings no scraping is required as they are machined to give the correct running clearance of 0.005-0.002 in. (0.0127-0.0508 mm).



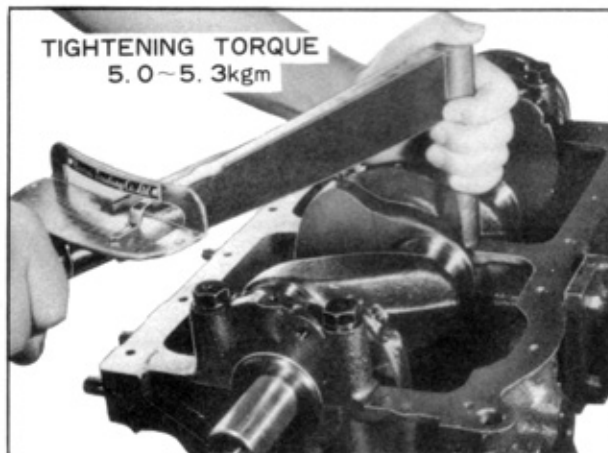
Ensure that the locating tangs are properly engaged in their recesses.

Handle the new bearings carefully so as not to damage the fine surface finish.

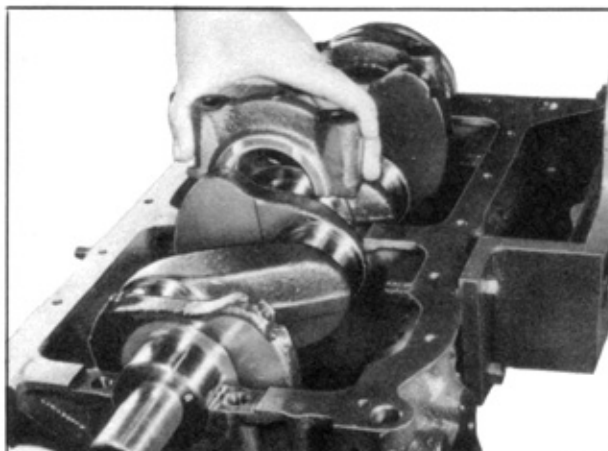
Remove all traces of dirt and oil from the housings and thoroughly dry them with a non-fluffy rag. Make sure that the oilways are clear. When fitting the bearing caps ensure that they are replaced the right-way round. Each cap is punch marked, and the marks should race the camshaft side of the engine.



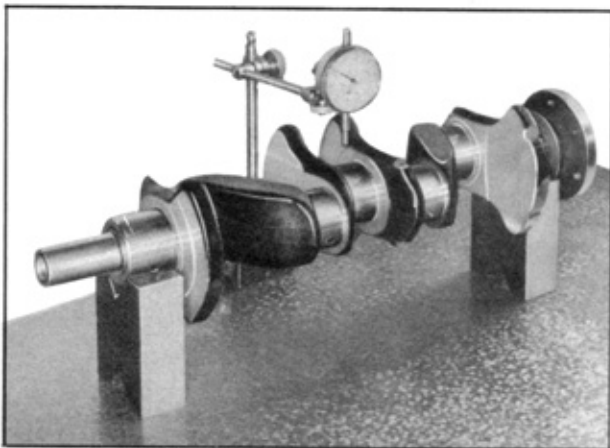
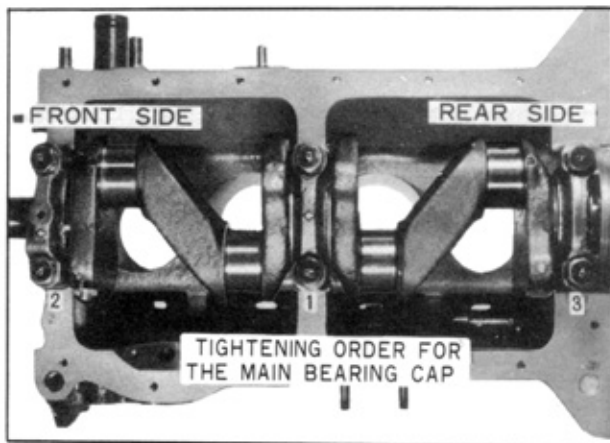
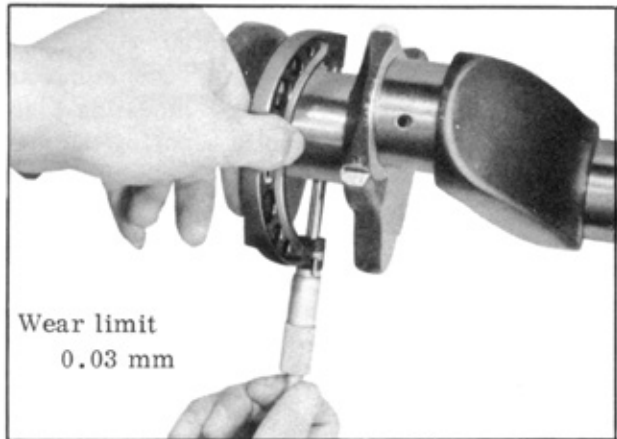
*Removing Flywheel*



*Main Bearing Cap*



*Removing Crankshaft*



*Accuracy to less than 0.015 mm  
correcting measuring bend of crank  
shaft allowable limit 0.05 mm*

### *Measuring Crankshaft Pin and Journal*

#### *Caution*

Never file the bearing caps to take up excessive play as this will cause ovality.

Always cover the bearing surfaces with engine oil when they are replaced.

The main bearing caps are held in position by setscrews and lock washers. Pull the setscrews up tight with a torque wrench set to a loading of 5.0 ~ 5.3 kg-m.

When refitting the main bearing caps tighten the center one first, after each cap is tighten rotate the crankshaft to ascertain that it revolves freely.

If it is tight remove the last cap tightened, and examine the bearing and its seating for foreign matter.

Check the crankshaft bent by means of a dial gauge. This should be within 0.05 mm.

If a bearing has "run", it is essential to clean out all oilways in the crankshaft and block. Wash out the engine sump and the strainer.

The oil pump should be dismantled and cleaned. Ensure that no particles of bearing, metal are left within the engine lubrication system.

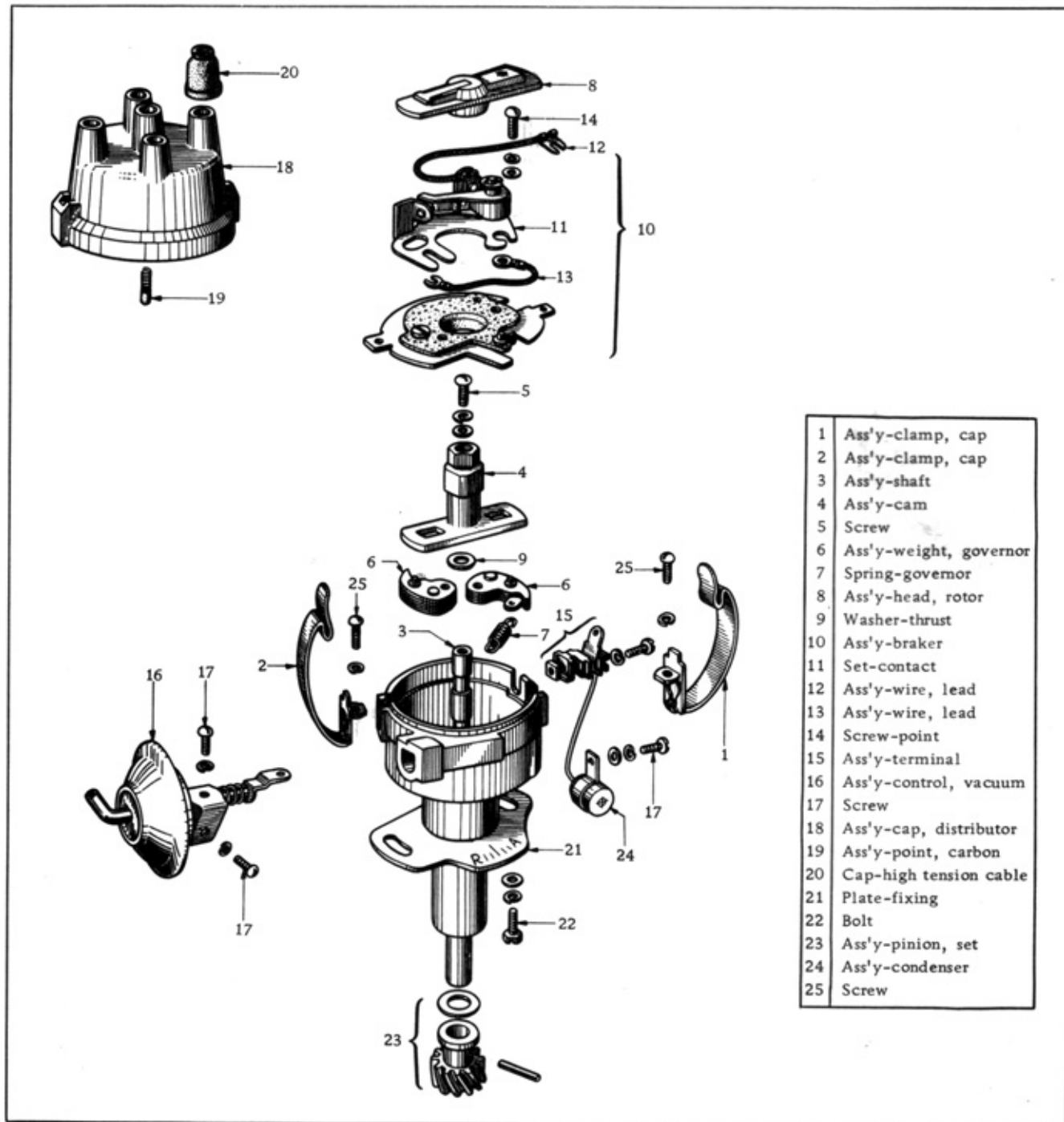


**DATSUN 1000**



IGNITION TIMING

DISTRIBUTOR



Distributor (Hitachi)



## DATSUN 1000

Inside the distributor is a breaker point as shown in Figure. This breaker makes and breaks contact several thousand times in one minute.

Each time this breaker makes contact, a spark is generated in one of the spark plugs. Therefore, the maintenance of this breaker must not be treated lightly. Also, because the time during which the ignition coil current flows varies with the gap between these breaker points, see that this gap is maintained at the standard value, which is 0.45 mm.

The breaker points must be kept free of grease and oil. If the points should become burnt or blackened, they are cleaned with a fine honing stone or crocus cloth after which they should be wiped clean with a piece of cloth which has been dampened with gasoline.

If the points are badly burnt, they must be replaced. Breaker points must always be replaced as sets.

### Adjusting the Breaker Points

To adjust the breaker points, turn the engine crankshaft with the crank handle until the breaker is fully open. Then loosen the breaker point fixing screw. Next, by turning the adjusting screw, move the plate until a feeler gauge of 0.45 to 0.55 mm (0.018 to 0.022 ins.) thickness slides easily between the breaker points. Then tighten the fixing screw securely.

Finally, check the gap once more; then reinstall the rotor. The interior and exterior of the cap is wiped clean with a soft, dry piece of cloth, extra attention being paid to the areas between the terminals. Clean the center

electrode on the inside of the cap also.

Whether or not the vacuum type timing advancer is functioning properly, can be determined by the inspection pointer located at the diaphragm if, as the engine is being run, this pointer moves when the engine speed is suddenly changed, the advancer is satisfactory.

### ADJUSTING THE IGNITION TIMING

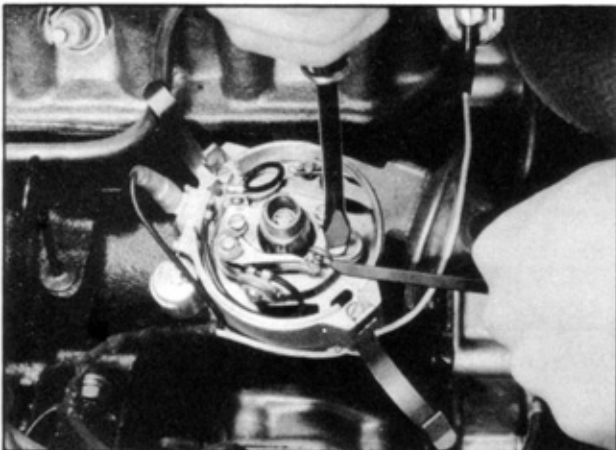
The ignition timing is adjusted to 10 degrees before top dead center with the engine stopped as shown in Figure. With this adjustment, the automatic timing advancer of the distributor advances the ignition timing even further at the time the engine starts to rotate, and the timing is maintained constantly at values suitable for the rotational speed.

With the engine stopped, adjust so that the distributor breaker point just breaks when the piston of the No. 1 cylinder is in its 8 degrees before top dead center position for compression. If a timing lamp is used, the standard ignition timing is 15 degrees before top dead center at idling (600 rpm.) speed.

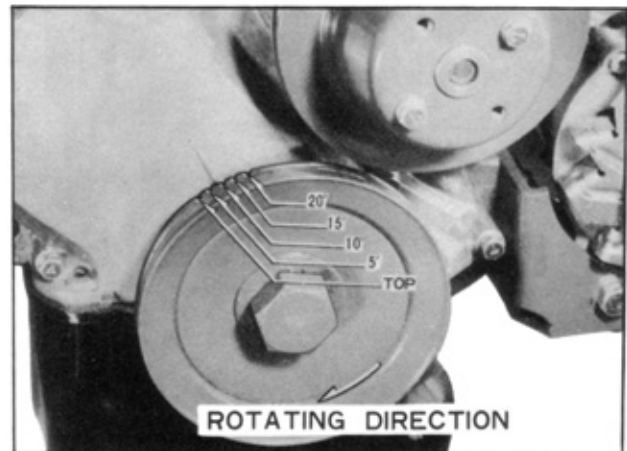
In the case of marks which are not evenly spaced, pointers indicate 10 deg., 15 deg. and 2- deg., positions before top dead center.

Adjustment is made by the following procedure.

1. First adjust the distributor to the correct gap as described previously.

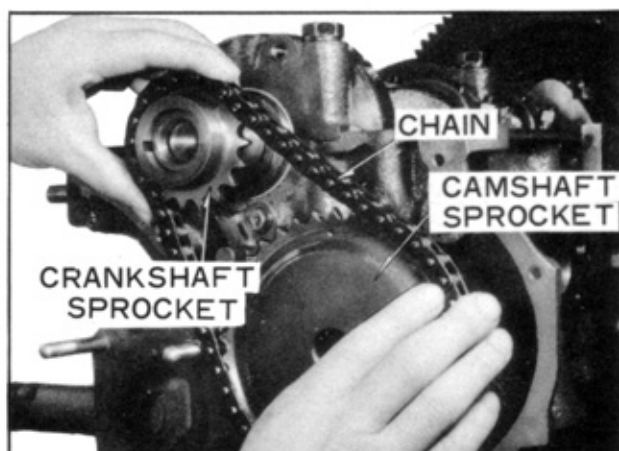


*Adjusting the Point Gap*



*Checking the Ignition Timing*

2. Turn the crankshaft gradually until the top dead center mark on the pulley periphery coincides with the mark for 10 degrees before top dead center on the timing gear cover as the crankshaft approaches its positions somewhat before that corresponding to the end of the compression stroke of the No. 1 piston. Stop the crankshaft in this position. The compression stroke of the No. 1 piston can be determined if the spark plug of the No. 1 cylinder is removed, the hole plugged with a finger, and the crankshaft turned. With the crankshaft in the previously-mentioned position, the No. 1 piston is in its position of 10 degrees before top dead center of compression.
  
3. Next, inserting the driving shaft of the distributor at an angle to the engine, engage the gear on its lower end and with the gear on the camshaft. During this assembly place the slot of the distributor drive of the upper end of the shaft somewhat to the left as shown in Figure. At this time, the smaller of the semicircle is placed toward the front.



*Setting of Timing Gear*

4. Adjusting the direction of the rotor so that it engages the drive shaft slot, mount the distributor to the engine. During this assembly the directions of the distributor and rotor must be as shown in Figure. At the same time, the breaker must be in its position when it is just beginning to open.

If these conditions do not coincide, they are made to do so by slightly turning the distributor body only.

To determine the position when the breaker point is just beginning to open, turn on the ignition key; hold the end of the No. 1 spark cord about 1/4 inch away from the cylinder head; and turn the body until spark jumps across the gap.

The off-set slot position of the drive shaft when the No. 1 piston is in its compression top dead center position is shown here.

5. Next put the distributor cap on and clamp it securely with the clip.
  
6. To the No. 1 spark plug connect the cord from the terminal to which the arm of the rotor is pointing. Thereafter connect the terminal cords to their spark plugs in the counter-clockwise order so as to obtain a 1-3-4-2 firing order.
  
7. Upon completion of the wiring, cover the distributor with a rubber cap. The engine should now start properly.

Ordinarily, the pointer of the octane selector is set at its zero reading during the ignition timing adjustment. If the octane number of the fuel being used is low and the engine knocks, the pointer is adjusted to the right (R) to the optimum advance angle.

Conversely, if the octane number is high the pointer is adjusted to the left (A). One unit of calibration of the selector corresponds to 2 degrees of the distributor angle and to 4 degrees of the crankshaft angle.

When a timing lamp is used, the standard setting is 15 degrees before top dead center with the engine idling (600-620). In any case, the optimum adjustment is that in which a slight knocking is heard when, with the car running at low speed in "HIGH" (TOP) gear, acceleration is applied suddenly.

## TROUBLES & REMEDIES

### Excessive Oil Consumption

#### Burning Oil

- (1) Rings not correctly seated to cylinder wall  
Give sufficient time for rings to seat  
Replace if necessary
- (2) Piston rings worn excessively or stuck in  
Replace ring
- (3) Excessive clearance between piston and  
cylinder wall due to wear or improper  
fitting  
Fit new pistons
- (4) Cylinder walls, scored, tapered or out of  
round  
Recondition cylinders and fit new  
pistons
- (5) Piston ring oil return holes clogged with  
carbon  
Replace rings
- (6) Piston ring broken  
Replace rings
- (7) Valve stem oil seals missing or leaking  
Replace seals, check for sealing

#### Leaking Oil

- (1) Rocker arm cover gasket or tightening  
tappet cover damaged or loose  
Tighten covers or replace gasket
- (2) Oil pan drain plug loose  
Tighten drain plug
- (3) Oil pan retainer bolts loose  
Tighten oil pan bolts
- (4) Oil pan gasket damaged  
Replace gasket
- (5) Timing cover loose or gasket damaged  
Tighten cover bolts or replace gasket
- (6) Fuel pump loose or gasket damaged  
Tighten fuel pump bolts or replace  
gasket
- (7) Rear main bearing leaking oil into clutch  
housing or flywheel housing  
Adjust or replace main bearing or  
main bearing oil seal

### Lack of Engine Power

#### Ignition System Improperly Adjusted

- (1) Spark plug faulty  
Replace or clean, adjust and seat spark  
plugs
- (2) Distributor points not set correctly  
Set distributor points and timing engine
- (3) Ignition not properly timed  
Set ignition by the instruction under  
correct specification of engine

#### Lack of Fuel

- (1) Gas line partly plugged  
Clean gas lines
- (2) Dirt or water in carburetor  
Clean carburetor and fuel pump
- (3) Dirt in gasoline tank  
Clean the tank
- (4) Air leaks in gasoline line  
Check gasoline lines and tighten
- (5) Fuel pump not functioning properly  
Replace or repair fuel pump

#### Carburetor Air Inlet Restricted

- (1) Air cleaner dirty  
Clean air cleaner
- (2) Carburetor choke partly closed  
Adjust or replace choke mechanism

#### Over Heat

- (1) Lack of water  
Refill system
- (2) Fan belt loose  
Adjust or replace
- (3) Fan belt worn or oil soaked  
Replace belt
- (4) Water pump inoperative  
Replace water pump
- (5) Thermostat sticking closed  
Replace thermostat

- (6) Cooling system clogged  
Clean and reverse flush
- (7) Incorrect ignition or valve timing  
Retime engine
- (8) Improper grade and viscosity oil being used  
Change to correct oil
- (9) Fuel mixture too lean  
Overhaul or adjust carburetor
- (10) Valve improperly adjusted  
Adjust valves
- (11) Exhaust system partly restricted  
Clean or replace

**Over Cooling**

- Thermostat holding open  
Replace thermostat

**Hard Starting****Slow cranking**

- (1) Heavy engine oil  
Change to lighter oil
- (2) Partially discharged battery  
Change battery
- (3) Faulty or undercapacity battery  
Replace battery
- (4) Poor battery connections  
Clean and tighten or replace connections
- (5) Faulty starter switch  
Replace switch
- (6) Faulty starting motor or starting switch

**Ignition Troubles**

- (1) Distributor points burned or corroded  
Clean or replace points
- (2) Points improperly adjusted  
Readjust points correctly
- (3) Spark plugs improperly gapped  
Set plug gap correctly  
0.7 ~ 0.8 mm (0.0275 ~ 0.0315 in.)

- (4) Spark plug codes loose and corroded in distributor cap  
Clean code and cap terminals
- (5) Loose connections in primary circuit  
Tighten all connections in primary circuit
- (6) Series resistance in condenser circuit  
Clean all connections in condenser circuit
- (7) Low capacity condenser  
Install proper condenser

**Engine Condition**

- (1) Valves burned  
Grind valves or change
- (2) Valves holding open  
Adjust valves
- (3) Leaking manifold gasket  
Tighten manifold bolts or replace gasket
- (4) Loose carburetor mounting  
Tighten carburetor mounting bolts
- (5) Faulty pistons, rings or cylinders  
See "Lack of power"

**Carburetion**

- (1) Choke not working properly  
Adjust or repair choke mechanism
- (2) Throttle not set properly  
Set throttle
- (3) Carburetor dirty and passages restricted  
Overhaul carburetor

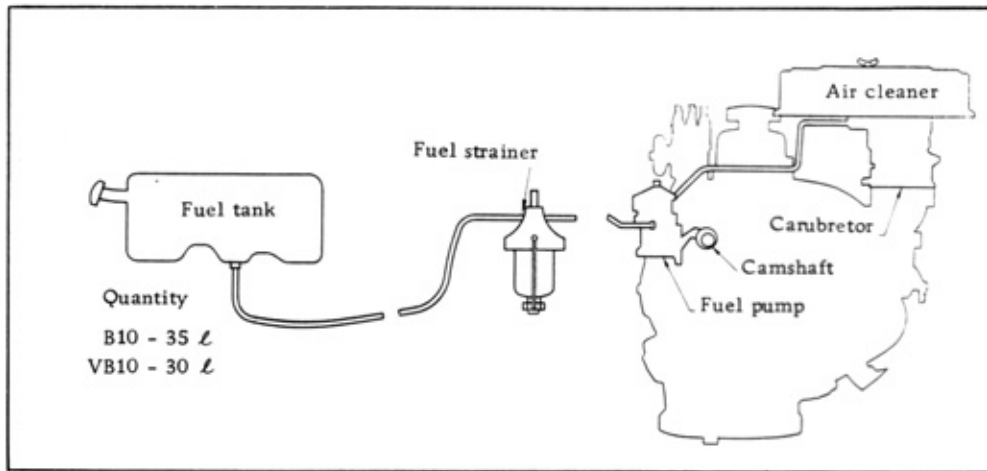
**Spitting and Detonation****Ignition trouble**

- (1) Loose wiring connections  
Tighten all code connections
- (2) Faulty wiring  
Replace faulty wiring
- (3) Faulty spark plugs  
Clean or replace and adjust plug gap

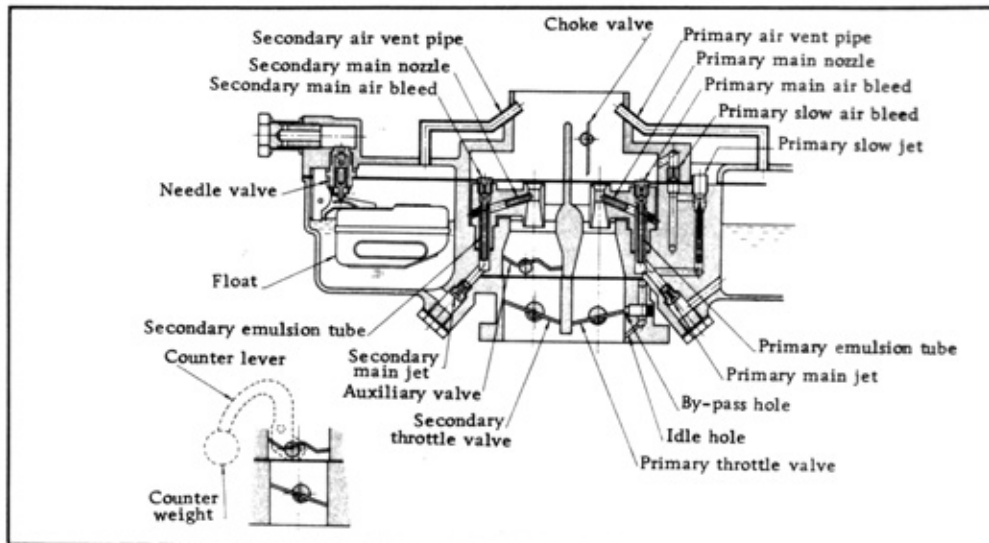
**DATSUN 1000**



FUEL SYSTEM



CARBURETOR



Model	Hitachi DCG 286-3	
Type	Down draft, 2 barrel	
	Primary	Secondary
Throttle valve bore	26 mm	28 mm
Venturi size	20 x 7 mm	24 x 7 mm
Main jet	# 95	#140 (160)
Main air bleed	# 80	#120
Slow jet	# 40	
Slow air bleed	#210 (220)	
Power jet		# 60
Needle valve dia.	1.5 mm	
Float level	18 ± 1 mm Fuel pressure 0.16 kg/cm <sup>2</sup>	

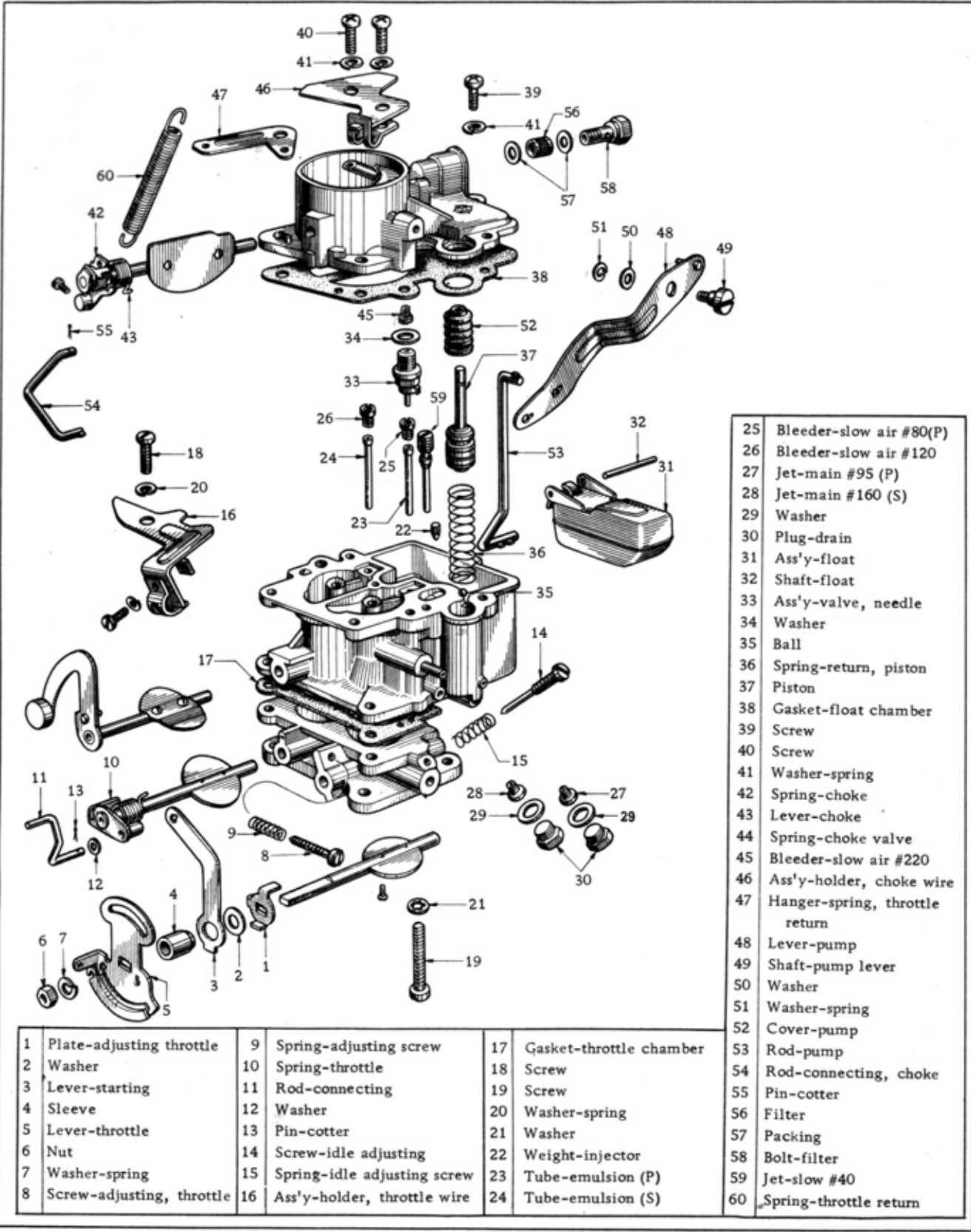
The secondary throttle valve is open to begin when the primary throttle valve is open at 48 degrees.

Constructure

The carburetor has the function of atomizing the fuel, mixing it in suitable ratio to air and supplying the mixture to the engine.

It is therefore an important part which can influence the performance of the engine.

The carburetor is a highly efficient one of two barrel two step and down draft type having the following special features.

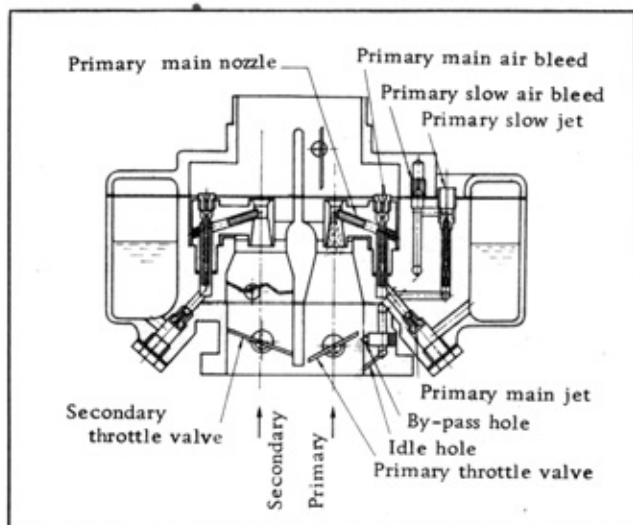


- 25 Bleeder-slow air #80(P)
- 26 Bleeder-slow air #120
- 27 Jet-main #95 (P)
- 28 Jet-main #160 (S)
- 29 Washer
- 30 Plug-drain
- 31 Ass'y-float
- 32 Shaft-float
- 33 Ass'y-valve, needle
- 34 Washer
- 35 Ball
- 36 Spring-return, piston
- 37 Piston
- 38 Gasket-float chamber
- 39 Screw
- 40 Screw
- 41 Washer-spring
- 42 Spring-choke
- 43 Lever-choke
- 44 Spring-choke valve
- 45 Bleeder-slow air #220
- 46 Ass'y-holder, choke wire
- 47 Hanger-spring, throttle return
- 48 Lever-pump
- 49 Shaft-pump lever
- 50 Washer
- 51 Washer-spring
- 52 Cover-pump
- 53 Rod-pump
- 54 Rod-connecting, choke
- 55 Pin-cotter
- 56 Filter
- 57 Packing
- 58 Bolt-nut
- 59 Jet-slow #40
- 60 Spring-throttle return

1	Plate-adjusting throttle	9	Spring-adjusting screw	17	Gasket-throttle chamber
2	Washer	10	Spring-throttle	18	Screw
3	Lever-starting	11	Rod-connecting	19	Screw
4	Sleeve	12	Washer	20	Washer-spring
5	Lever-throttle	13	Pin-cotter	21	Washer
6	Nut	14	Screw-idle adjusting	22	Weight-injector
7	Washer-spring	15	Spring-idle adjusting screw	23	Tube-emulsion (P)
8	Screw-adjusting, throttle	16	Ass'y-holder, throttle wire	24	Tube-emulsion (S)

Carburetor (Hitachi)

## Main Carburetting System (Primary)



*Partially Loading*

The fuel flowing out of the passage at the bottom of the float chamber passes through the primary main jet and then mixed with the air coming from the main air bleed to be minute drops and inject into the venturi through the main nozzle.

When the throttle valve is widely open and the engine requires dense mixture gas, the accelerating pump opens its power valve, from where the fuel also flows into the main system.

The power valve begins to operate when the throttle valve opens 48 degrees from full closed position.

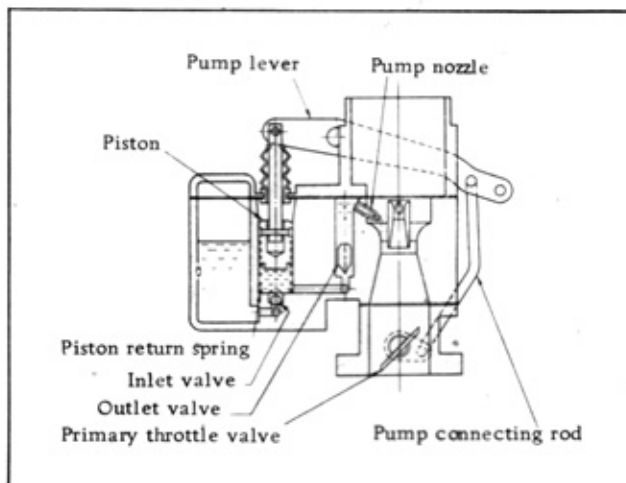
### Slow Speed System

Passing through the main jet, the fuel passage separate from main line and flows through the slow jet, slow air bleed first, slow economizer, slow air bleed second and inject from the by-pass holes and idle holes.

### Accelerating System

Mechanical accelerating pump synchronized with the throttle valve is adapted. When throttle valve is closed, the piston rod is pushed up with the linkage, which pushed up the piston through the dumper spring. When the piston is coming down, the inlet check valve closes the outlet check valve opens and the fuel within the pump is blown out from the pump jet by the compressed dumper spring and hits against the side wall

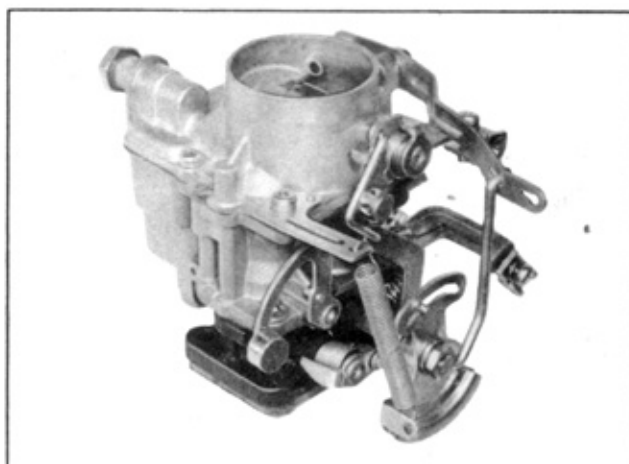
of the small venturi to be minute drops, compensating transient sparseness of the fuel. A jetting amount of the fuel can be varied with the two holes provided on the pump arm, that is, the inserting positions of the connecting rod.



*At Accelerating*

### Starting System

The choke valve is provided with the spring and installed eccentrically on the normal carburetting device and synchronized with the throttle valve. When the choke is fully closed, the throttle valve opens about 14 degrees from a full close. This is the best condition to start operation. The synchronization of the choke valve and the throttle valve can be exactly maintained often the engine has started firing.

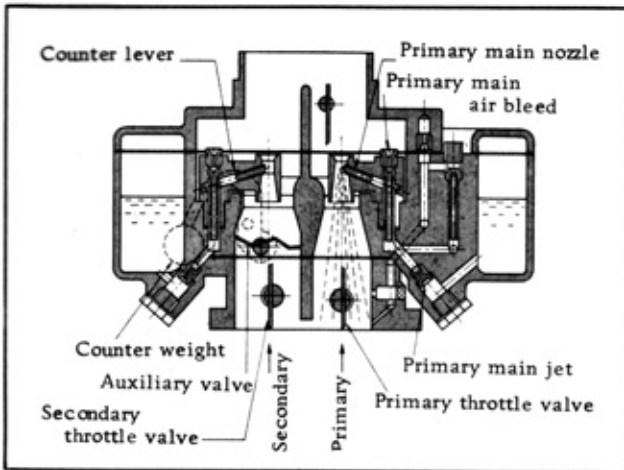




# DATSUN 1000

## Main Carburetting System (Secondary)

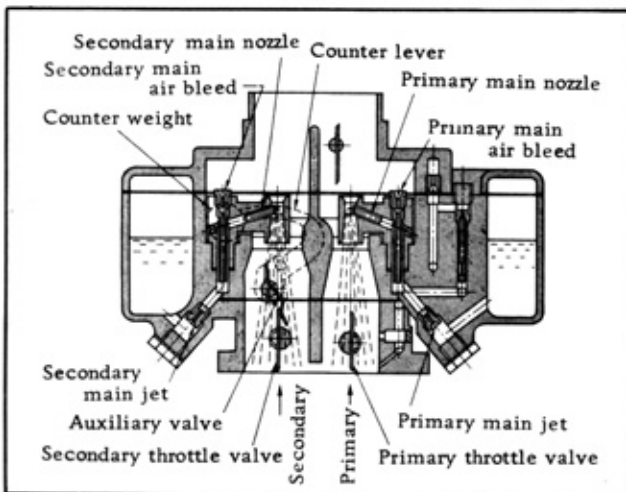
Same as the normal carburetting function the fuel flowing out of the passage at the bottom of the float chamber passes through the secondary main jet and become minute drops mixing with the air coming from the main air bleed and is blown into the venturi through the main nozzle.



*At Full Open, Slow Speed*

When the throttle valve of the normal carburetor is widely opened and the engine produces high power, the throttle valve of the power carburetor begins to open by the sun-synchronized linkage.

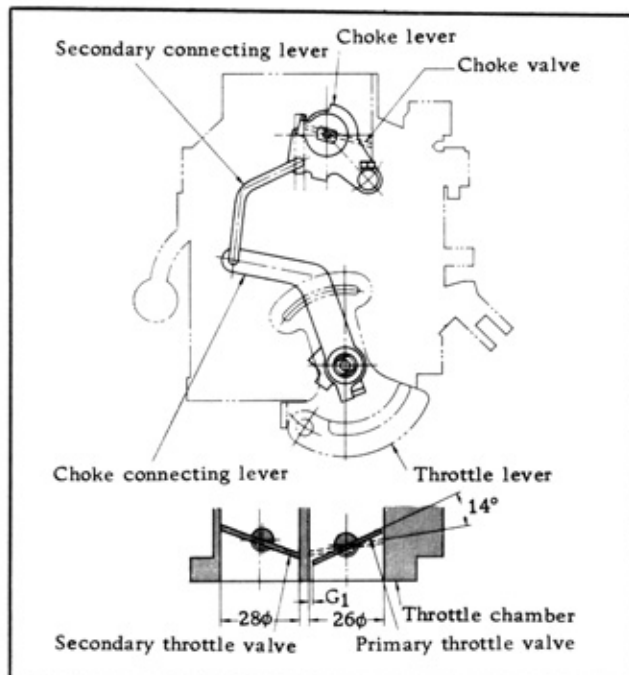
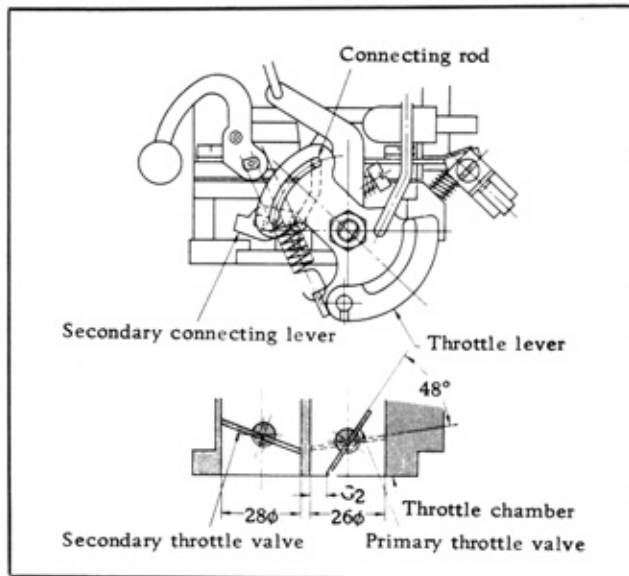
However, at the top of the power carburetor throttle valve is an auxiliary valve which is not open at a slow speed with a heavy load due to the load of the counter weight connected to the valve shaft even when the throttle valve is open.



*At Full Open, High Speed*

When the engine change to still higher revolutions, the auxiliary valve open against the load of the counter weight and the power carburetor starts operation for high power. When the normal carburetor throttle valve is in a full open, the power carburetor throttle valve is also to be in a full open.

## Adjustment for Connection of Primary and Secondary Valves



*Opening Degree to Begin Starting*

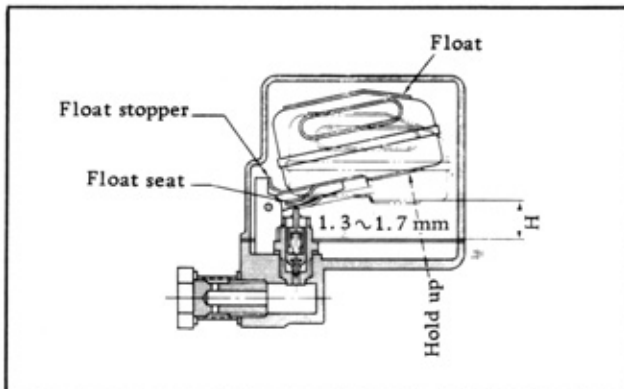
## Float Chamber

Adjustment of the float level can be done from outside by adding or subtracting the needle valve carrier gasket after removing the float needle valve installed at the inlet connector.

As ventilation within the float chamber is of a air vent method and pressure within the venturi and the float chamber is always constant no matter how suctional resistance of the air cleaner varies, fuel consumption can be always economically maintained.

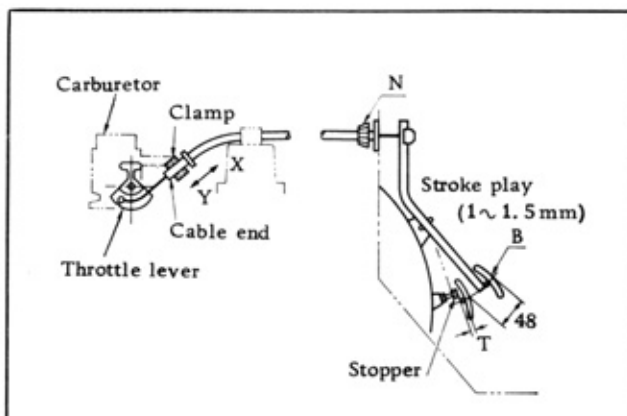
## Adjusting Fuel Level

At the stage, the float upper surface must be level and parallel with the chamber top. (Dimension 10.5 mm height) Adjust by bending the float seat.



*Adjusting the Float Level is Done*

## Adjusting of Accelerator Pedal



The accelerator must be so adjusted by the adjusting plate at the carburetor side that the throttle valve may be full open with full pedal on and of slight gap with pedal off. After adjusting this, tighten up surely the nuts of the adjusting plate.

## THE GASOLINE TANK

The fuel tank has a capacity of 41.0 liters and is situated at the rear of the luggage compartment.

The fuel pump, operated off the camshaft draws fuel from the tank and forces it into the carburetor float chamber. A large and efficient air cleaner filters the air supply to the carburetor.

## Draining the Fuel

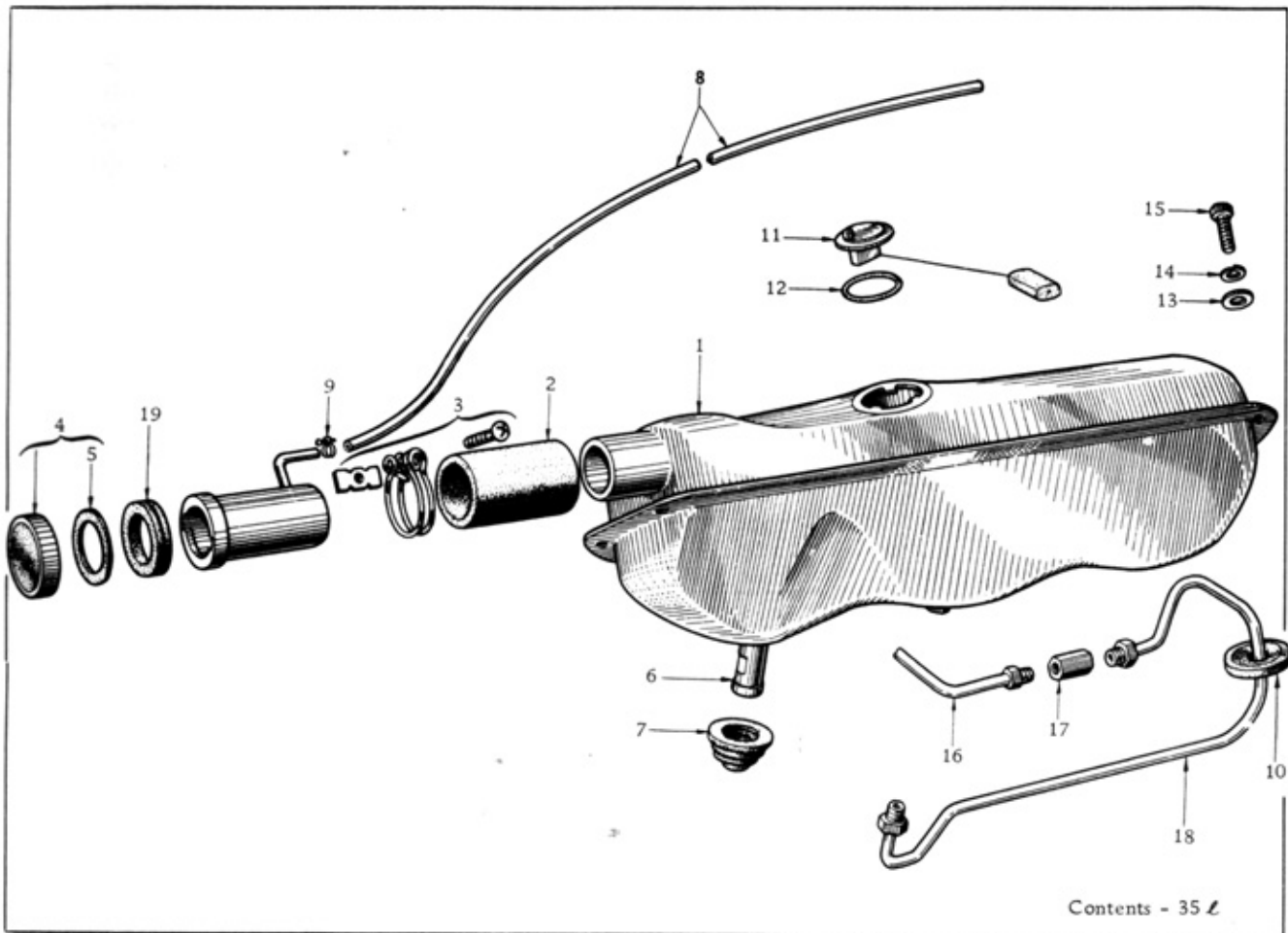
The fuel tank is drained by turning the wrench operated drain cock.

## Fuel Tank Gauge Unit

Situated on the top face of the tank is the gauge unit. To remove, withdraw the set screws which secure the unit to the tank not forgetting to disconnect the electrical lead beforehand. Care must be taken not to strain or bend the float lever as this may seriously effect subsequent gauge readings. Remember this also applies when refitting the unit.

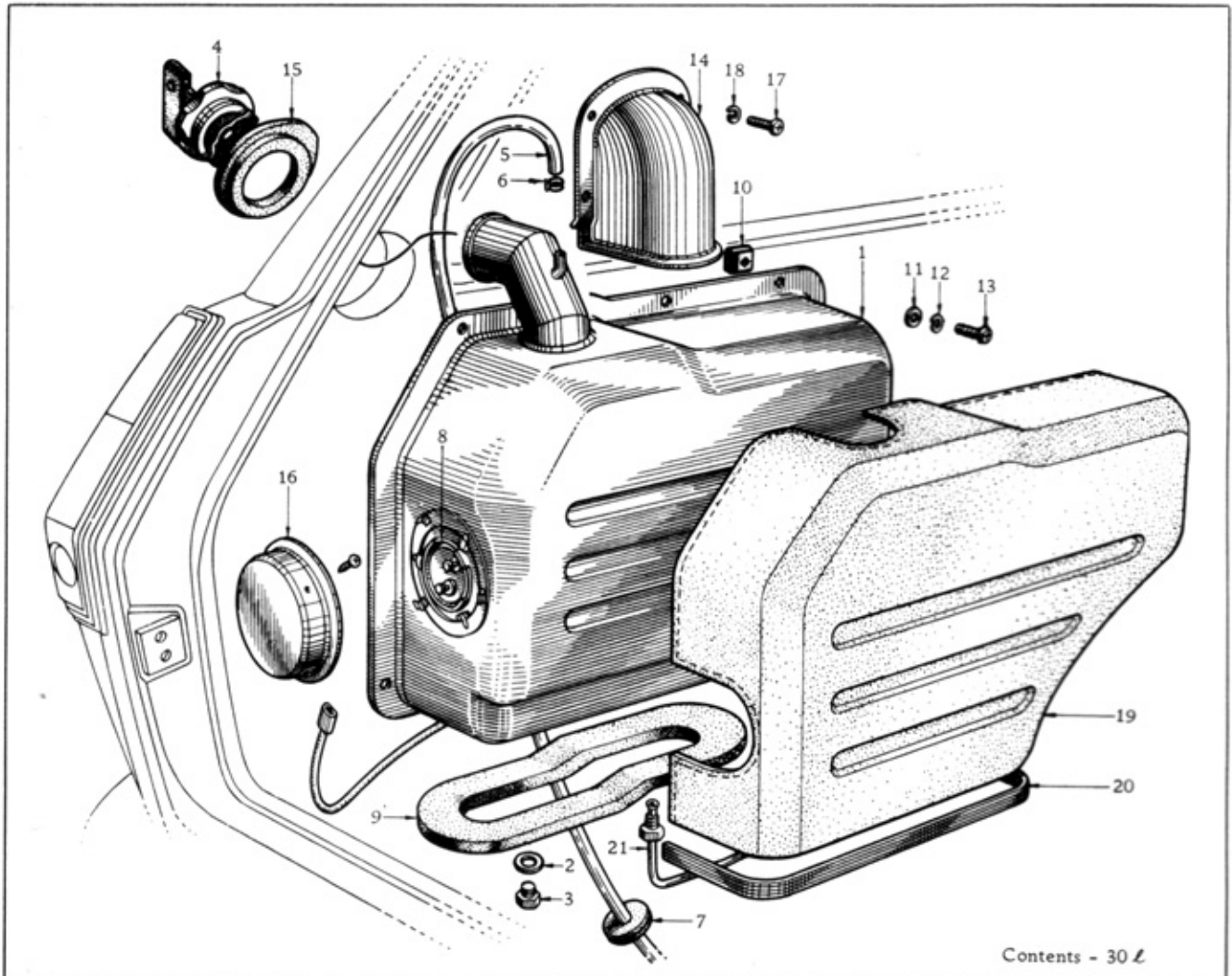
Examine the joint washer to ensure that it is in position and undamaged. This is essential as the joint between the tank and gauge unit must be fuel tight.

# DATSUN 1000



*Fuel Tank (Sedan)*

1	Ass'y-tank, fuel	11	Unit-gauge, fuel tank
2	Hose-filler tube	12	Ring-"O", fuel gauge unit
3	Clamp-hose	13	Washer-plain
4	Ass'y-cap, filler	14	Washer-lock
5	Packing-filler cap	15	Screw
6	Ass'y-tube, drain	16	Ass'y-tube, fuel tank to fuel strainer
7	Grommet-rubber	17	Connector-fuel tube
8	Tube-breather	18	Ass'y-tube, fuel tank to connector
9	Clamp-hose	19	Grommet-fuel tank tube
10	Grommet		



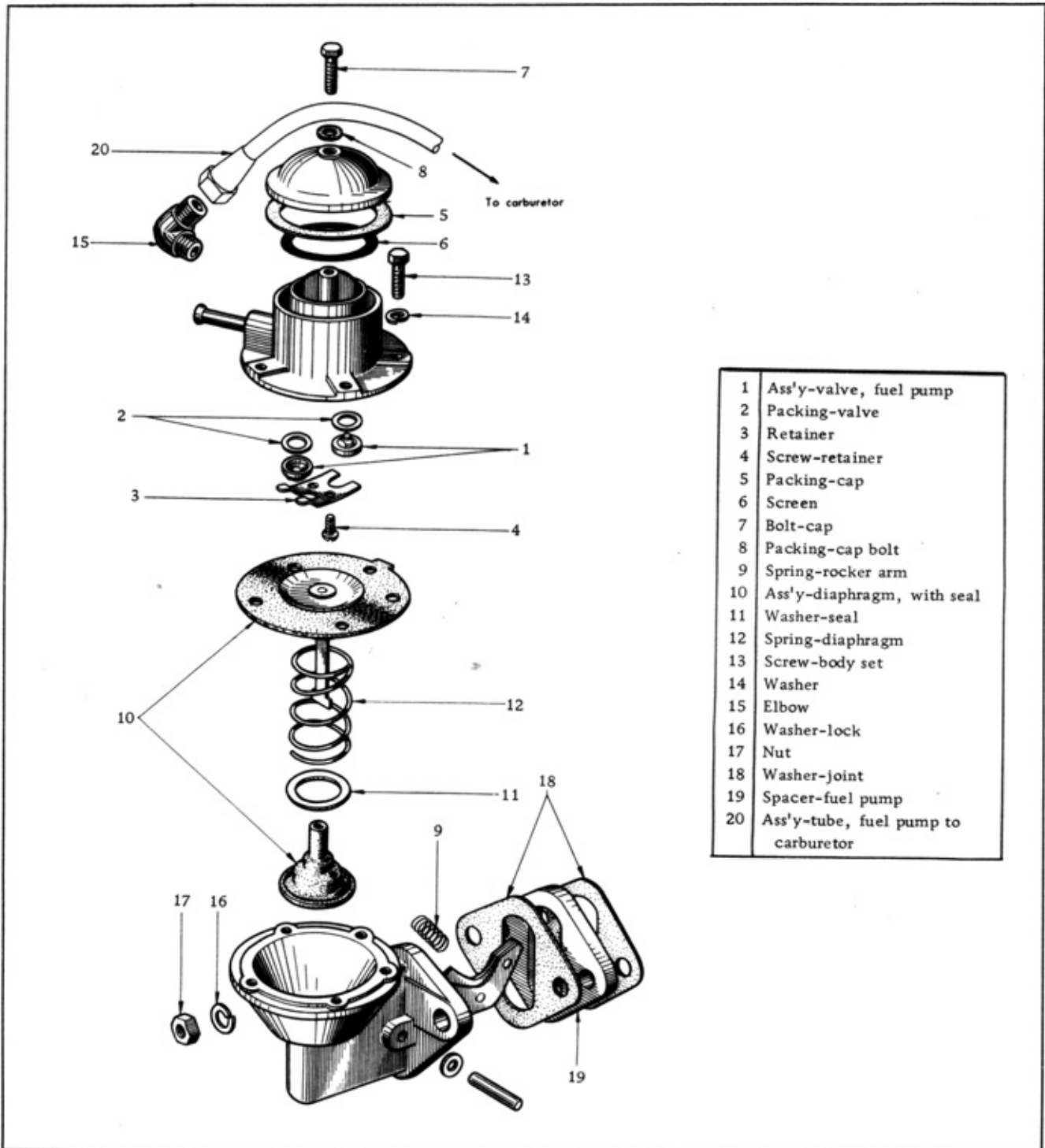
Contents - 30 L

*Fuel Tank (Van)*

1	Ass'y-tank, fuel	12	Washer-lock
2	Washer-drain plug	13	Screw
3	Plug-drain	14	Cover-fuel filler neck
4	Ass'y-cap, filler, fuel tank	15	Grommet
5	Tube-breather	16	Cover-fuel gauge
6	Clamp-hose	17	Screw
7	Grommet	18	Washer-plain
8	Unit-gauge, fuel tank	19	Cover-fuel tank
9	Packing-fuel tank	20	Welt-rear floor
10	Seat-fuel tank mounting	21	Ass'y-tube, fuel tank to strainer
11	Washer-plain		

# DATSUN 1000

## FUEL PUMP



*Fuel Pump*

Cam r.p.m.	Outlet Pressure mm-Hg	Outlet Quantity cc/min.
300	130	450
1,000	130	450
3,000	130	750

## Disassembly

- 1) Disconnect the tube.
- 2) Take off the attached bolts of body.
- 3) Mark on the edge of body for preparation of assembly again.
- 4) Detach the cap, packing and screen.
- 5) Separate the upper and lower body.
- 6) Take out the two valves from the upper body.
- 7) Hook out the diaphragm with the seal from the rocker arm. (Turn it about 90 degrees horizontal way.)
- 8) Pull out the pin to separate the rocker arm the assembling of components is the reversal procedure in this order.

The fuel pump, which is of the diaphragm type, is mechanically driven by the eccentric part of the camshaft of the engine.

It draws gasoline from the tank and delivers it under pressure to the carburetor.

By the rotation of camshaft, rocker arm is pushed and pull rod of diaphragm is pulled down.

At the same time, diaphragm goes down against diaphragm spring and then is pushed up again by its spring.

By the movements of the diaphragm and functioning of the valves at the inlet and outlet of the pump chamber, gasoline is drawn up from the tank to the carburetor.

If the float chamber of the carburetor contains enough gasoline and the needle valve is closed, gasoline is not allowed into the carburetor.

Thus gasoline is stored in the pump chamber and due to its pressure, the diaphragm is kept down and cannot return.

Under this condition, the rocker arm works in vain, as the rod remains low.

The rocker arm spring serves to prevent noise, keeping the rocker arm pushed against the eccentric of the camshaft.

## Disassembling & Inspection

### *Checking with Fuel Pump Installed on Engine:*

Switch off and stop the engine. Disconnect the fuel pipe at the inlet union of the carburetor, and then turn the engine with the crank handle.

Now the gasoline should be ejected vigorously from the tip of the pipe once every two rotations of the crankshaft.

### *Removal from Engine:*

Fuel pump can be easily removed by disconnecting the inlet and outlet unions and loosening the 2 attachment nuts.

### *Inspection Prior to Disassembling:*

Prior to disassembling of the removed pump, measure the distance between the rocker arm and flange of the lower body by means of a scale and see if the rocker arm, rocker link and pins are worn.

### *Method of Disassembling:*

First wipe dirt off the outer surface of the pump and put marks on both the upper and lower bodies, to make their reassembling easy.

It is easily separated into two when the five screws around the upper body are loosened.

Take great care not to damage the diaphragm during this disassembly.

## Checking & Repaires of Parts

- Wash the disassembled parts well in gasoline then inspect them.
- Replace the diaphragm if any damage, impregnation by gasoline.
- Replace a valve assembly if any wear or faulty operation is detected.
- The rocker arm should be replace when its contact face with the cam and that with the link and its pin hole are seriously worn.

## DATSUN 1000

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- Renew the arm pin when it is found worn excessively.
- The diaphragm spring, arm spring seldom become faulty, but when weakened, replace them always with standard ones.
- If the diaphragm spring is too strong, it results in overflow of the float chamber of the carburetor.
- The tension of the spring must not be strengthened or weakened arbitrarily by hand.
- Check to see if there is any warp on the joint surfaces of the cap and body, and, after disassembling is over, renew the gasket to keep its air-tightness.

### Reassembling & Installing

- Employ standard springs for the various uses as stated before.
- Install valves precisely for close contact with their respective seats.
- In screwing in of upper and lower bodies and diaphragm, fit them together according to the marks which were put before the disassembling and align one screwing hole to its mate, and then screw in at the position where the diaphragm is fully pulled down with the rocker arm pushed towards the side of the body by hand pressure.
- Do not screw in tight one by one since it causes warping. Instead, clamp all the screws round loosely and uniformly. Then tighten them diagonally and lastly retighten all of them in order to make sure.
- As a general rule, gaskets should be replaced by new one.

Installation on the engine is done in the reverse order to that for disassembly.

Be sure to set the rocker arm so that it is contacting the eccentric of camshaft properly, not the rear side or to one side. Replace the gasket between the cylinder block and pump with a new, standard one.

### Checking Function

When repairs of the pump is over, or before

it is installed on the engine, make a check to inspect.

When a vacuum gauge is connected to the pump inlet port and the pump is mounted on a tester, the rocker arm is activated by the eccentric of the camshaft revolving at 1,000 rpm. Then the gauge pressure should rise to higher than 400 mm of mercury column, and, even if operation is discontinued, this condition should remain for more than 3 seconds.

When a gauge or tester is not available, test in the following way:

Close the inlet port and outlet port with finger tips. Then, after operating the rocker arm several times, suddenly release the fingers.

The pump is in good conditions if 3 to 5 seconds thence, there can be heard strong inlet and outlet noise respectively.

The pump is mechanically fit for use when, by connecting a hose to the inlet port, it is able to draw up gasoline from a height of more than 0.5 m. After installing the pump, test its functions during operation.

- (A) Connect the gasoline pipe on the inlet port side only. Leave that on the outlet port side as it is, and turn the engine 6 to 7 rotations by means of the crank handle and make sure that there is sure outflow of gasoline from the outlet port.
- (B) Connect the gasoline pipe to the outlet port side and tighten all the piping joints. Then turn the engine again several times to see if there is any leakage of air or gasoline from each connection.

## ADJUSTMENT AND INSPECTION OF ENGINE

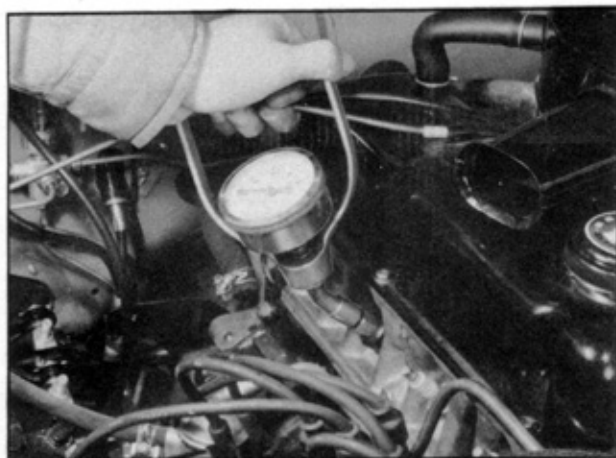
The engine must always be operated in the best possible condition, and for this purpose, periodic inspection and adjustment must be maintained in a certain order while in use as well as after overhaul.

### Order of Inspection and Adjustment of Engine

- (1) Check the cooling water: water level and extent of fillthiness.

- (2) Inspect the battery: all connections, level of electrolyte, specific gravity of electrolyte and voltage.
- (3) Inspect the oil: amount, filthiness, classification and viscosity.
- (4) Cleaning of spark plugs and adjustment of their gaps.
- (5) Measurement of compression pressure of cylinder. The standard compression pressure of the engine is approximately 12.0/350 kg/cm<sup>2</sup> (r.p.m.). Measurement of pressure is made in the following manner:

First, warm up the engine (temperature of cooling water, 70°-80° C) then remove all spark plugs and pull out the throttle knob all the way (that is in the carburetor, the throttle valve and choke valve are fully opened); press a compression gauge against each spark plug hole, and, running the starter motor with a fully charged battery, read the maximum pressure obtained within 5-8 rotations of the motor. This measurement must be made as quickly as possible.



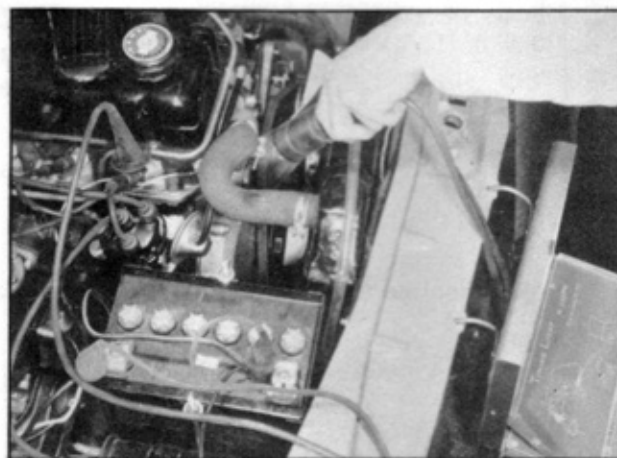
*Compression Gauge*

If the compression pressure of any one cylinder differs by 10 lb./sq.in. or more from that of another, the cause must be investigated.

- (6) Check and adjust the distributor: If the breaker contact points have defective contact surfaces, dress them and adjust the gap to 0.45-0.55 mm.

Also turn the cam of the distributor clockwise and check to see if the governor can carry out advancing function.

- (7) Adjust ignition timing correctly. By utilizing a power timing light, the function of the governor can be checked together with the ignition timing (Illumination of crank pulley will enable to inspect the conditions of running and advancing of the timing.) (B.T.D.C. 8°).

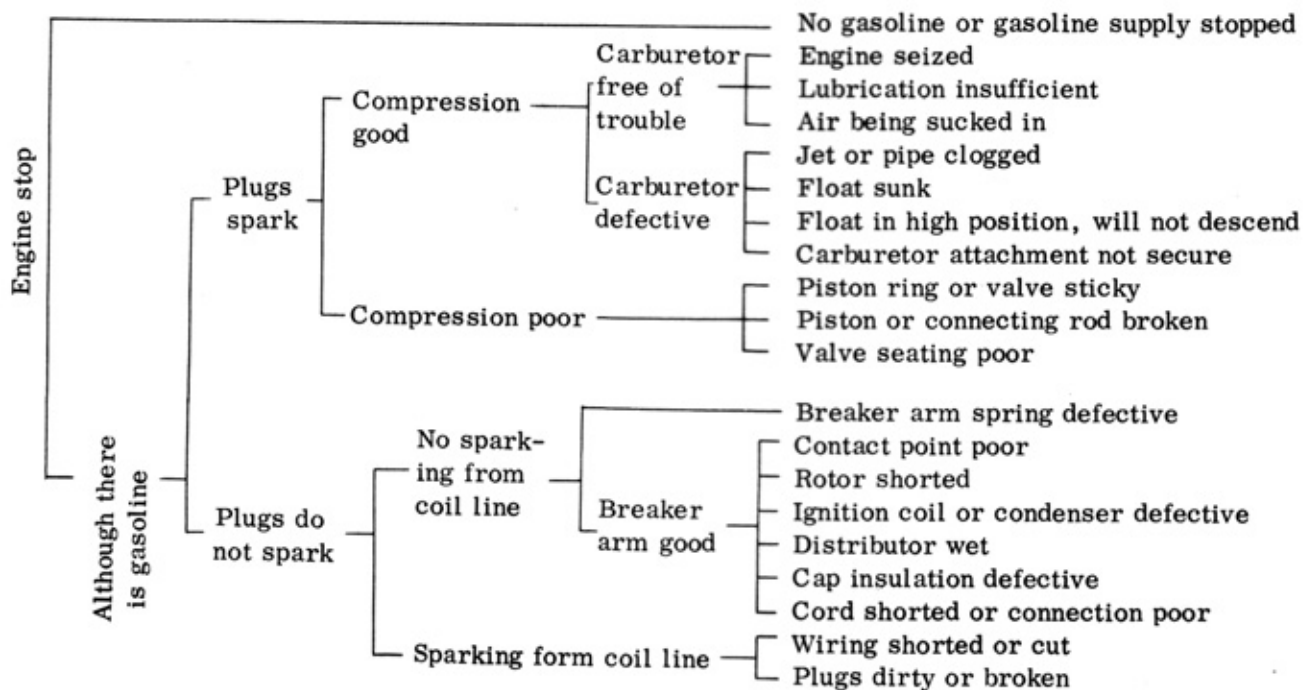
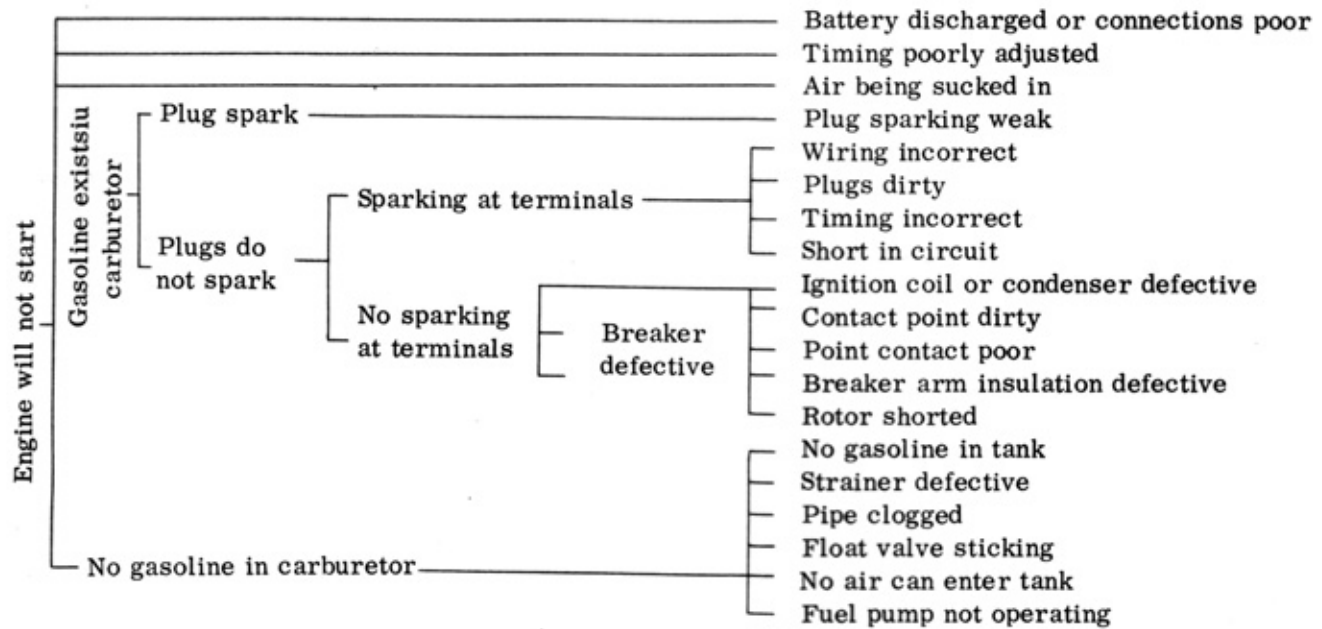


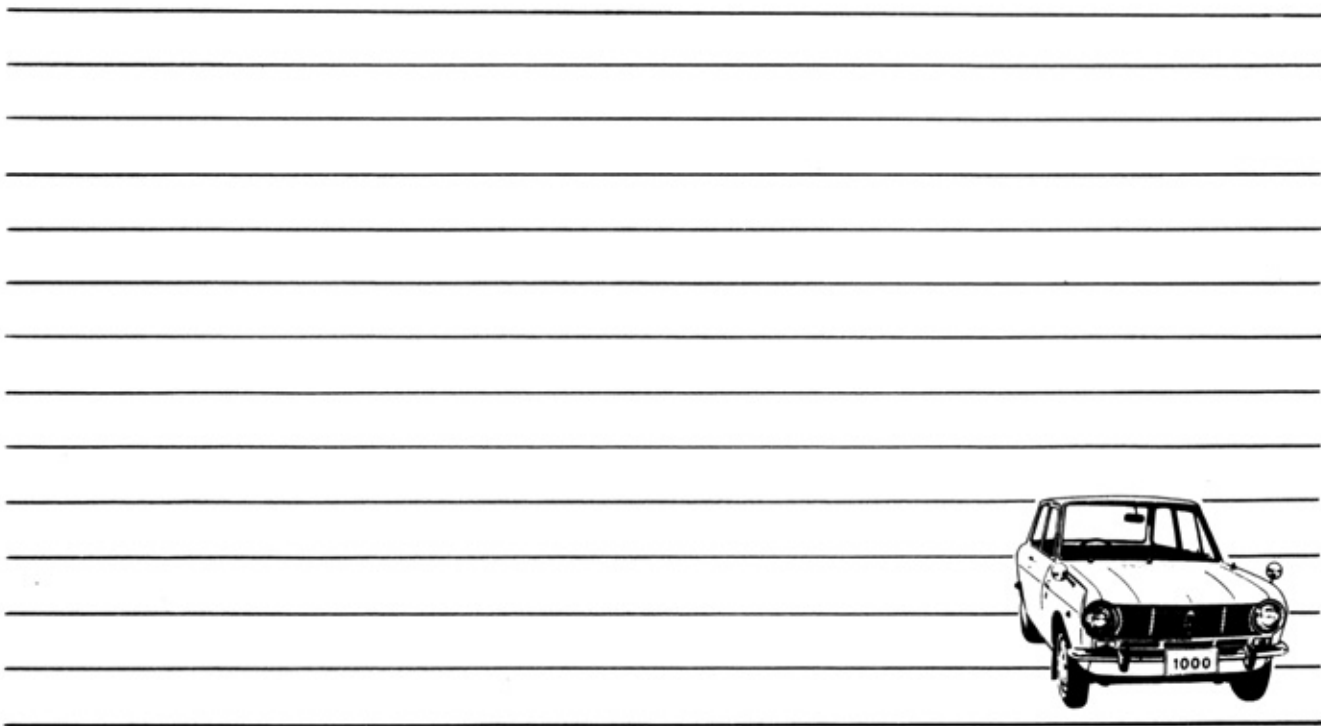
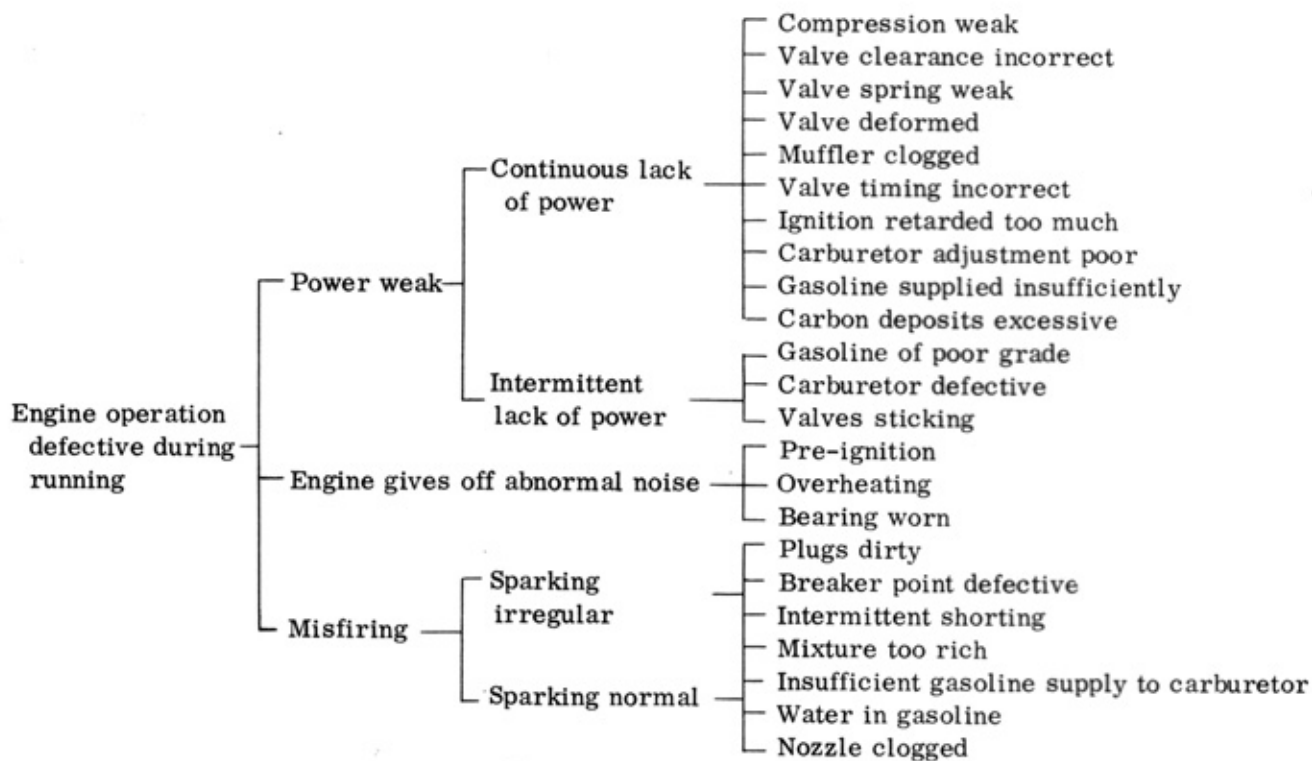
- (8) Inspection of fuel pump and gasoline strainer.
- (9) Adjust the slow setting of carburetor.
- (10) Checking operation of generator. Check the generating condition and functioning of the cut-out relay by means of indications of the ammeter.
- (11) Adjustment of slack in fan belt.
- (12) Adjustment of valve tappet clearance.
- (13) Road test. While driving in 3rd. speed at about 25 km/hr., suddenly step on the accelerator. If only a slight knocking results, the ignition timing is correct. Slow speed adjustment is made so that the speed is about 15 km/hr., when driving in 3rd. speed.



# DATSUN 1000

## Trouble Shooting Chart





# DATSUN 1000

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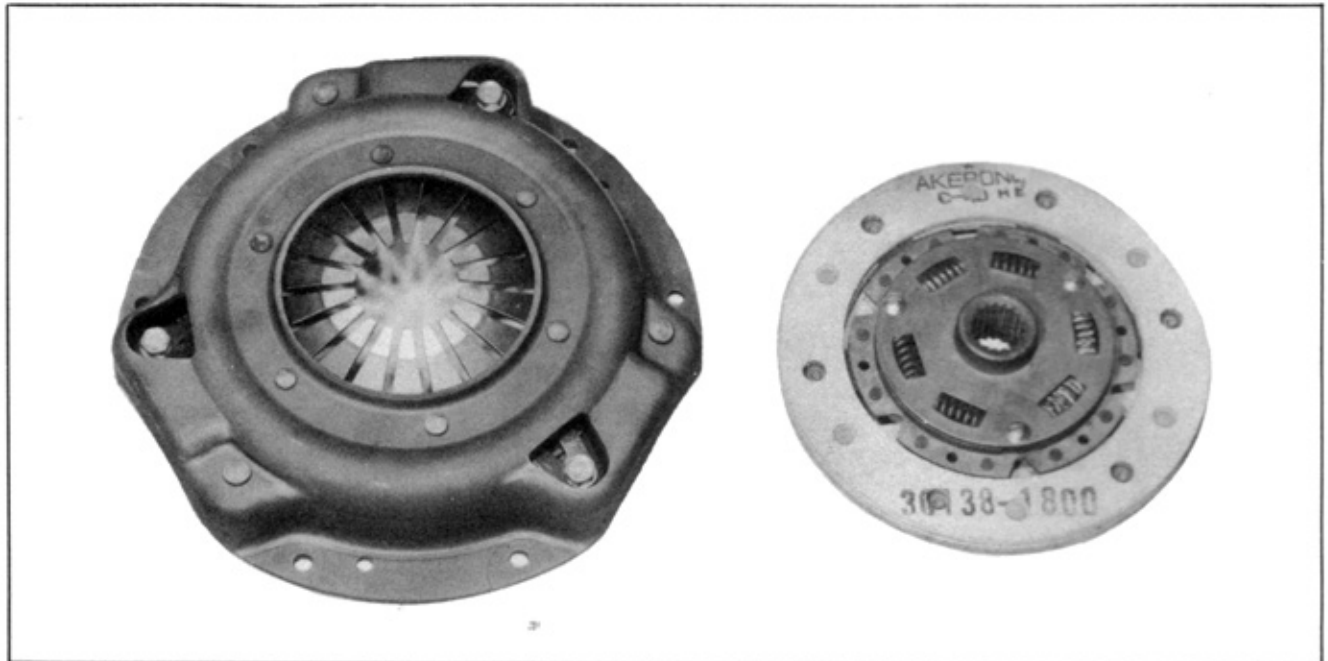


# CLUTCH

## Construction

The clutch mechanism is hydraulically operated for left handle drive and mechanically operated for right handle drive, and consists of

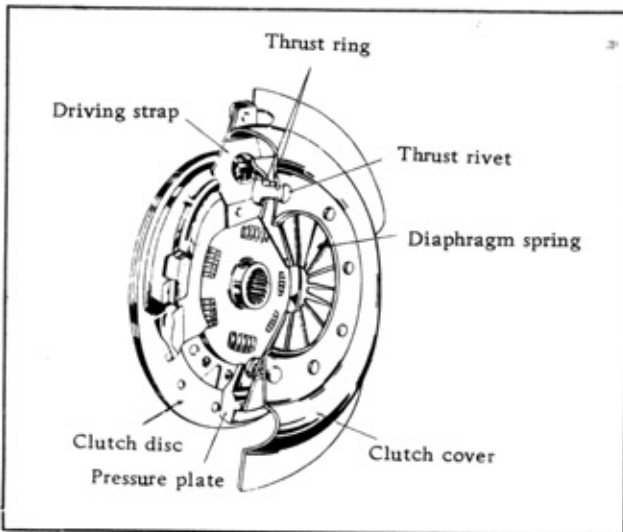
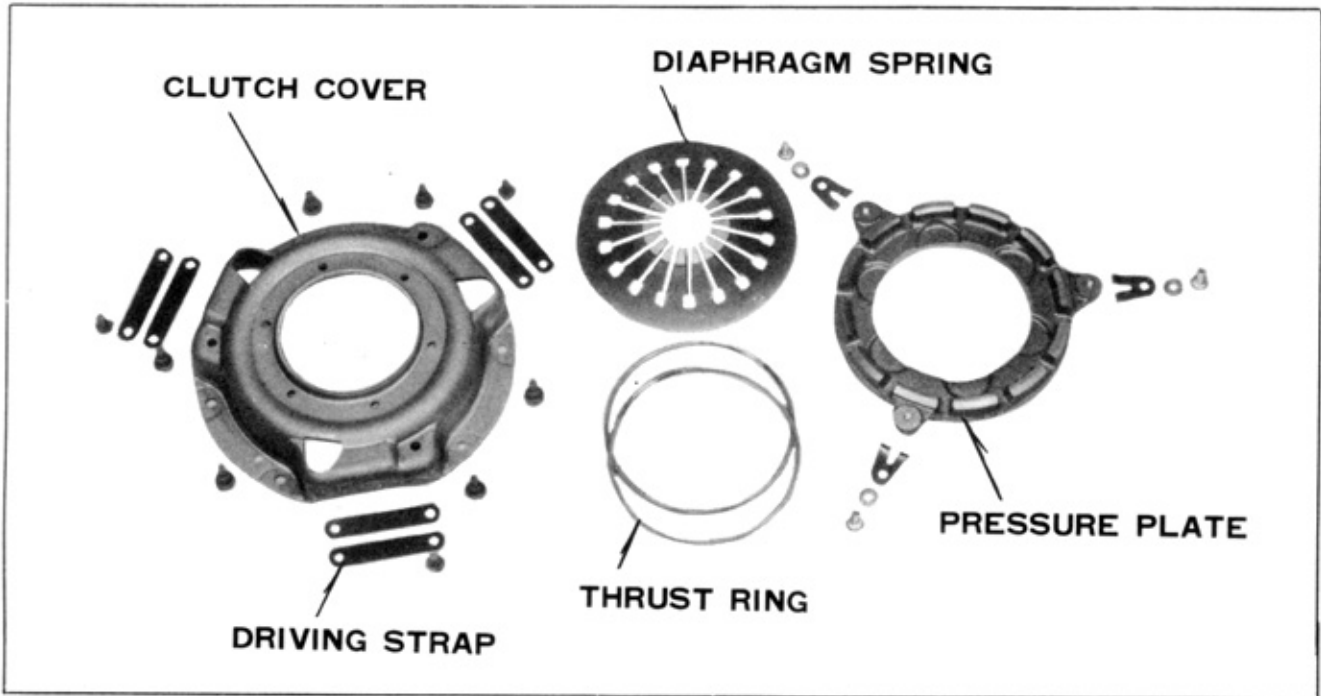
a pressure plate, a disc plate, diaphragm spring and cover assembly. The cover is bolted to the flywheel with a disc plate and pressure plate.



Spring height	31.5 mm at a position $41 \phi$ on the diaphragm spring
Thickness, distance piece	7.2 mm
Wear limit of clutch facing	Less than 0.5 mm by the head of rivet
Run out, facing	Less than 0.5 mm
Play of withdrawal lever	1.5 ~ 2.0 mm
Height clutch pedal	144.5 mm
Play of clutch pedal	15 ~ 20 mm
Facing thickness	3.2 mm
Facing out dia.	160 mm
Facing inside dia.	110 mm

# DATSUN 1000

The exploded view in following figure shows each of the parts.



The cover is bolted to the flywheel and encloses a disc plate, pressure plate.

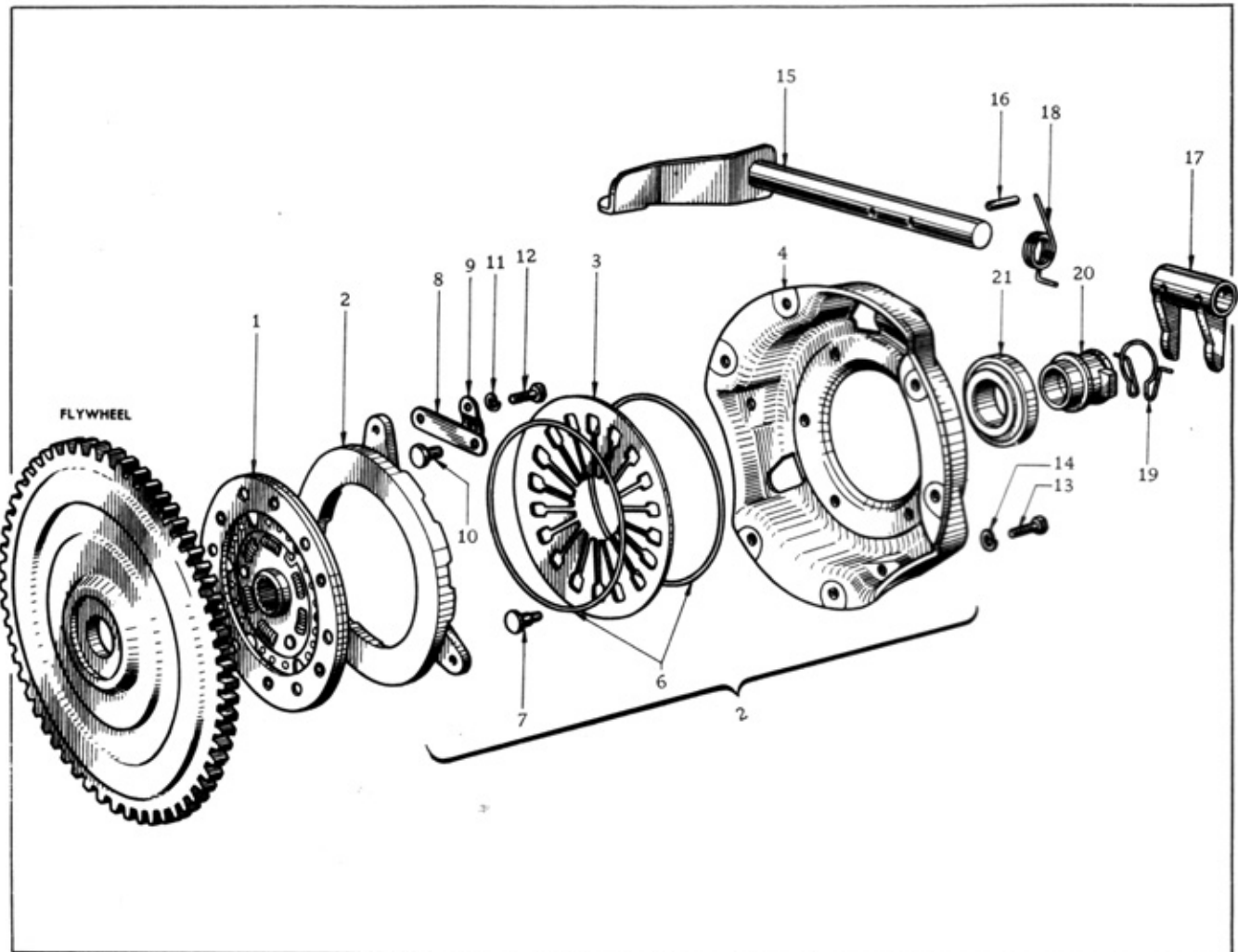
## Clutch Cover

The disc plate comprises a splined hub connected to a flexible steel plate by a spring mounted.

The annular friction facings are rivetted to the plate and damper springs are assembled around the hub to absorb power shocks and torsional vibration.

The diaphragm spring is interposed between two annular rings which provide fulcrum points for the diaphragm when it is fixed.

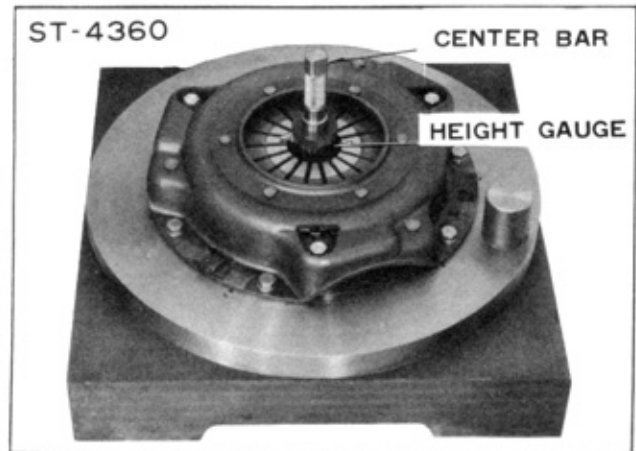
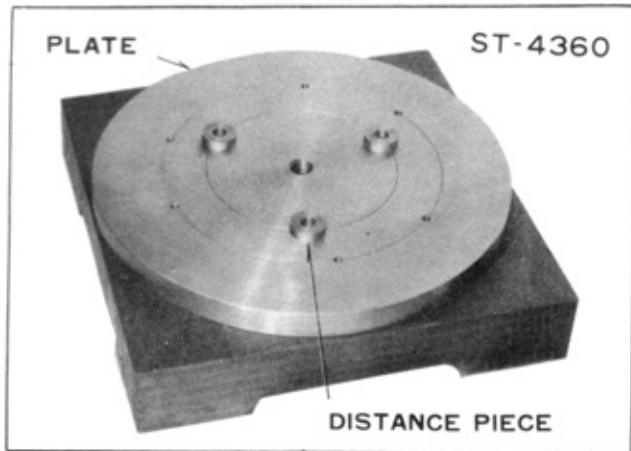
The rings and the diaphragm are located and secured to the cover by six equally spaced rivets.



*Clutch*

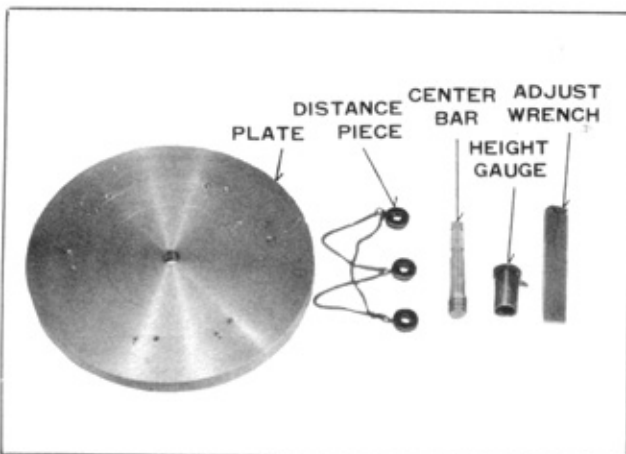
1	Ass'y-disc, clutch	12	Washer-lock
2	Ass'y-cover, clutch	13	Bolt
3	Spring-diaphragm	14	Washer-lock
4	Cover-clutch	15	Ass'y-shaft, clutch release
5	Plate-pressure	16	Pin-taper, release yoke
6	Ring-thrust	17	Yoke-clutch release
7	Rivet-thrust ring	18	Spring-return, clutch yoke
8	Plate-hanger	19	Spring-holder
9	Strap-driving	20	Sleeve-bearing, clutch release
10	Rivet-driving strap	21	Bearing-clutch release
11	Bolt		

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To adjust for clutch diaphragm spring, place the distance pieces on the base plate and set the clutch assembly on the base plate by bolts.

Screw the center bar through the height gauge.

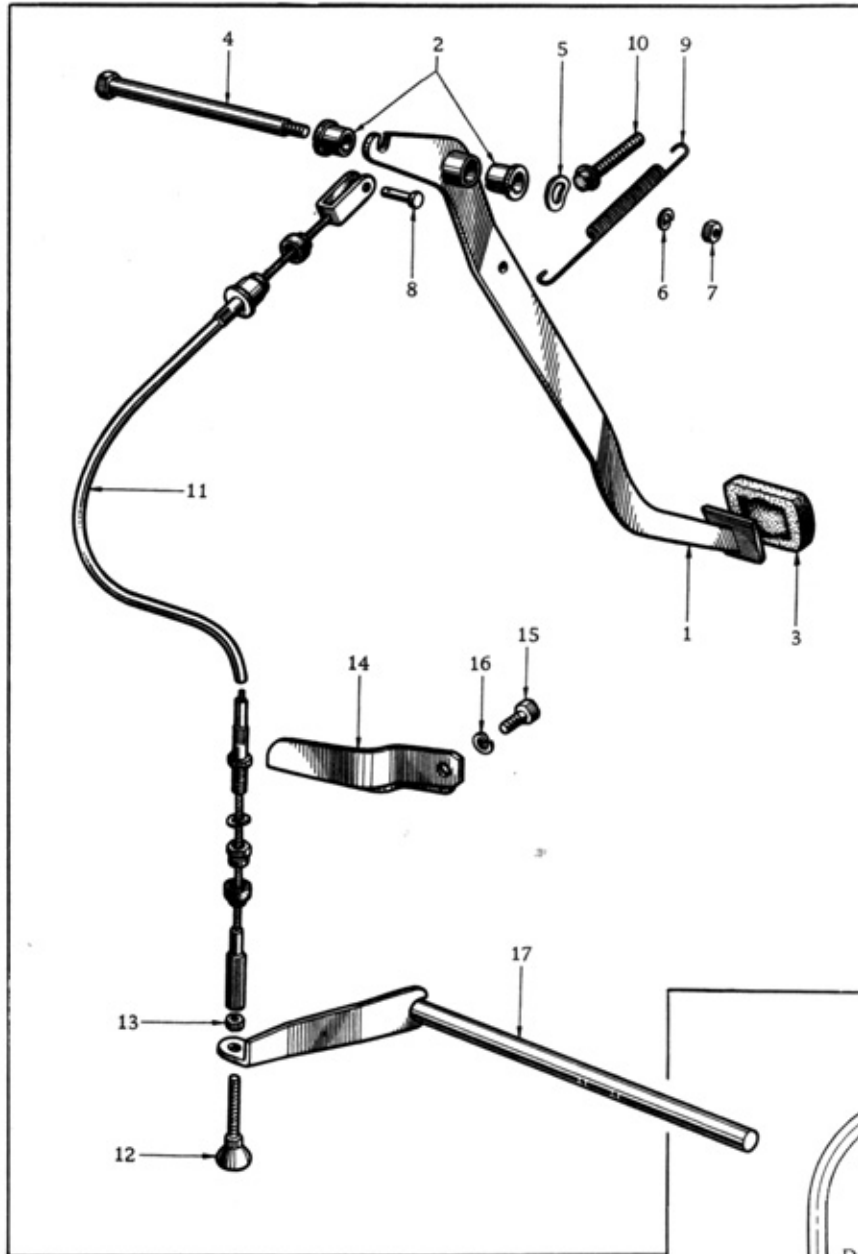


Adjustment for operating wire type system clutch operating cylinder & master cylinder for left handle driving.

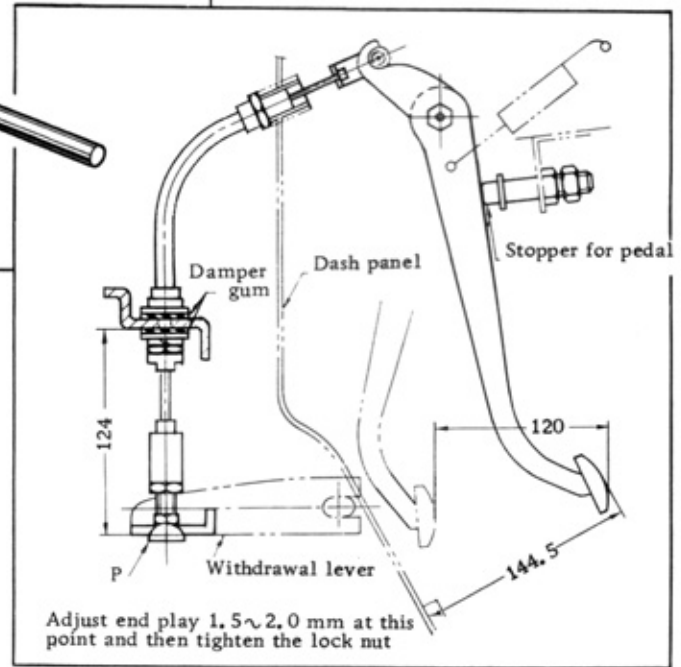
Correct and adjust the height of the diaphragm spring by adjust wrench.

Do not disassemble the pressure plate and cover body which balanced as one set.

Master cyl. inside dia.	15.87 mm (5/8 in.)
Piston stroke	31.5 mm
Operating cyl. inside dia.	19.05 mm (3/4 in.)
Piston stroke	23.5 mm



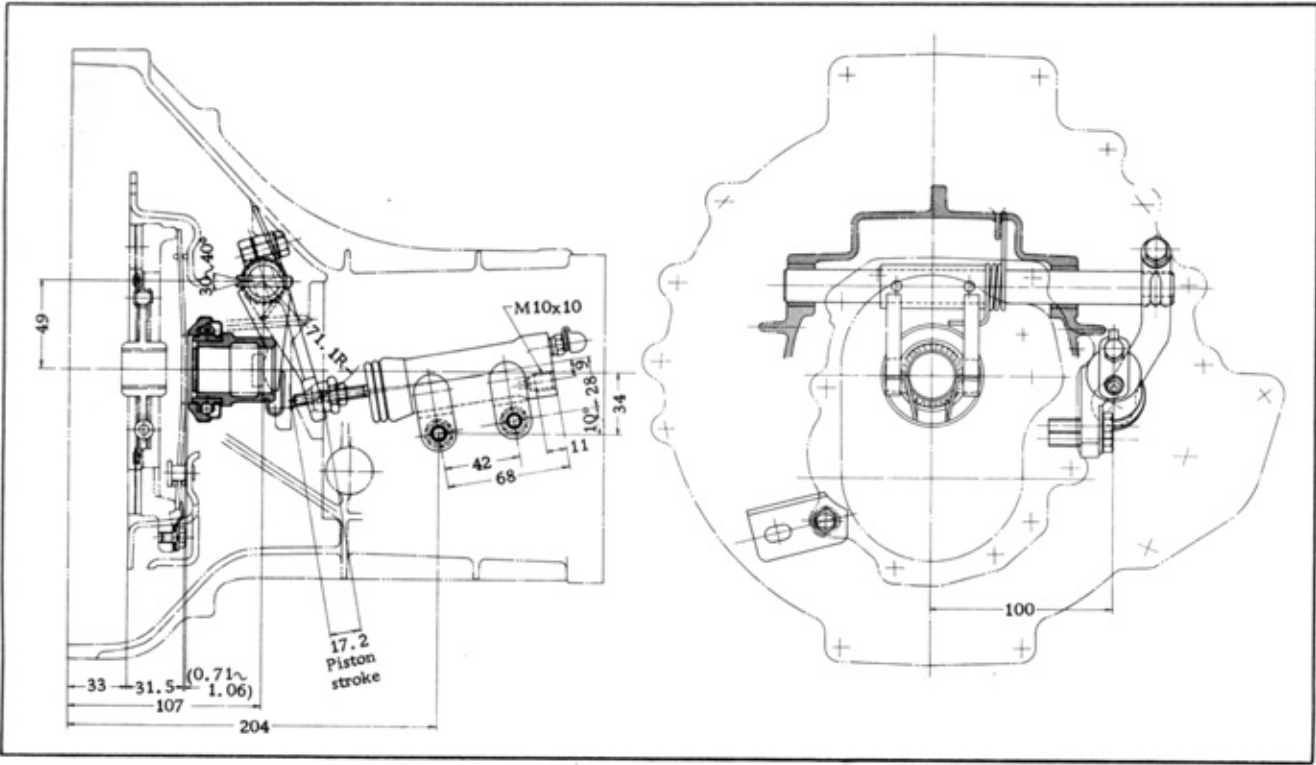
- |    |                               |
|----|-------------------------------|
| 1  | Ass'y-pedal, clutch           |
| 2  | Push-fulcrum, clutch pedal    |
| 3  | Cover-pedal pad               |
| 4  | Pin-fulcrum, clutch pedal     |
| 5  | Washer-spring                 |
| 6  | Washer-lock                   |
| 7  | Nut                           |
| 8  | Pin-clevis                    |
| 9  | Spring-return                 |
| 10 | Stopper-pedal                 |
| 11 | Ass'y-cable, clutch operating |
| 12 | Bolt-clutch cable             |
| 13 | Nut                           |
| 14 | Bracket-clutch cable lower    |
| 15 | Bolt                          |
| 16 | Washer-lock                   |
| 17 | Ass'y-shaft, clutch release   |



*Clutch Pedal & Linkage*



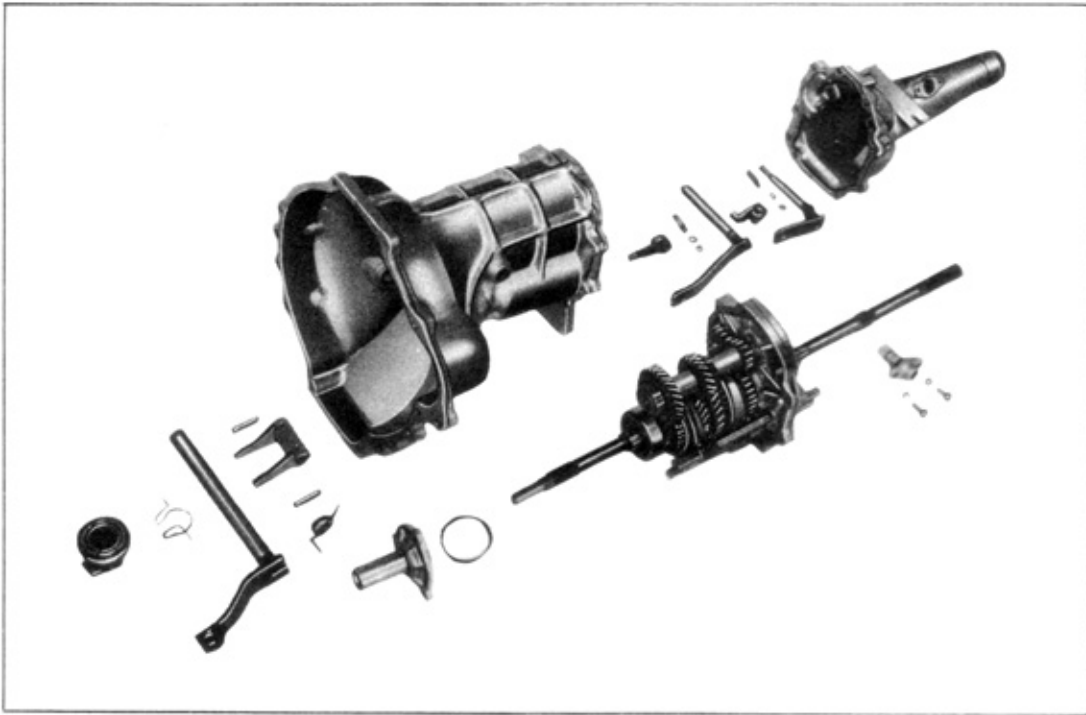
**DATSUN 1000**



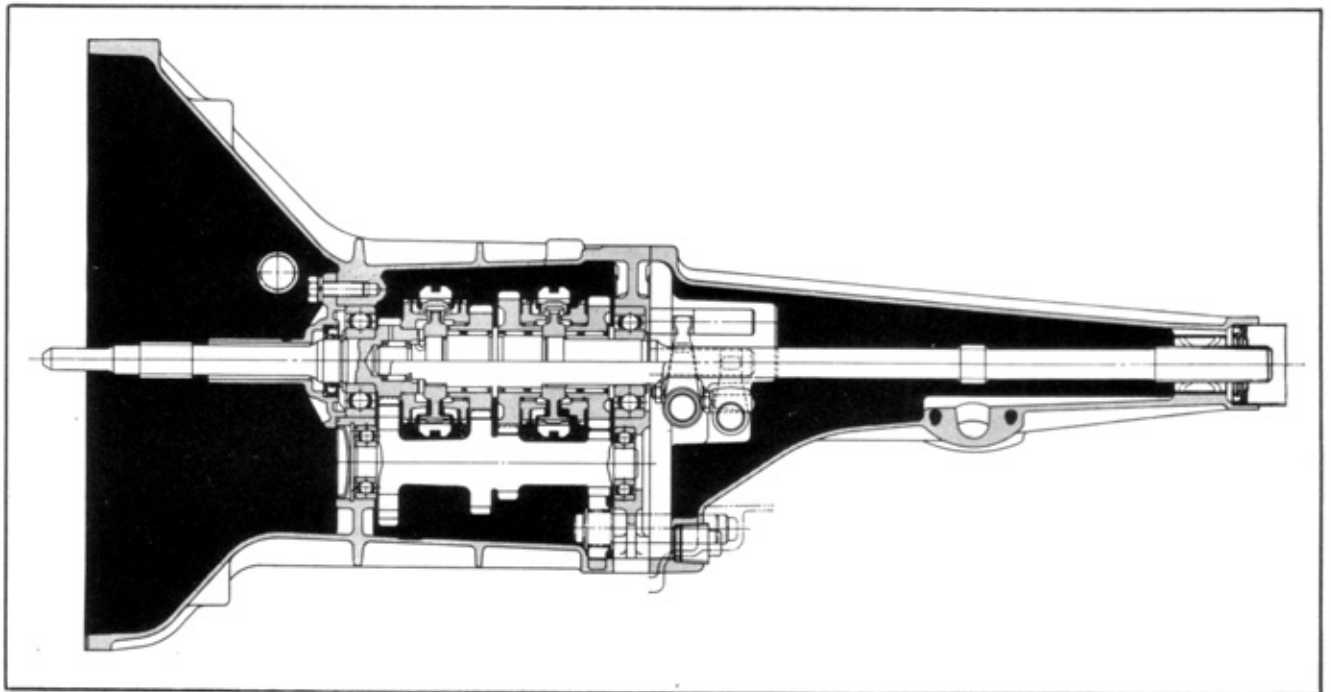
*Clutch Operating Cylinder & Master Cylinder for Left Handle*



TRANSMISSION



*Components of Transmission*



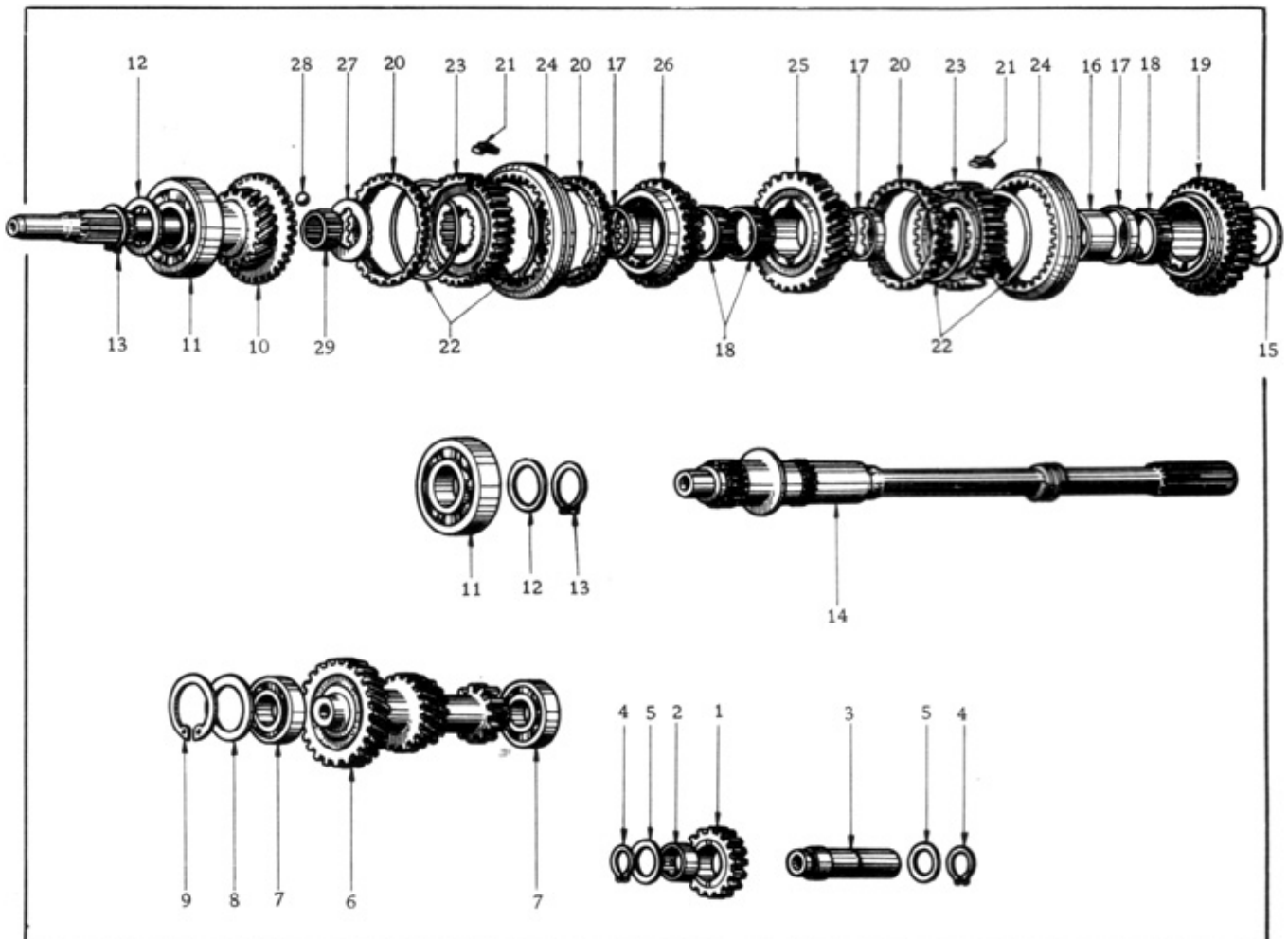
*Sectional View of Transmission*

# DATSUN 1000

Model	3 stage for forward, 1 stage for reverse Remote control Full-synchromesh on forward gears.	4 stage for forward, synchromesh on for speed
Type of gear	Synchromeshed helical gear type	#2nd, 3rd & 4th gear
Ratio #1	3.38	3.76
Ratio #2	1.73	2.17
Ratio #3	1.00	1.40
Ratio #4		1.00
Reverse	3.64	3.64
Final gear ratio	4.11 : 1	4.375 : 1 (van)

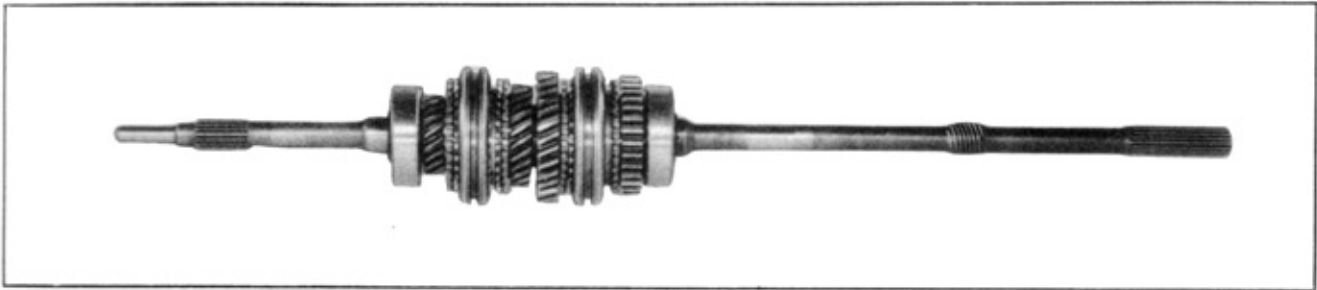
Back lash of each meshing gear	0.05 ~ 0.1 Main drive gear counter driven gear, second gear and first gear
Gear ratio of speed meter	4.00 (16/4)
<b>MAIN DRIVE GEAR</b> Main drive gear Nos.	19
<b>MAIN SHAFT</b> Second gear Nos. First gear Nos. Reverse gear Nos. Reverse gear thrust clearance First gear thrust clearance Second gear thrust clearance Front gear thrust clearance Clearance between boulk ring & each gear Cover adjusting shim Bearing type of spline	25 31 31 0.15 ~ 0.25 mm 0.15 ~ 0.25 mm 0.1 ~ 0.3 mm 0.1 ~ 0.35 0.8 ~ 1.45 mm 0.5, 0.2, 0.1 mm (Front) Ball bearing (Rear) Bushing
<b>COUNTER GEAR SHAFT</b> Driven gear teeth Nos. Counter gear teeth Nos. First gear teeth Nos. Reverse gear Clearance of front thrust Thrust washer size Bearing type of spline	29 22 14 13 0.02 ~ 0.08 mm 0.8, 0.9, 1.0, 1.1, 1.2, 1.3 mm Front & rear ball bearing
<b>REVERSE IDLER</b> Gear teeth Nos. Clearance between shaft & bushing Clearance between gear & adapter plate Clearance to snap ring	17 0.032 ~ 0.077 0.1 ~ 0.5 0.1 ~ 0.4
<b>FORK SHIFT</b> Length of locking ball spring	16.4 mm at 7 kg

## Assembling Order of Main Shaft



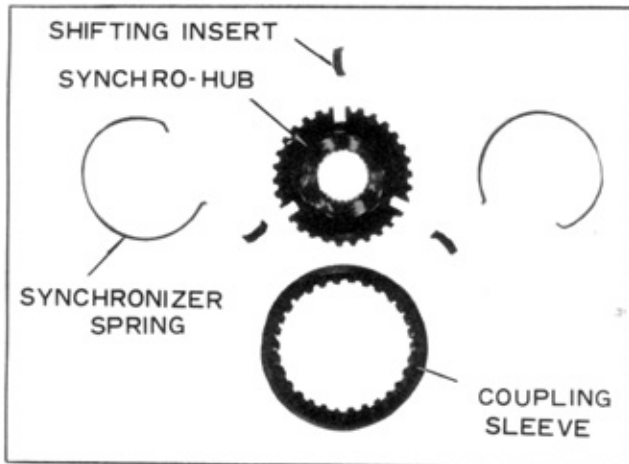
## Transmission Gear

1	Ass'y-gear, reverse idler	15	Washer-thrust, main shaft
2	Bushing-gear, reverse idler	16	Bushing-main shaft, reverse gear
3	Shaft-reverse idler	17	Spacer-needle bearing
4	Ring-map, reverse idler	18	Bearing-needle, main shaft
5	Washer-thrust, reverse idler	19	Ass'y-gear, reverse, main shaft
6	Ass'y-gear, counter	20	Ring-baulk
7	Bearing-ball, counter shaft	21	Insert-shifting
8	Washer-adjusting, counter bearing	22	Spring-synchronizer
9	Ring-map, counter bearing	23	Hub-synchronizer
10	Ass'y-gear, main drive	24	Sleeve-coupling
11	Bearing-ball, main shaft	25	Ass'y-gear, 1st speed
12	Washer-main bearing	26	Ass'y-gear, 2nd speed
13	Ring-map, main drive gear & main shaft	27	Washer-thrust, synchronizer hub
14	Shaft-main	28	Ball-steel
		29	Bearing-pivot, main shaft

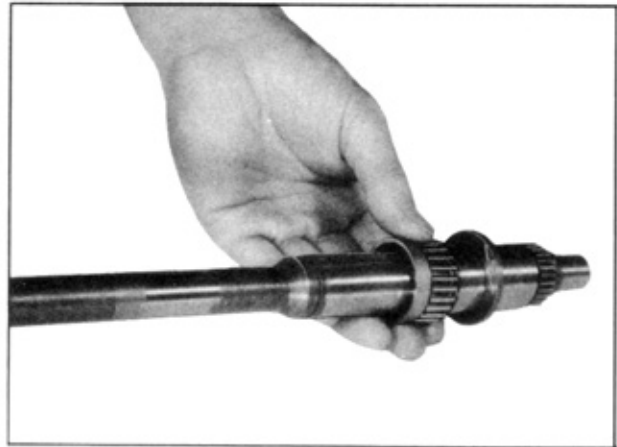


*Assembling Order Through the Main Shaft*

**Assemble the Coupling Sleeve to Synchro-hub**

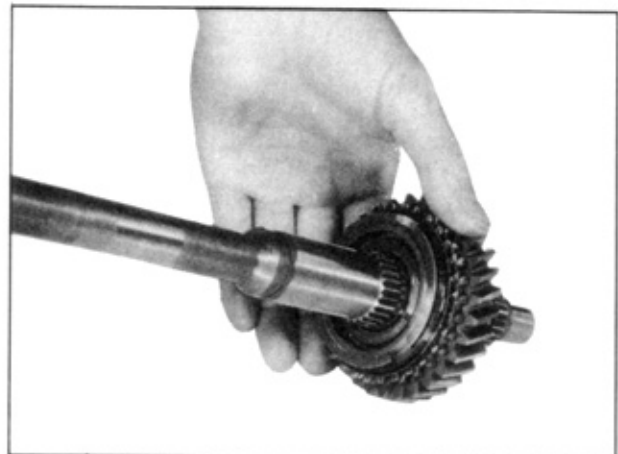
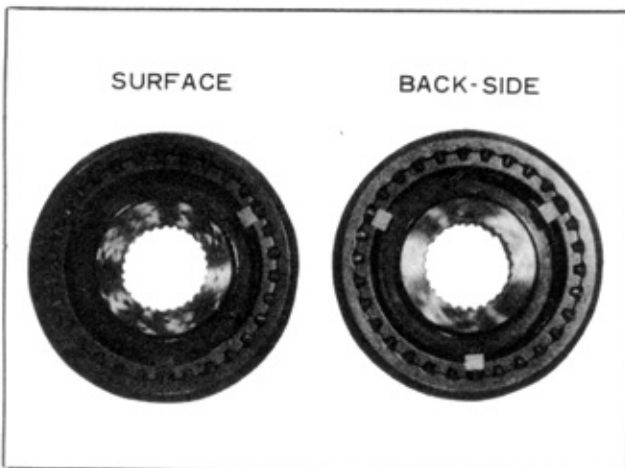


Assemble the needle bearing and bearing sleeve to rear side of the main shaft.



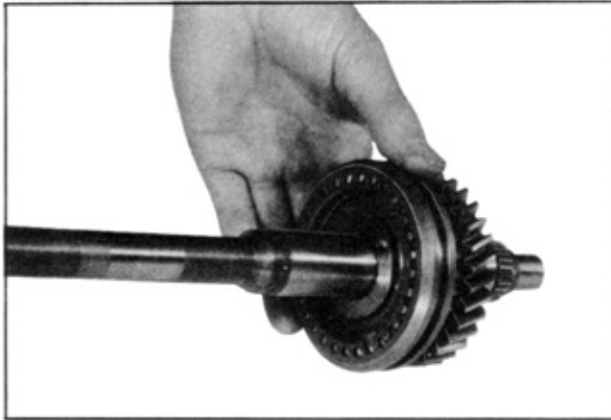
*To Apply Gear Oil*

Set up the main shaft gear & baulk ring as shown.

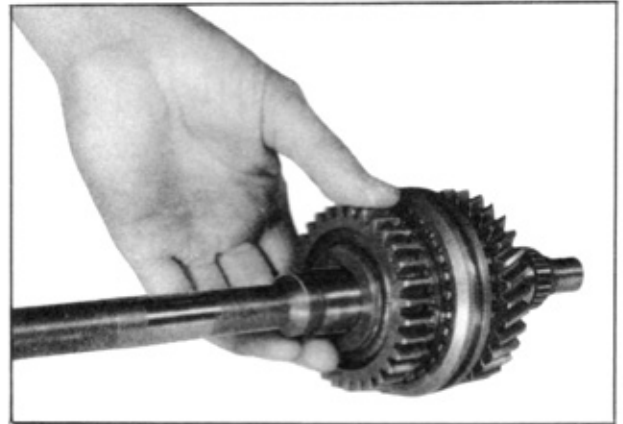


*To Apply Cup Grease*

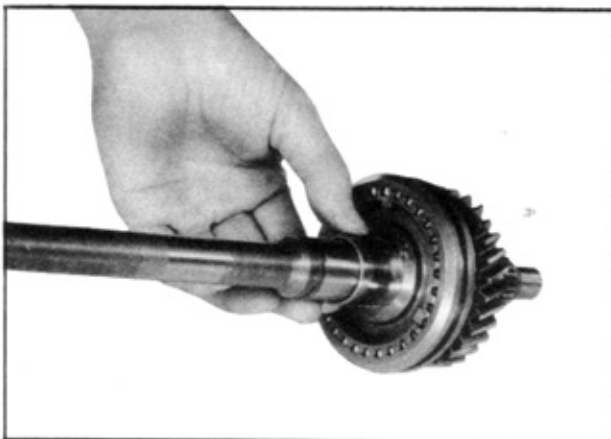
Insert the synchro-hub fitting shifting insert to groove of baulk ring.



Insert the reverse gear and thrust washer.



Insert the main shaft bush of reverse speed.

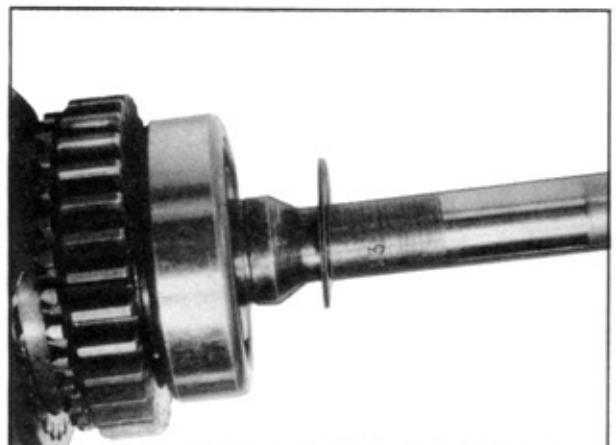
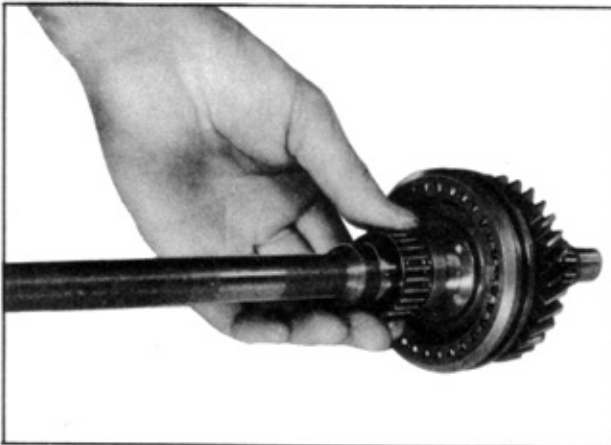


Press the main bearing from rear side of the main shaft and then insert washer and snap ring.

## Inspect Back Lash About Assembled One

First gear and main shaft. Reverse gear and thrust washer.

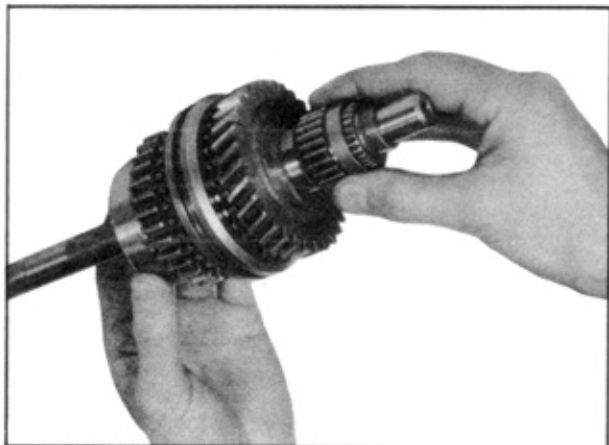
Put the needle bearing spacer and bearing by order.



*To Somer Gear Oil for Needle Bearing*

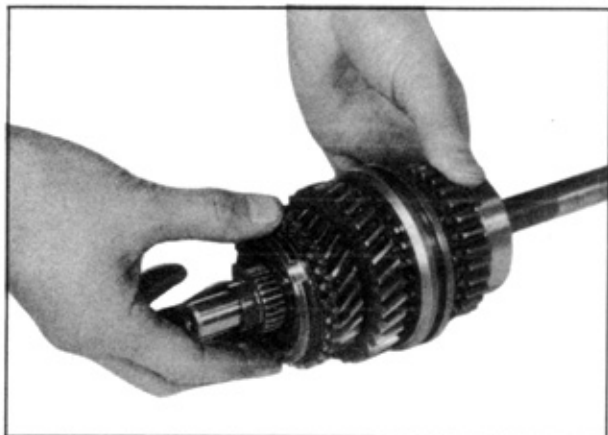
## DATSUN 1000

Set up the needle bearing and needle bearing spacer from front of main shaft.

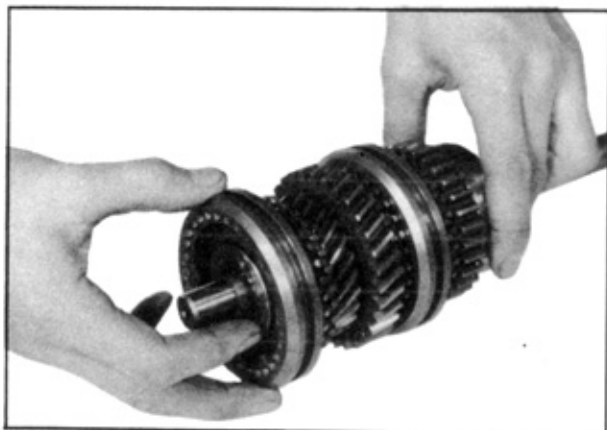


*Apply Gear Oil*

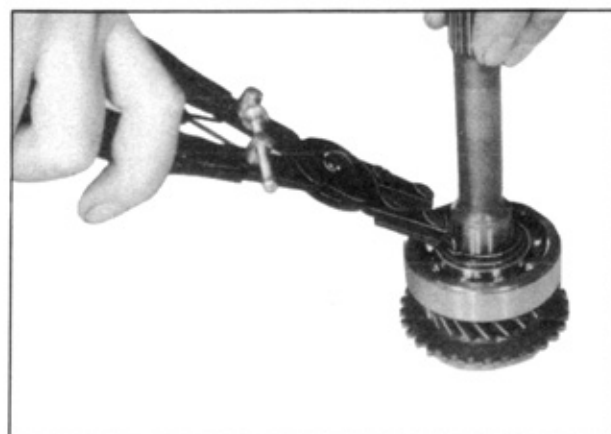
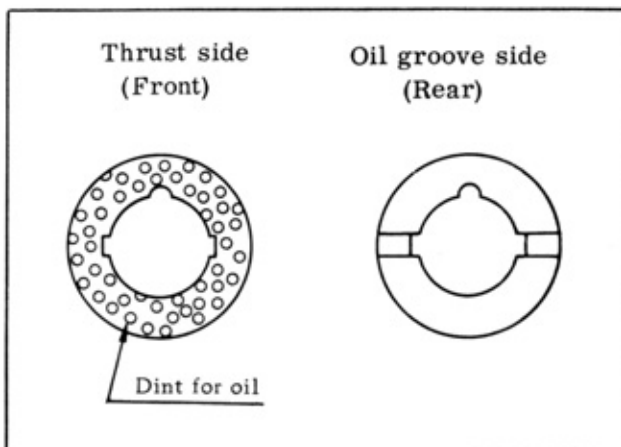
Put the second gear and baulk ring on the shaft.



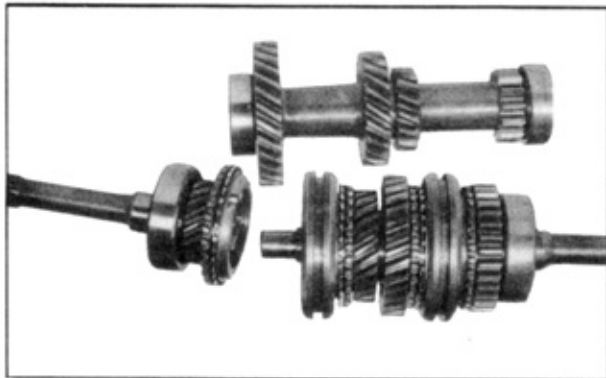
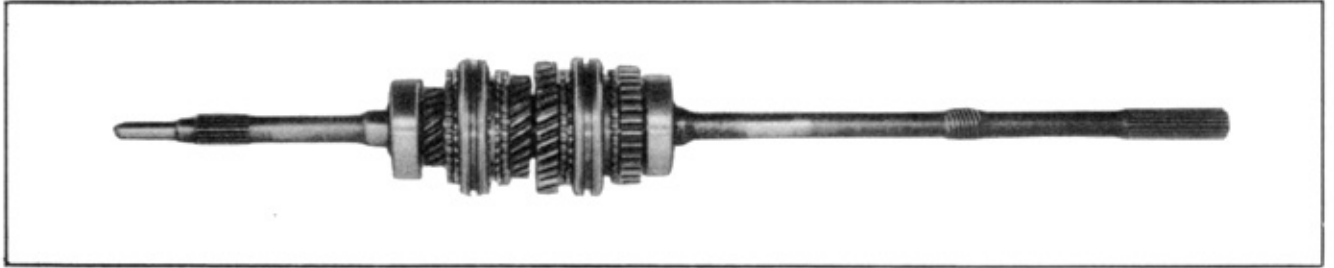
*To Smear Cup Grease for  
Inside of Baulk Ring*



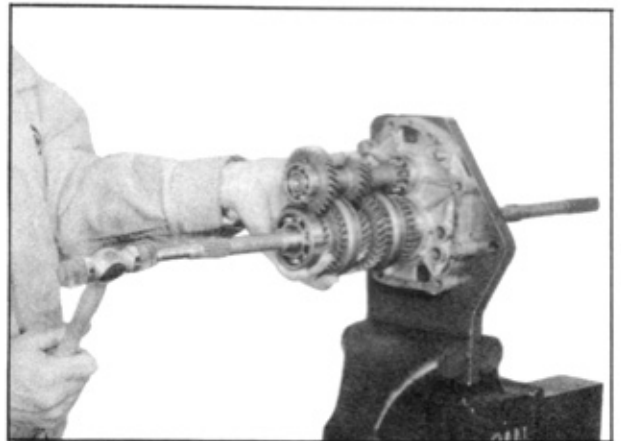
Insert the synchro-hub fitting the shifting insert for groove of baulk ring.



Insert steel ball, thrust washer of synchro-mesh hub and then pilot bearing.  
To smear grease for dint of washer.  
Press the main bearing to the main drive gear (front). Put the washer of main bearing washer and snap ring.

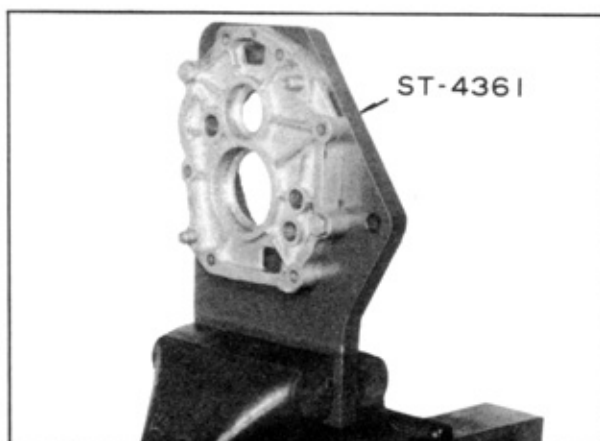


Tap and set the main shaft with wooden hammer fitting the center of counter bearing after inserting main bearing rear into the hole of plate.

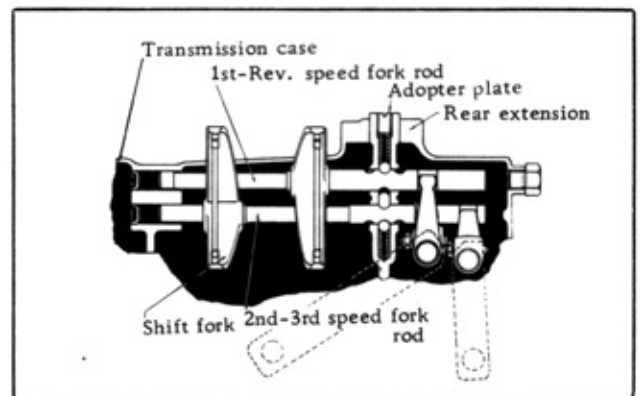


## Assembling

Hold the adapter plate on the bench(ST-4361).



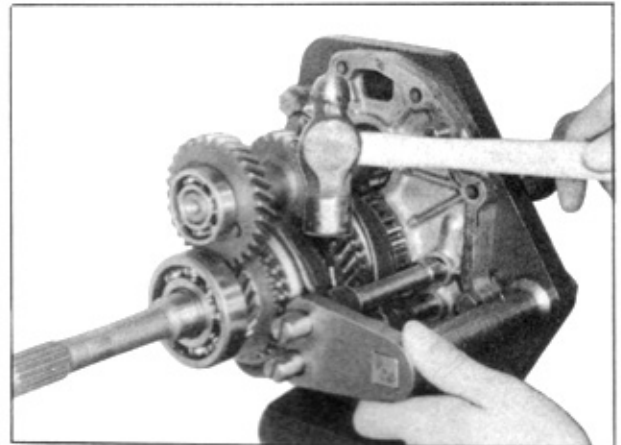
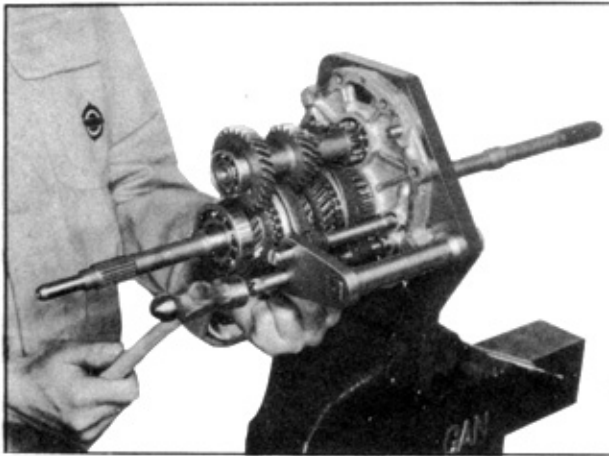
Fix the shift fork for each rod.



Set the main shaft assembly and counter shaft fitting with gears each other as shown.

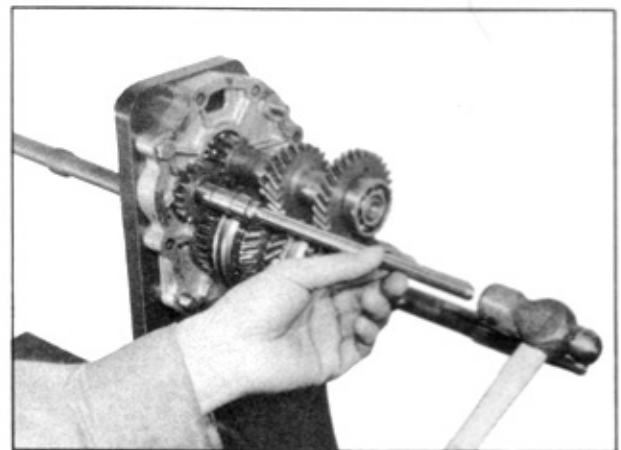
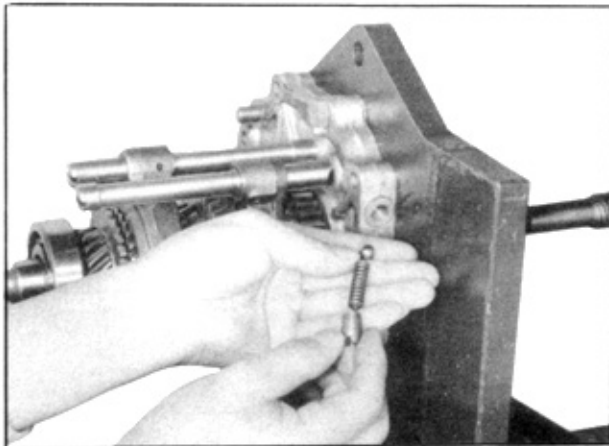


To fix the second, third speed fork rod after setting check balls and springs.



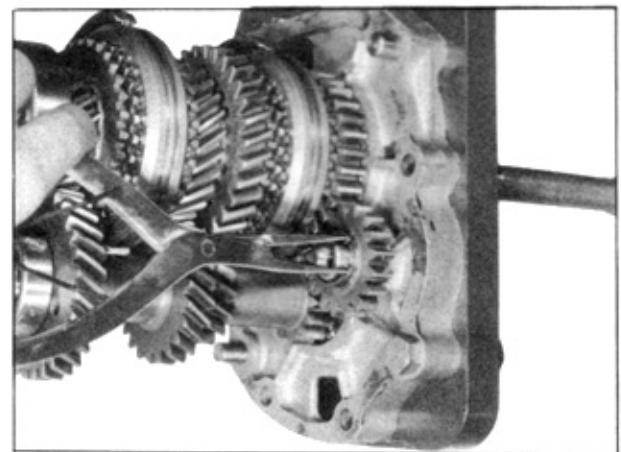
Inserting the reverse idler gear and thrust washer and set them up by tapping with a brass bar these gears should be neutral position in this procedure.

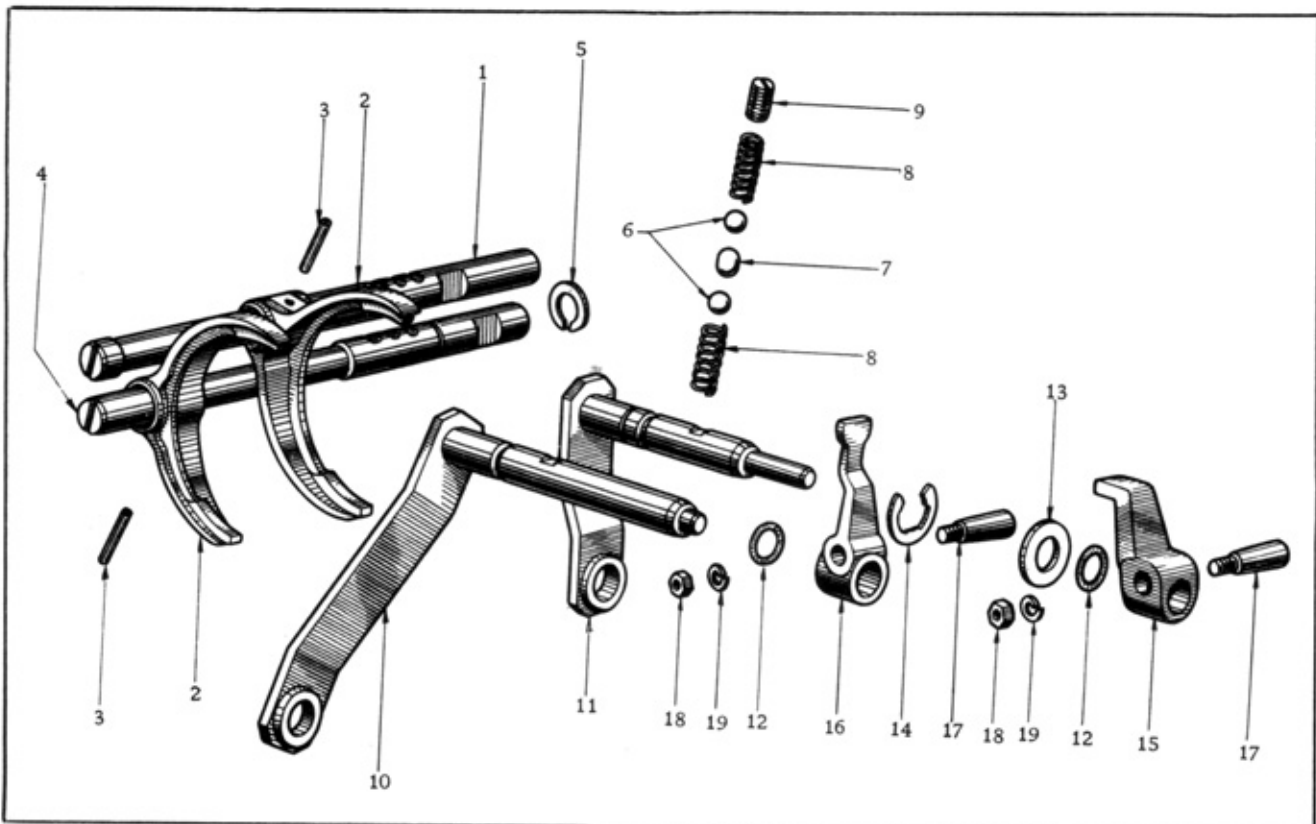
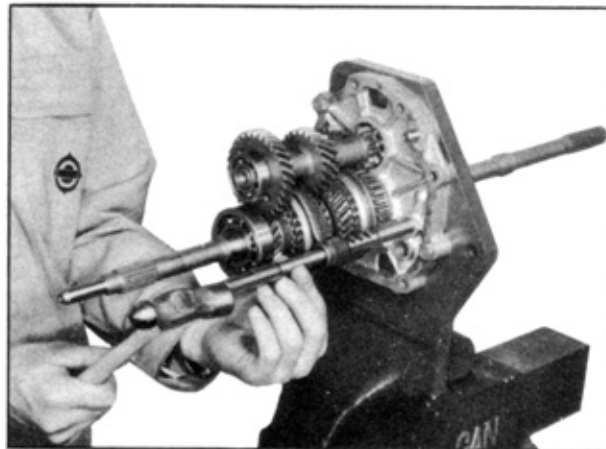
Set the stopper link and inter lock plunger.  
Fix the first, reverse and speed fork rod.  
Insert the check ball and check ball spring into the plug hole and set it.



Screw the plug up to level against the plate edge.

Tapping the retain pin of shift fork and fix the adapter plate as finding the hole of reverse idler shaft as upper side.





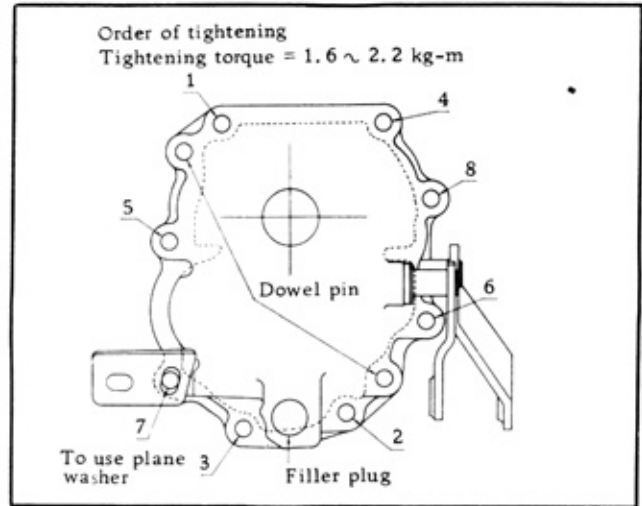
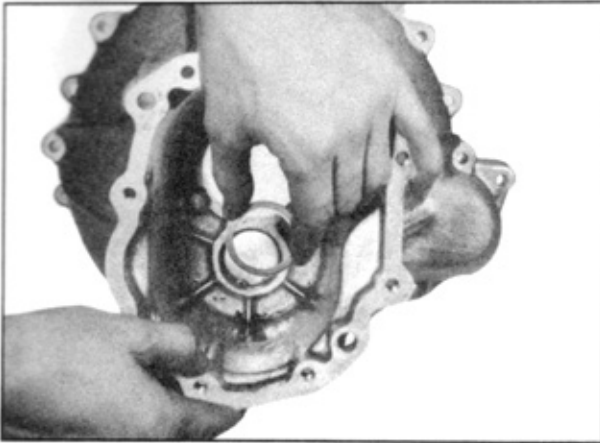
*Transmission Gear Shifting*

1	Rod-fork, reverse & 1st	11	Comp.-shaft, cross, 2nd & 3rd
2	Fork-shift	12	Ring-"O", cross shaft
3	Pin-retaining, fork	13	Washer-thrust, cross shaft
4	Rod-fork, 2nd & 3rd	14	Ring-"E", cross shaft
5	Ring-stopper	15	Lever-operating, 2nd & 3rd speed
6	Ball-checking	16	Lever-operating, 1st & reverse speed
7	Plunger-inter lock	17	Pin-retaining
8	Spring-checking ball	18	Nut
9	Plug-checking	19	Washer-lock
10	Comp.-shaft, cross, 1st & reverse		

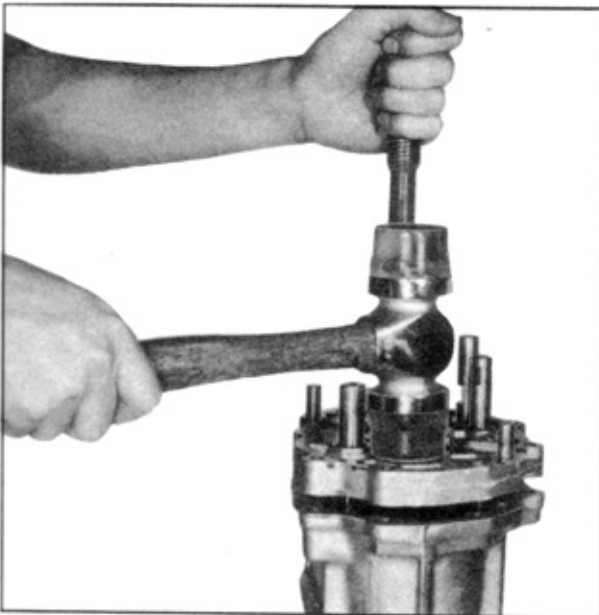
# DATSUN 1000

Fix the reverse idler shaft with thrust washer and snap ring for front and rear side. (Back lash of idler gear and washer 0.1 ~ 0.5 mm).

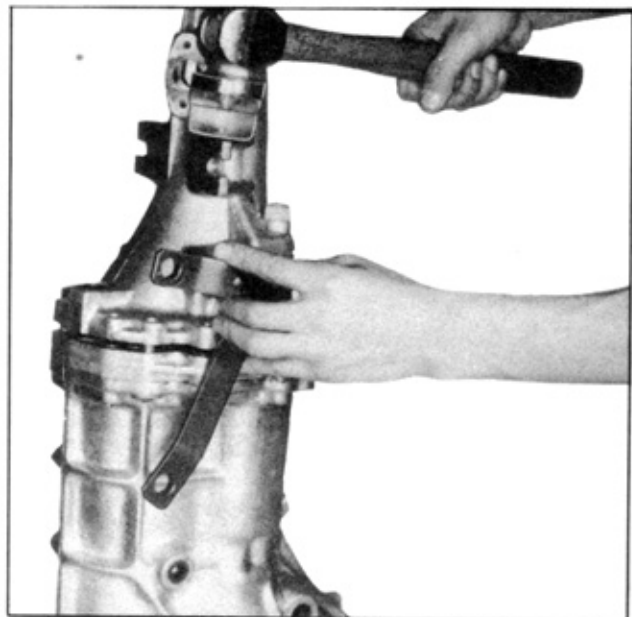
Put the case of transmission back side up.



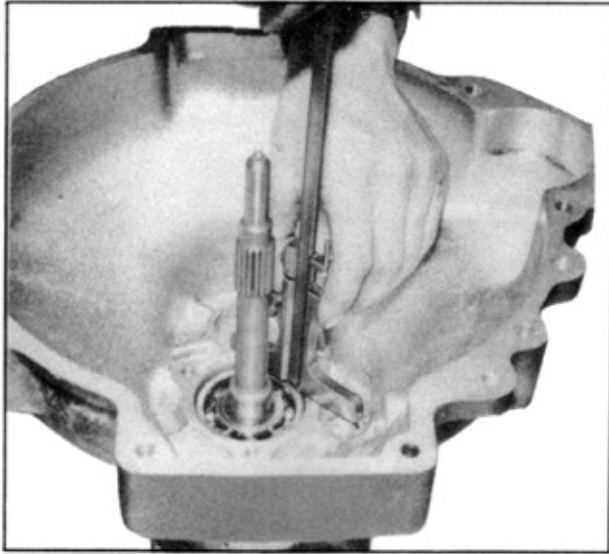
Fix the washer of counter bearing and set up the adapter plate to the gear box.



Complete with rear extension to the gear box by fix bolts.



Select the shims for front cover.



### Front cover adjusting shims

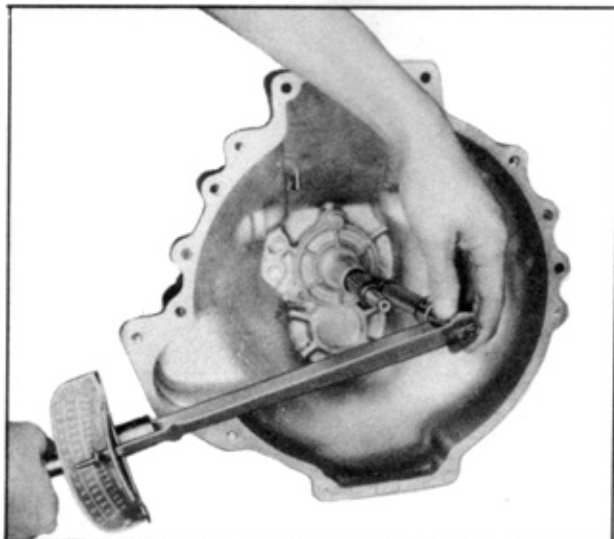
Depth from fixed face of the front cover to end face of outer race of main bearing.

Part No.	Thickness	
32208-18000	0.5	5 mm ± 0.15 0
32208-18001	0.2	
32208-18002	0.1	

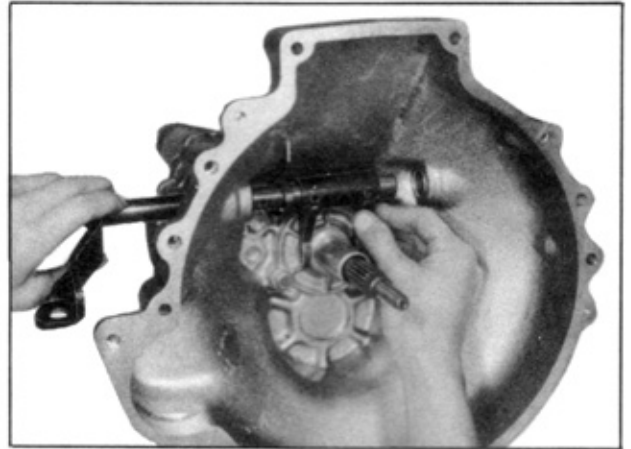
Set the oil seal with "O" ring and adjusting shim to front cover.

Tightening torque = 1.0 ~ 1.4 kg-m

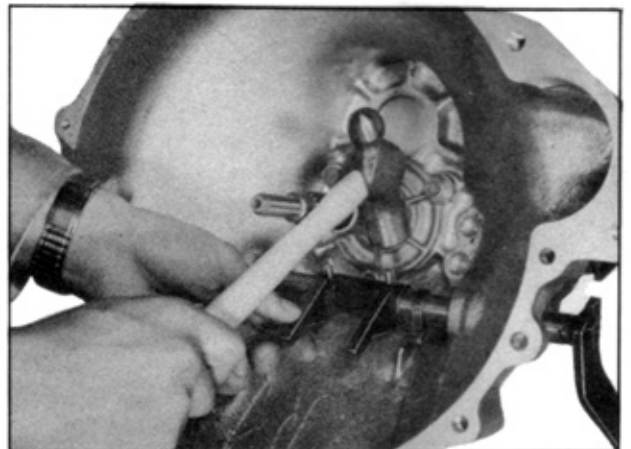
To apply cup grease for lip of oil seal.



Assemble the return spring and clutch release yoke.



Fix the taper pin to the yoke.

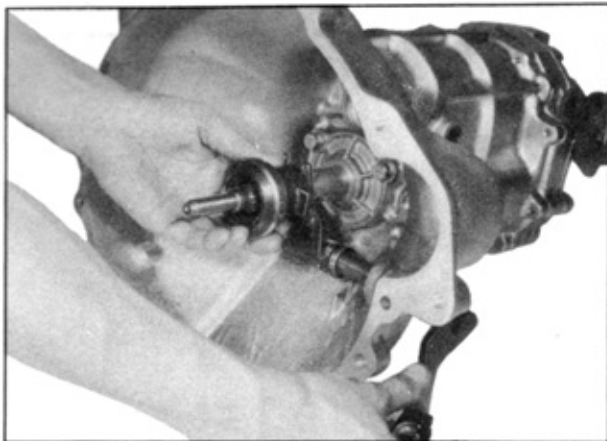


Press the release bearing into the sleeve and complete the release bearing assembly with holder.

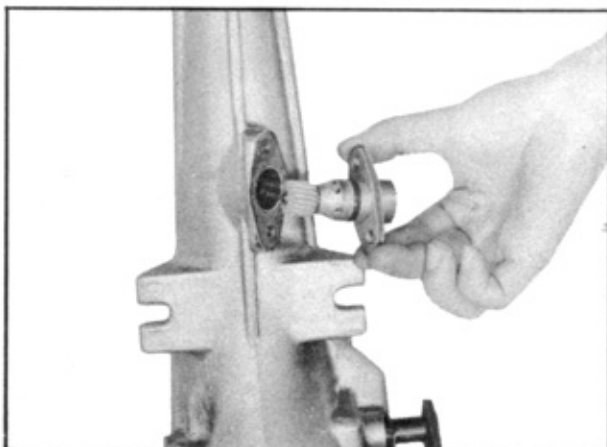


# DATSUN 1000

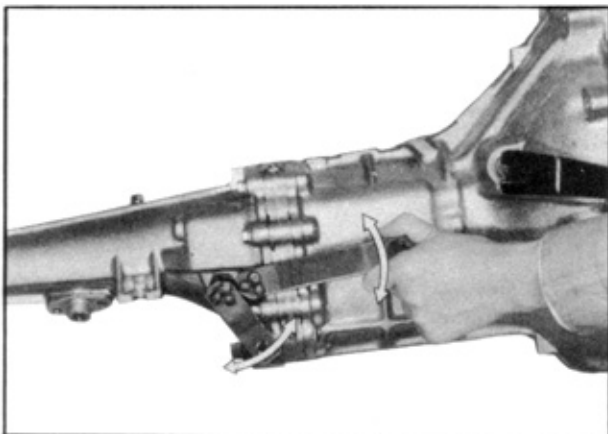
Fix the sleeve to front cover.



Insert the pinion gear assembly of speed meter.

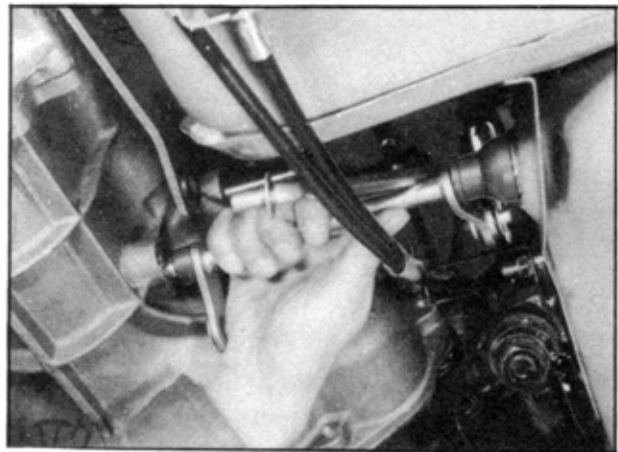


To smear cup grease on the teeth to confirm about condition of main drive gear and main shaft.



## Dismounting the Transmission Assembly from the Car

- Disconnect the front tube of muffler.
- Drain gear oil from the case of transmission.
- Disconnect speedometer cable.
- Detach the propeller shaft.
- Disconnect remote control linkage and side lever of transmission.

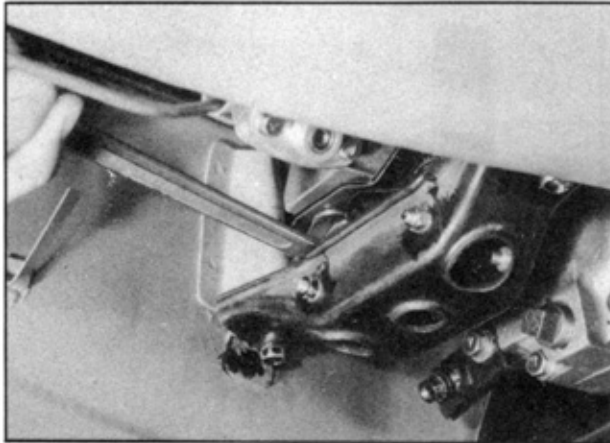


- Separate clutch operating wire and withdrawal lever.
- Take off the starting motor.
- Disconnect the plate of dust sealed.

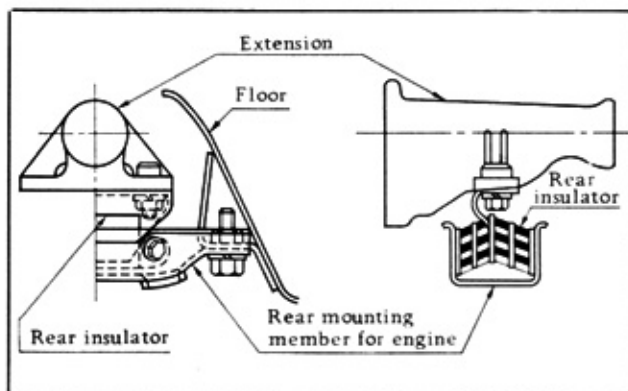


- Jack up the body of transmission.
- Unscrew fixing bolts to the engine block.

- Unscrew the rear engine mounting bolts, rear extension bolt and cross member.



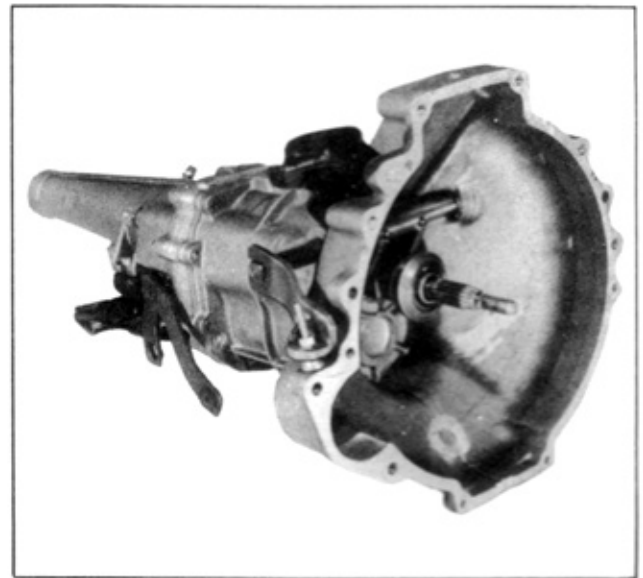
Pull out gradually to rear way after detaching the mounting.



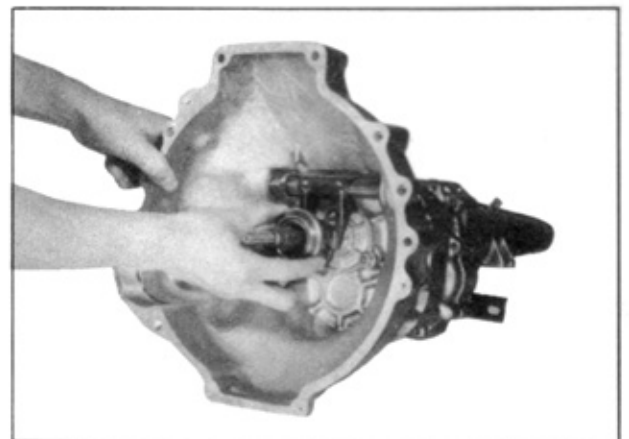
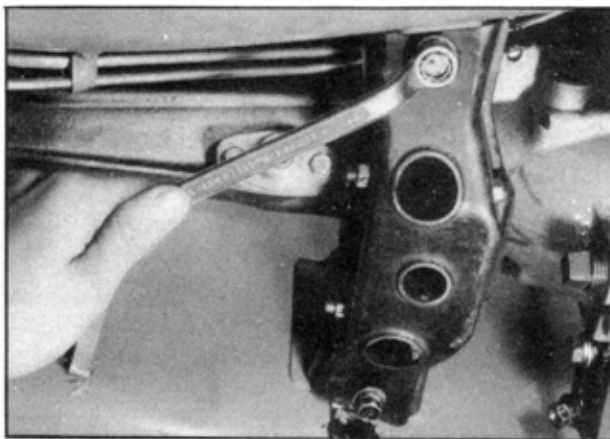
Mounting of transmission is a reversal of dismounting way.

## Disassembly

### A. The Case of Transmission

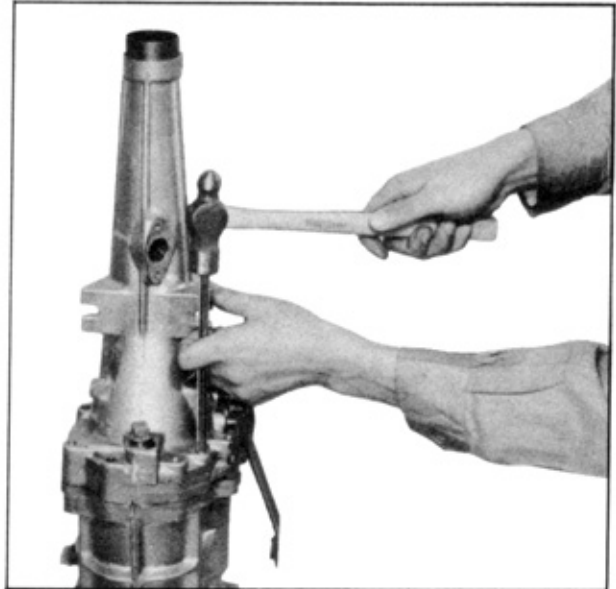
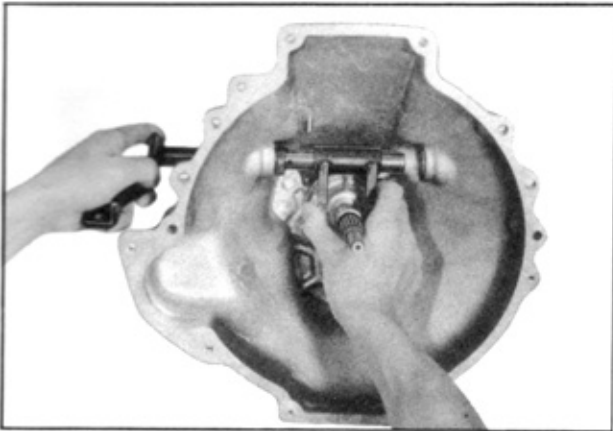


Take off the pinion sleeve of speedometer and pull out the pinion sleeve assembly.

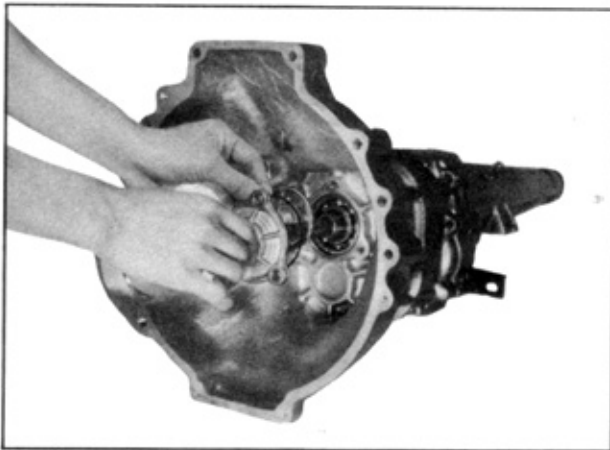


## DATSUN 1000

Detach the rear extension assembly from the adapter plate.



Separate the adapter plate with main shaft assembly and counter shaft complete from the transmission case. (To confirm the numbers of used washers at the front of counter shaft for reassembling case.)



Disconnect the holder spring of bearing sleeve at the release yoke and take out the sleeve with spring.

Knock out the release shaft after pulling the taper pin.

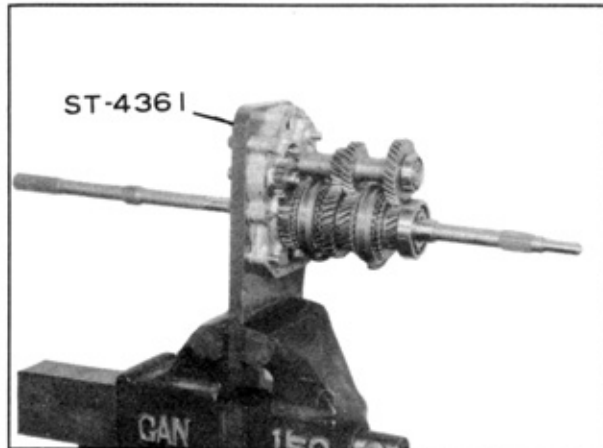
Take out the adjusting shims and "O" ring of front cover.

(To confirm numbers of used shims for reassembling case.)

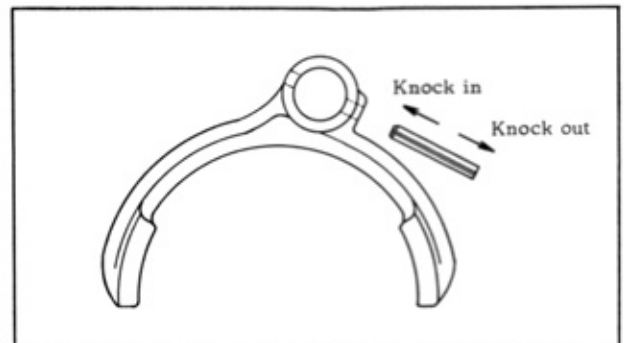
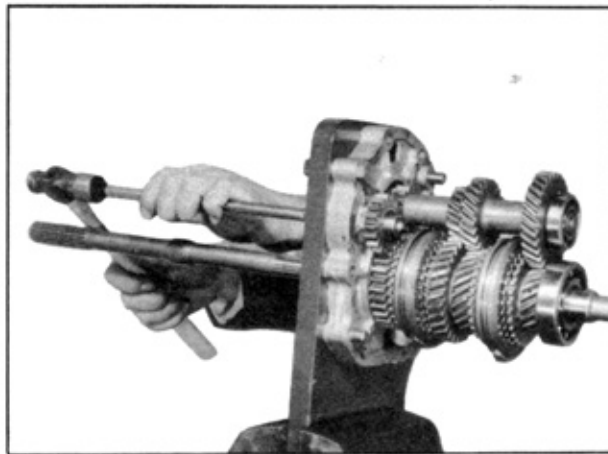
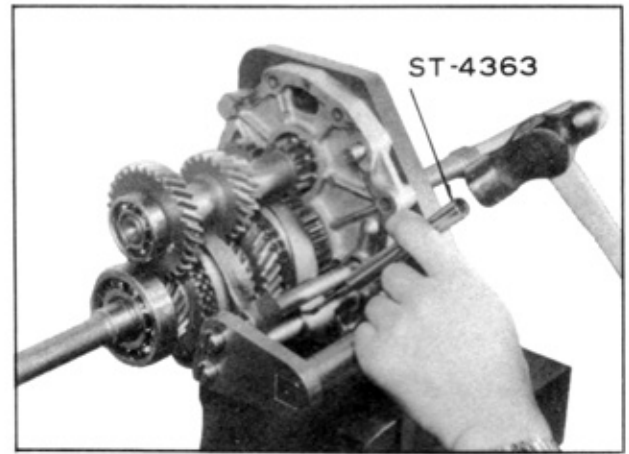


## B. Main Shaft

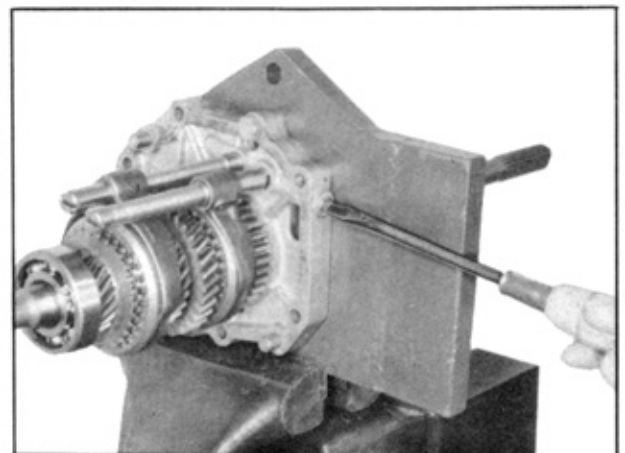
Fix the adapter plate with the counter shaft assembly and the main shaft assembly as shown the figure.



Fix the adapter plate assembly on the bench as shown the figure and knock out the retaining pins from the boss by tool. (ST-4363)



Take out check ball and spring from the plug.



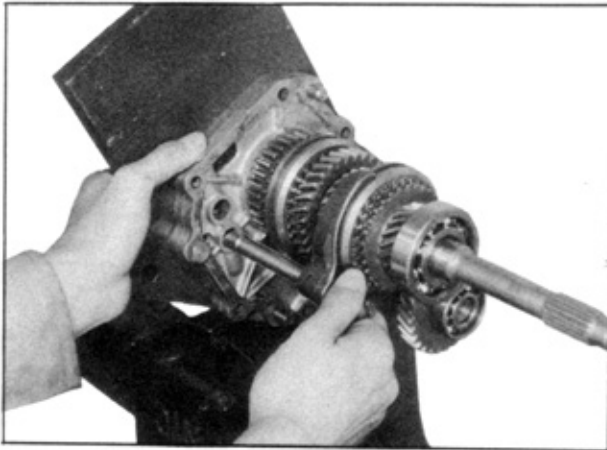
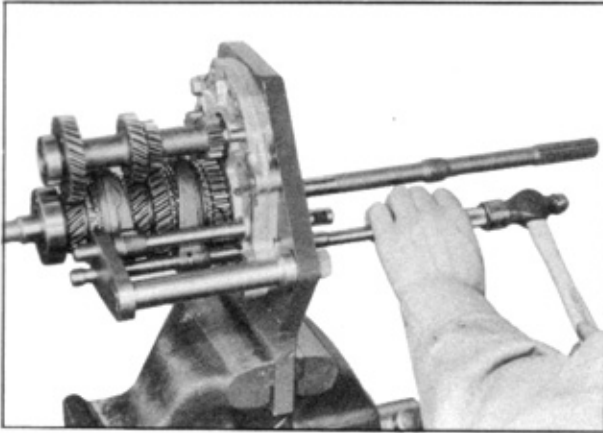
Detach the snap ring (2) at the reverse idler shaft and tap out the shaft by the brass bar.

Detach the reverse idler gear and thrust washer (2) from shaft at neutral position.

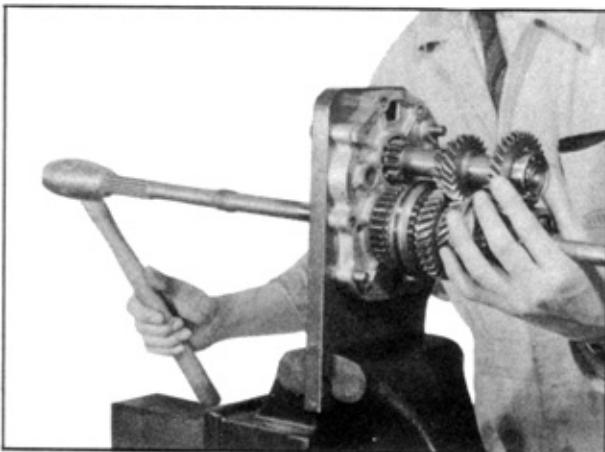


# DATSUN 1000

Detach low, reverse and speed fork rod by the brass bar.



Disassemble inter lock plunger and pull out the second, third and speed fork.

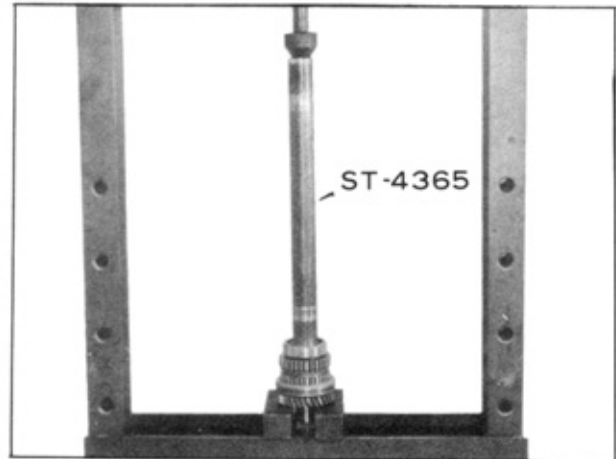


Detach the main shaft assembly and counter shaft complete from the adapter plate.

Separate the main drive gear and main shaft.

Detach the pilot bearing, synchro-hub thrust washer, steel ball, synchro-hub with cup ring sleeve, baulk ring, main shaft second gear and needle bearing etc. from the main shaft.

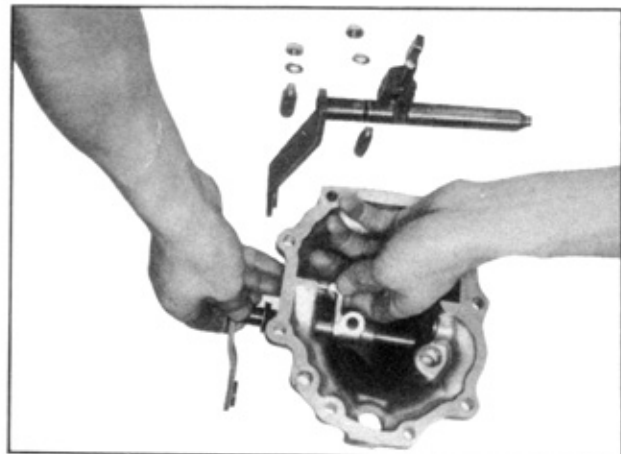
Take out main bearing washer, main bearing (rear side) from main shaft after detaching snap ring.



Draw out main shaft thrust washer, reverse speed gear, main shaft needle bearing, needle bearing spacer, reverse, speed, main shaft bush, synchro-hub with cup ring sleeve, baulk ring main shaft low gear, needle bearing spacer and main shaft needle bearing etc. from rear side.

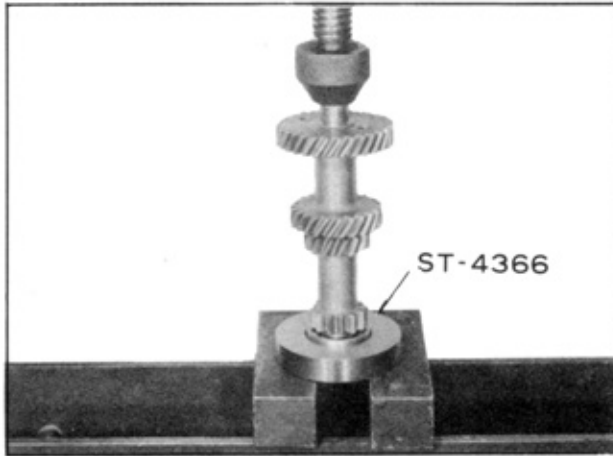
## C. Rear Extension

Disconnect the cotter pin of low reverse and second, third speed operating lever and take out operating lever by pulling the cross shaft out.

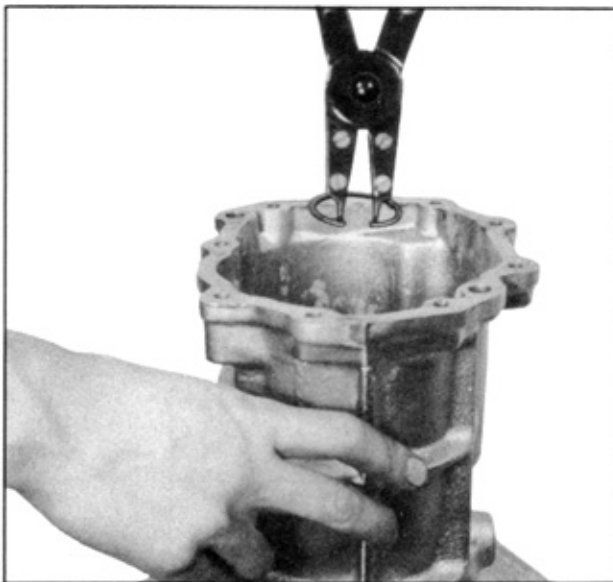


## Setting Counter Bearing Washer

- a) Press the ball bearings into front and rear of the counter gear cluster.



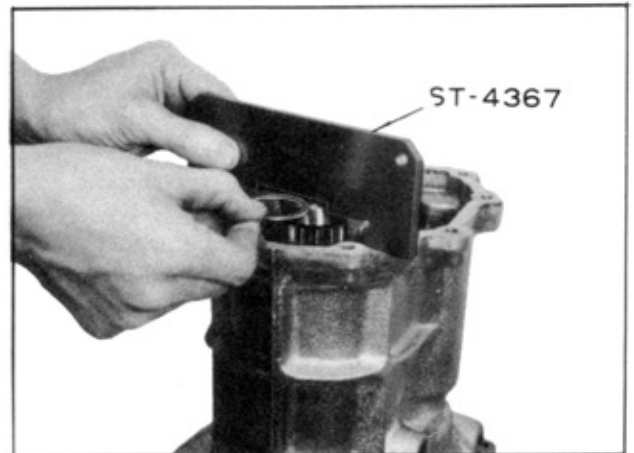
- b) Assemble the snap ring for the transmission case and set temporarily the counter gear cluster to the transmission case.



- c) The outer race should be inserted surely to close for snap ring and gauge the clearance for the bearing by a service tool.

## Counter-bearing washer

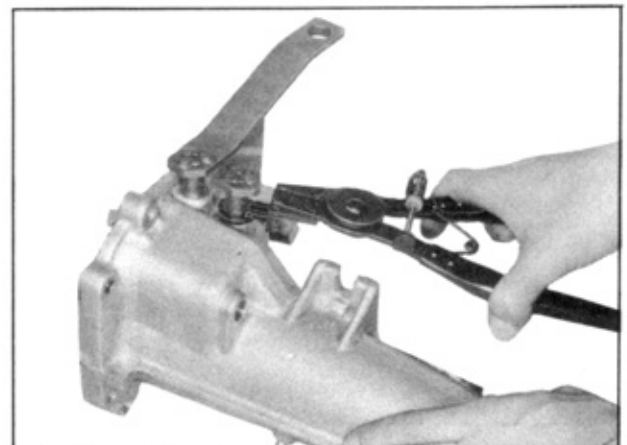
Part No.	Thickness mm
32224-18001	0.8
32224-18002	0.9
32224-18003	1.0
32224-18004	1.1
32224-18005	1.2
32224-18006	1.3



- d) Take out the counter gear cluster from transmission case after this decision

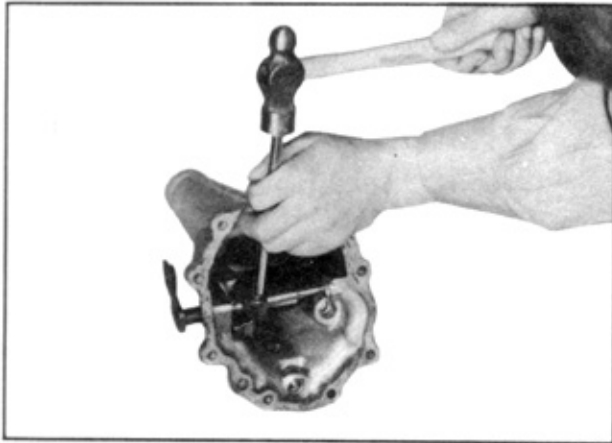
## Assembling the Rear Extension

- a) Insert the "E" ring, thrust washer and "O" ring to the second, third cross rod shaft.

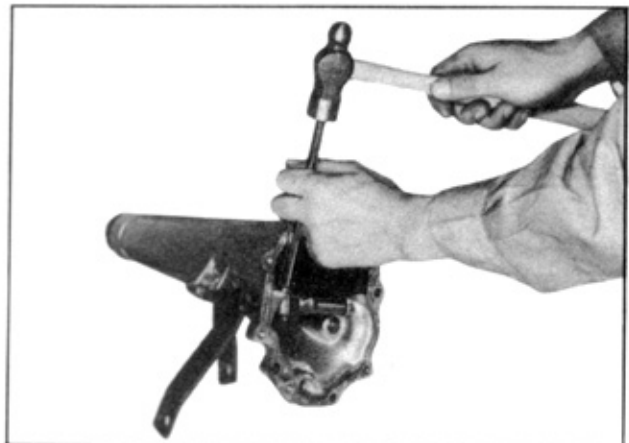


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b) Assemble the second, third speed operating lever to the cross shaft and lock with pin.

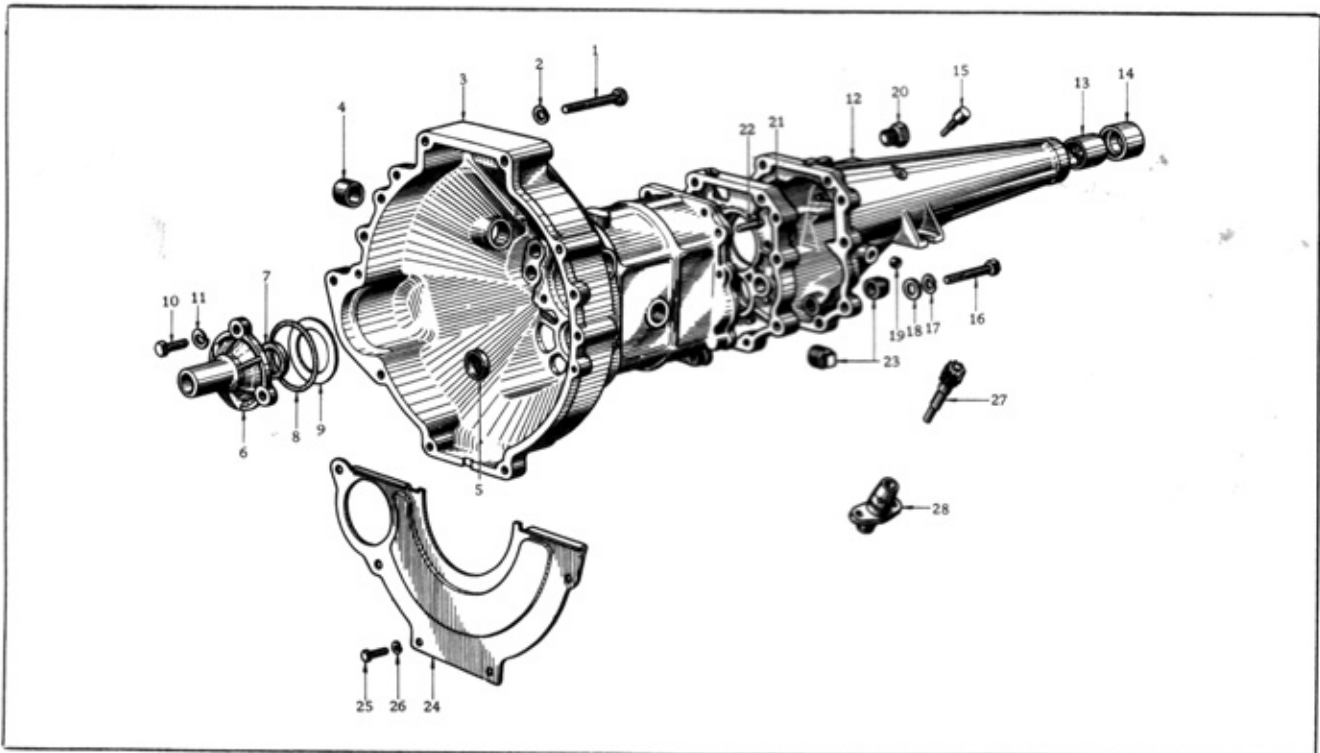


d) Assemble the first, reverse speed operating lever to this shaft.



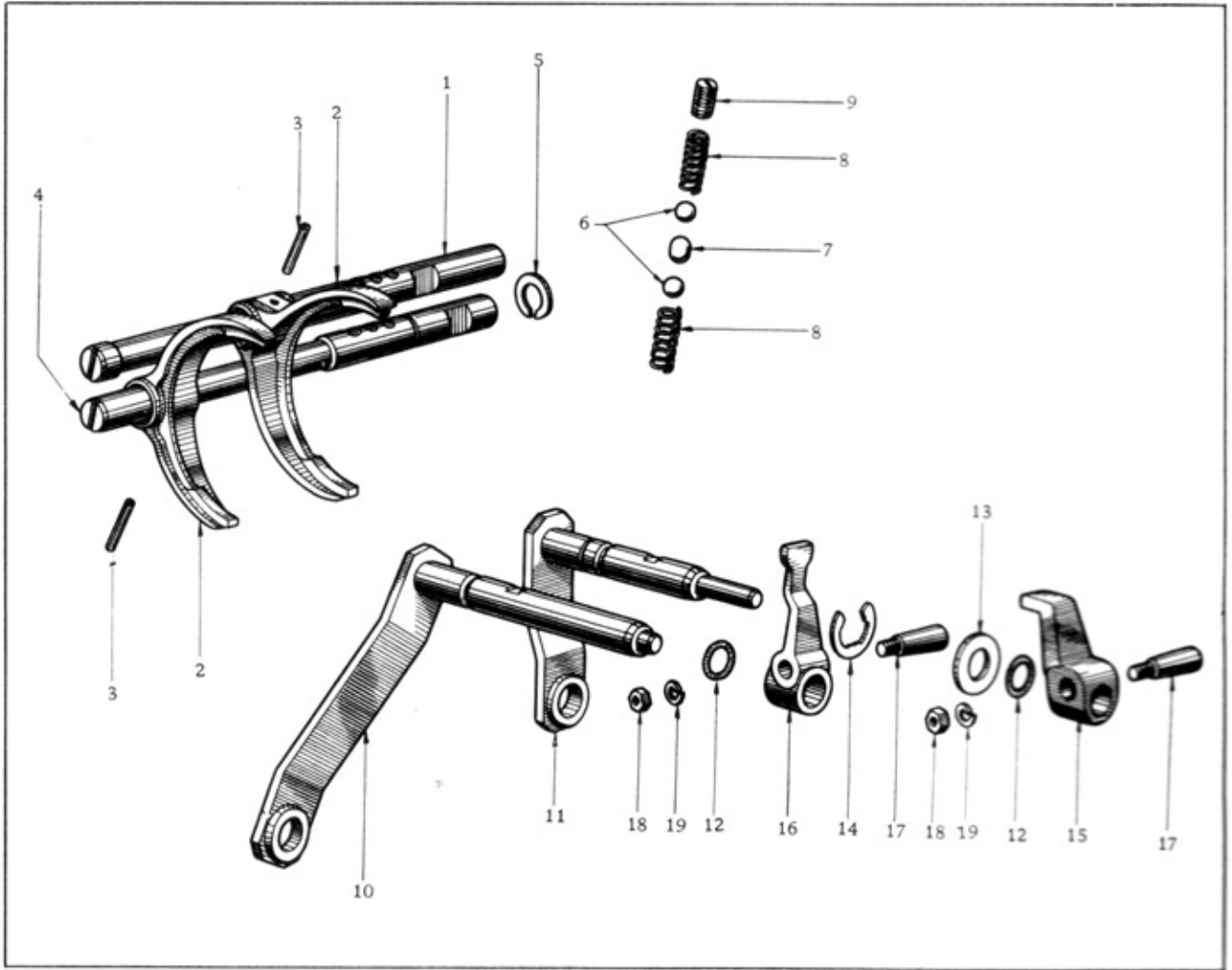
c) Put the "O" ring for the first, reverse speed cross shaft.

e) Knock and set the oil, seal for end of rear extension.



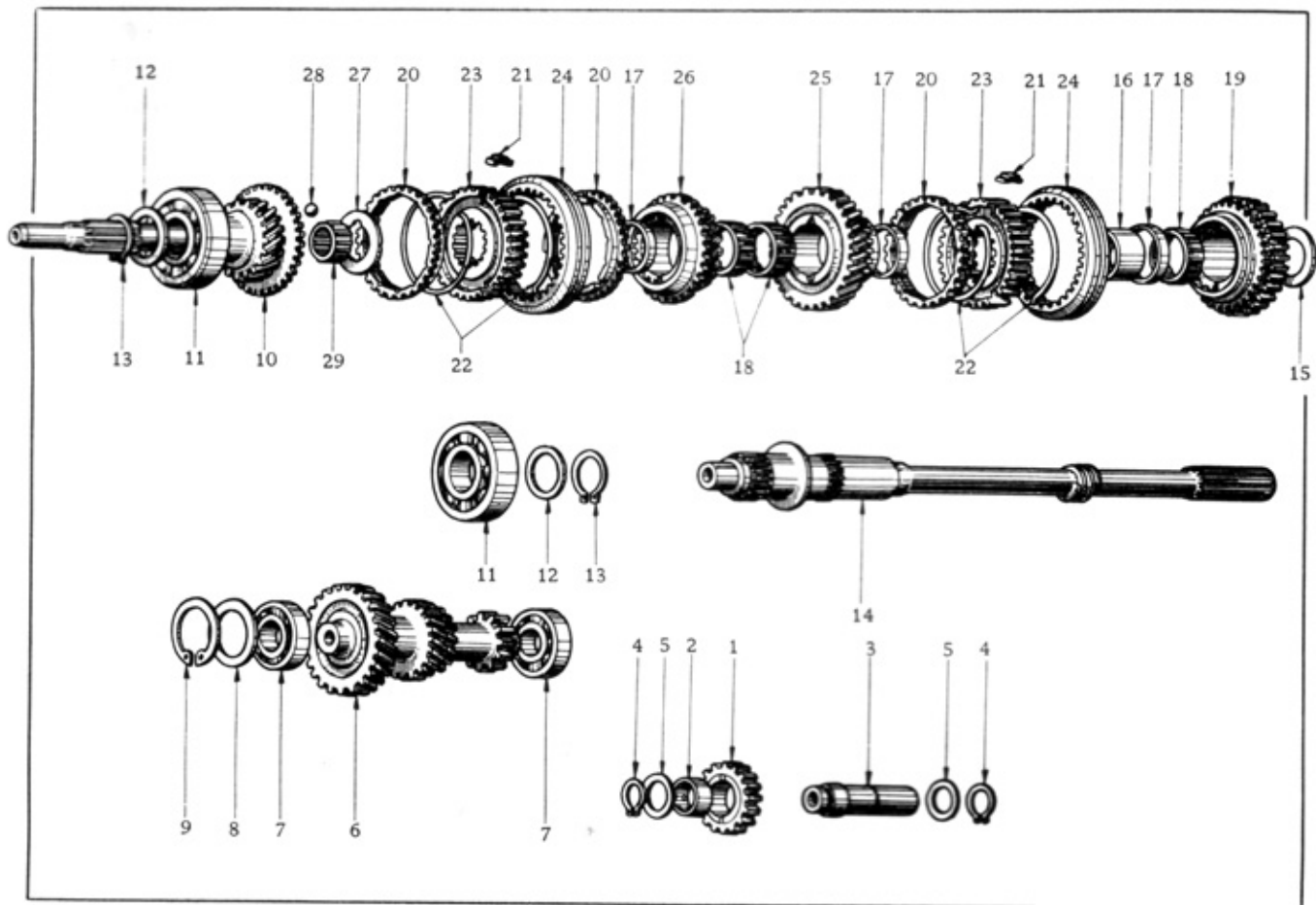
## Transmission Case & Rear Extension

1 Bolt	11 Washer-lock	21 Ass'y-plate, adapter
2 Washer-lock	12 Ass'y-extension, rear	22 Pin-dowel, rear extension
3 Comp. -case, transmission	13 Bush-rear extension	23 Plug
4 Bushing-clutch shaft	14 Seal-oil, rear extension	24 Cover-dust, clutch housing
5 Plug-welch	15 Ass'y-breather	25 Bolt
6 Ass'y-cover, transmission case	16 Bolt	26 Washer-lock
7 Seal-oil, front cover	17 Washer-lock	27 Ass'y-pinion, speedometer
8 Seal-oil, front cover	18 Washer-plain	28 Ass'y-sleeve, speedometer
9 Shim-adjusting, front cover	19 Plug-welch, rear extension	29 "O" ring-speedometer pinion
10 Bolt	20 Plug-reverse lamp switch	



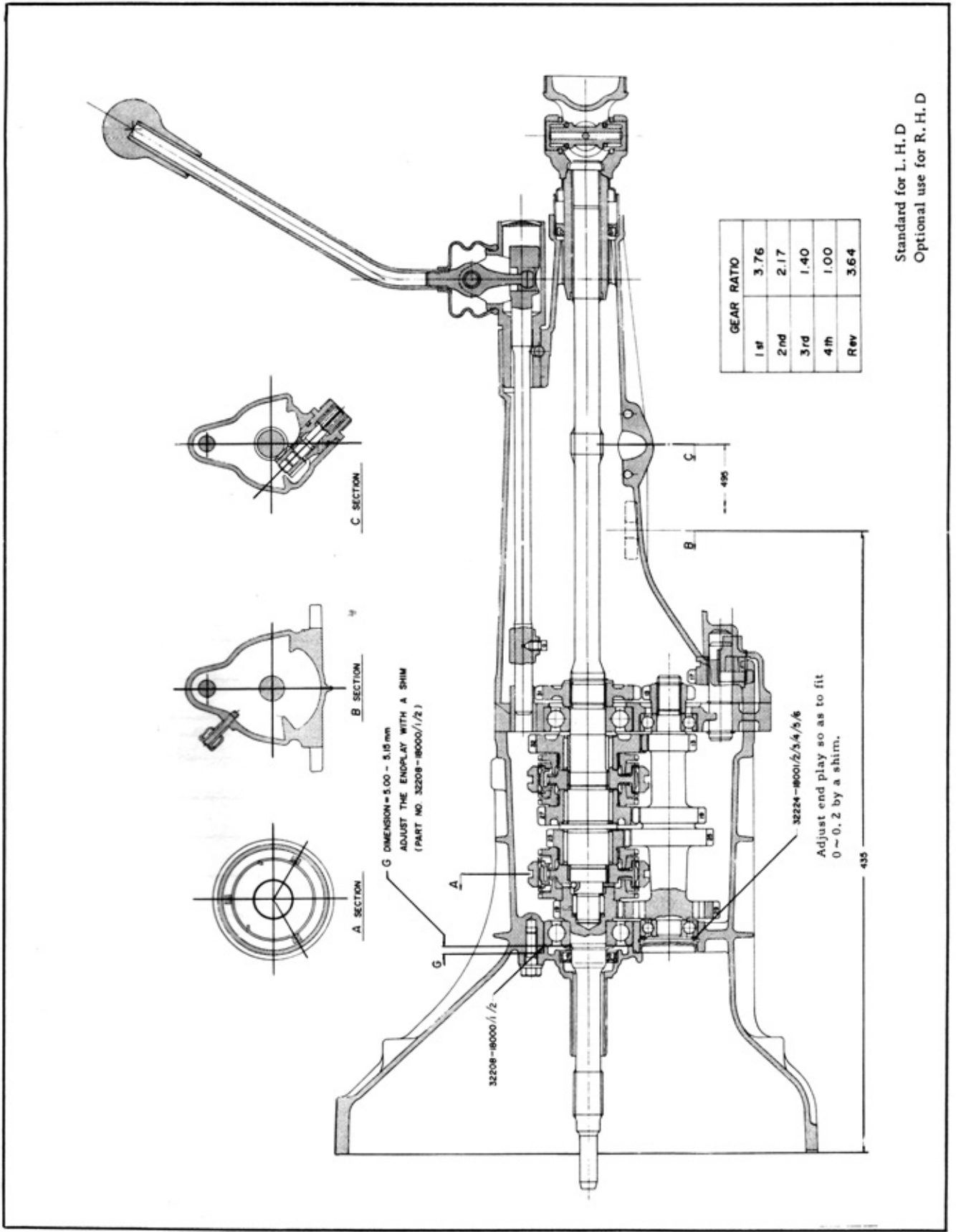
*Transmission Gear Shifting*

1	Rod-fork, reverse & 1st	11	Comp. -shaft, cross, 2nd & 3rd
2	Fork-shift	12	Ring-"O", cross shaft
3	Pin-retaining, fork	13	Washer-thrust, cross shaft
4	Rod-fork, 2nd & 3rd	14	Ring-"E", cross shaft
5	Ring-stopper	15	Lever-operating, 2nd & 3rd speed
6	Ball-checking	16	Lever-operating, 1st & reverse speed
7	Plunger-inter lock	17	Pin-retaining
8	Spring-checking ball	18	Nut
9	Plug-checking	19	Washer-lock
10	Comp. -shaft, cross, 1st & reverse		



*Transmission Gears*

1	Ass'y-gear, reverse idler	16	Bushing-main shaft, reverse gear
2	Bushing-gear, reverse idler	17	Spacer-needle bearing
3	Shaft-reverse idler	18	Bearing-needle, main shaft
4	Ring-snap, reverse idler	19	Ass'y-gear, reverse, main shaft
5	Washer-thrust, reverse idler	20	Ring-baulk
6	Ass'y-gear, counter	21	Insert-shifting
7	Bearing-ball, counter shaft	22	Spring-synchronizer
8	Washer-adjusting, counter bearing	23	Hub-synchronizer
9	Ring-snap, counter bearing	24	Sleeve-coupling
10	Ass'y-gear, main drive	25	Ass'y-gear, 1st speed
11	Bearing-ball, main shaft	26	Ass'y-gear, 2nd speed
12	Washer-main bearing	27	Washer-thrust, synchronizer hub
13	Ring-snap, main drive gear & main shaft	28	Ball-steel
14	Shaft-main	29	Bearing-pivot, main shaft
15	Washer-thrust, main shaft		

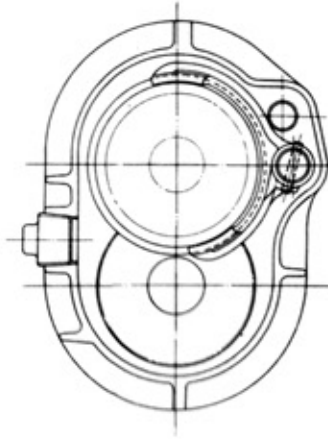
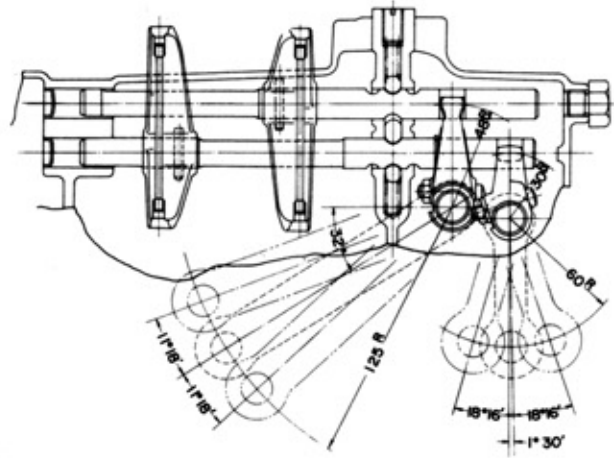


Standard for L. H. D  
 Optional use for R. H. D

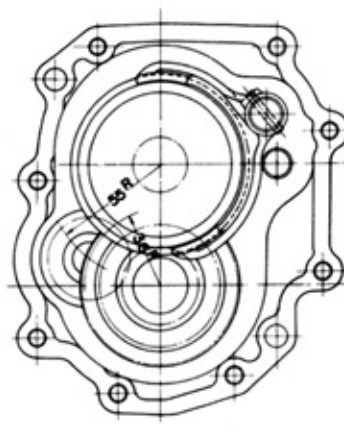
# DATSUN 1000



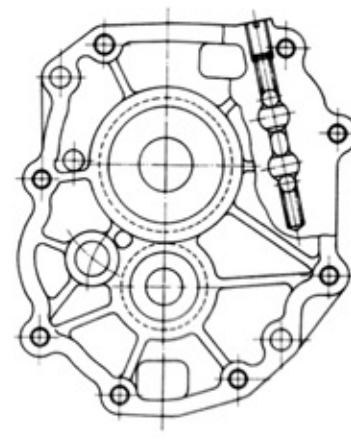
SECTIONAL VIEWS OF TRANSMISSION



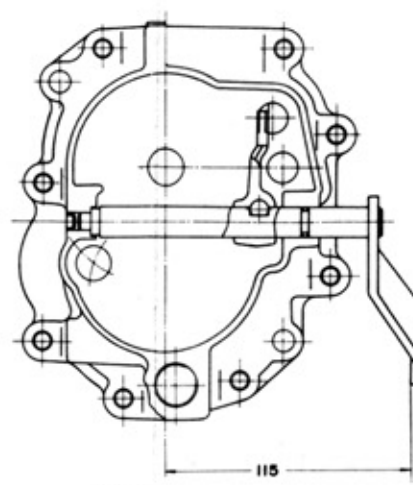
A - A SECTION



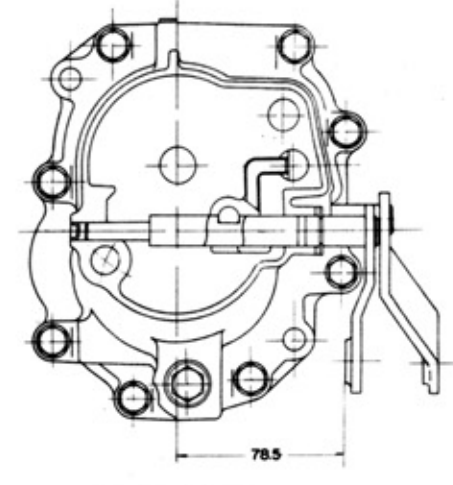
B - B SECTION



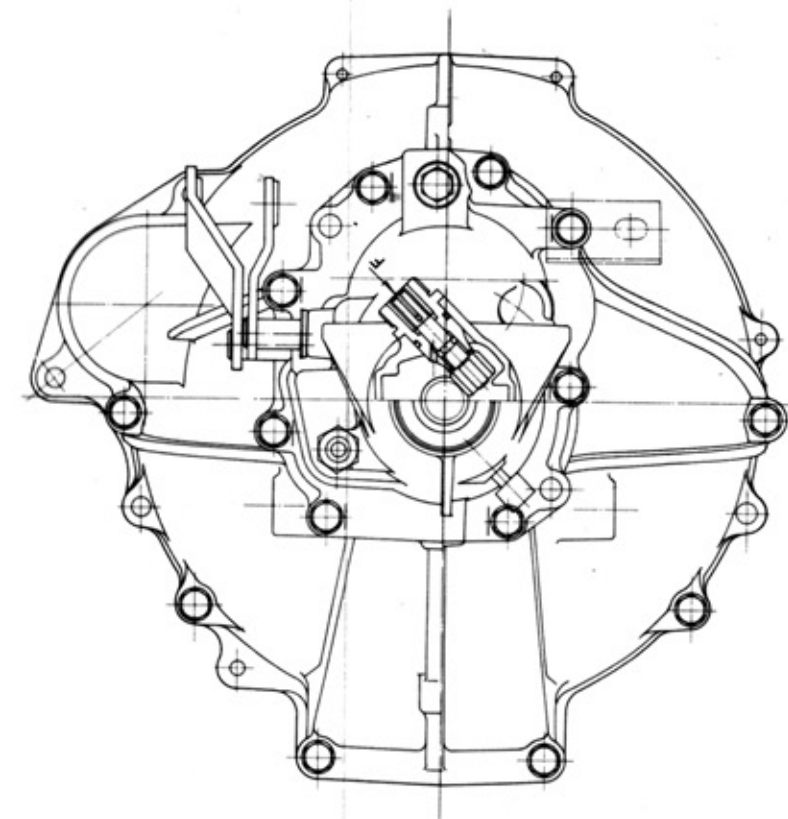
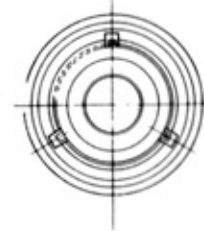
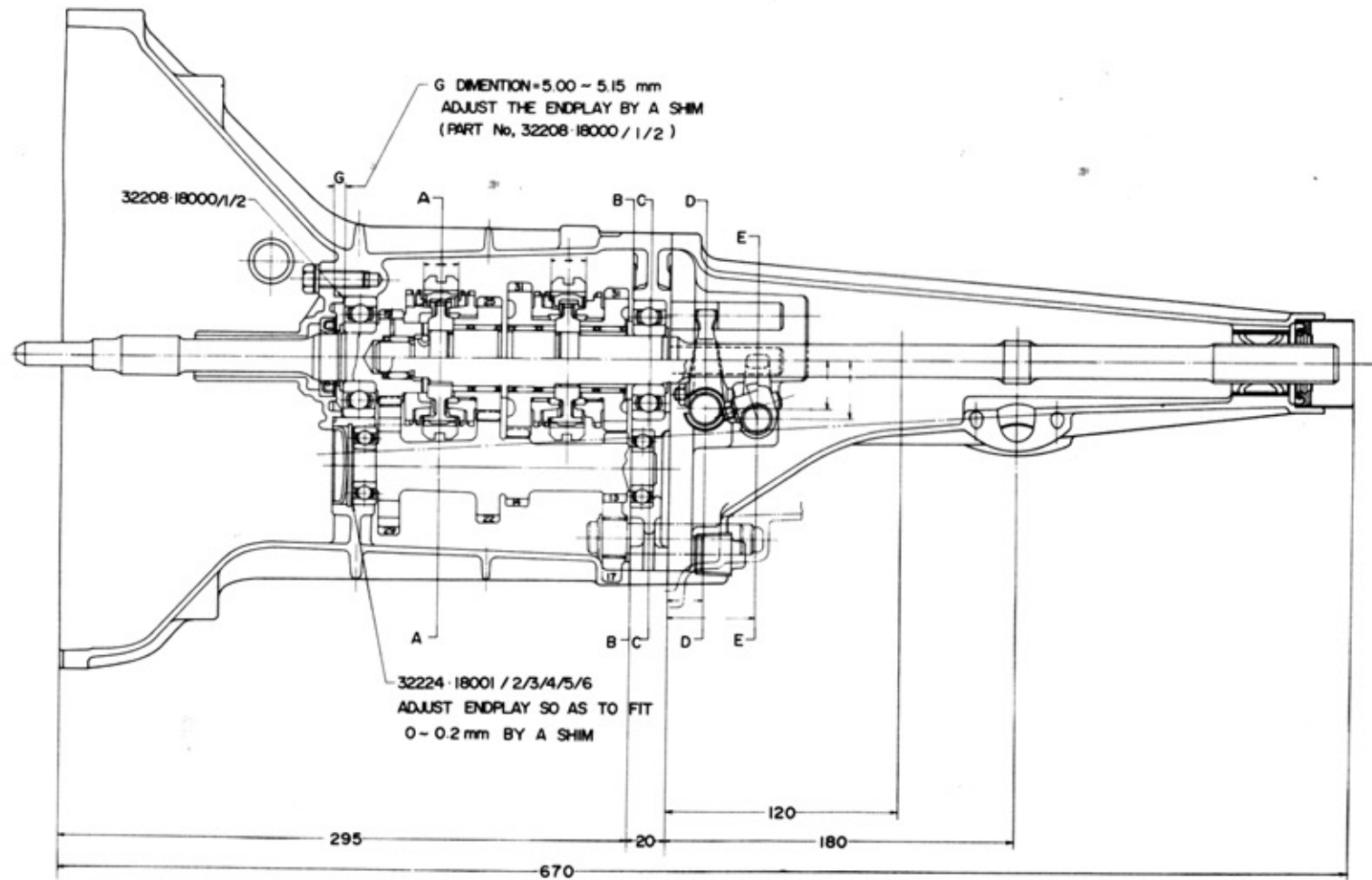
C - C SECTION



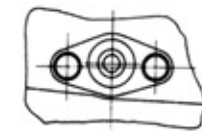
D - D SECTION



E - E SECTION



GEAR RATIO	
1 st	3.380
2 nd	1.734
3 rd	1.000
Rev.	3.640



F VIEW