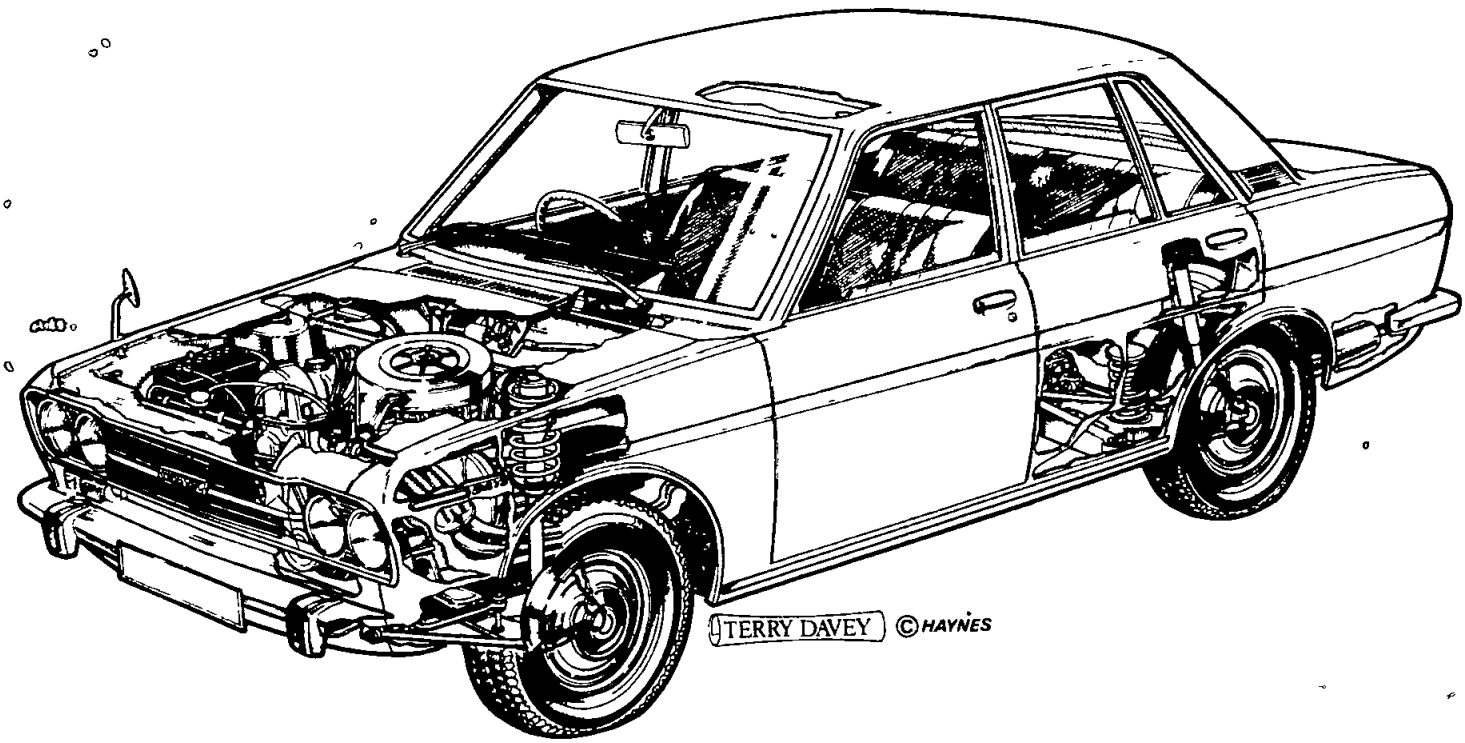
DATSUN 510 & PL521 PICK-UP

Covers 2 and 4 door Sedans, Wagon and li'l Hustler Pick-up



1968 to 1973 □ 97.3 cu in

Owner's Workshop Manual

by J. H. Haynes

Datsun Owners Workshop Manual

by J H Haynes
Associate Member of the Guild of Motoring Writers
and B L Chalmers-Hunt
TEng (CEI), AMIMI, AMIRTE AMVBRA

Models covered

UK Datsun 1300 Saloon, 1296 cc
Datsun 1400 Saloon, 1428 cc
Datsun 1600 Saloon and Estate, 1595 cc
USA Datsun PL 510 2 door Sedan, 97.3 cu in
Datsun PL 510 4 door Sedan, 97 3 cu in
Datsun WPL510 Wagon, 97.3 cu in
Datsun PL 521 Pickup (li'l Hustler), 97.3 cu in

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Stanley Randolph page edited the text

About this manual

The aim of this book is to help you get the best value from your car. It can do so in two ways First it can help you decide what work must be done, even should you choose to have it done by a garage, the routine maintenance and the diagnosis and course of action when random faults occur. But it is hoped that you will also use the second and fuller purpose by tackling the work yourself. This can give you the satisfaction of doing the job yourself. On the simpler jobs it may even be quicker than booking the car into a garage and going there twice, to leave and collect it Perhaps most important, much money can be saved by avoiding the costs a garage must charge to cover their labour and overheads

The book has drawings and descriptions to show the function of the various components so that their layout can be understood. The tasks are described in a step by step sequence so that even a novice can cope with complicated work Such a person is often the very one to buy a car needing repair, yet be unable to afford garage costs.

The jobs are described assuming only normal spanners are available, and not special tools. But a reasonable outfit of tools will be a worthwhile investment. Many special workshop tools produced by the manufacturer merely speed the work, and in these cases guidance is given as to how to do the job without them, the often quoted example being the use of a large hose clip to compress the piston rings for insertion in the cylinder. But on a very few occasions the special tool is essential, to prevent damage to components, then their use is described. Though it might be possible to borrow the tool, such work may have to be entrusted to the official Datsun dealer

To avoid labour costs a garage will often give a cheaper repair by fitting a reconditioned assembly The home mechanic can be helped by this book to diagnose the fault and make a repair using only a minor spare part The classic case is repairing a non functioning starter motor by fitting new brushes

The manufacturer's official workshop manuals are written for their trained staff, and so assume special knowledge, detail is left out This book is written for the owner, and so goes into such detail

The book is divided into twelve Chapters Each Chapter is divided into numbered sections which are headed in bold type between horizontal lines. Each section consists of serially numbered paragraphs.

Illustrations are numbered according to Chapter and sequence of occurrence in that Chapter.

Procedures, once described in the text, are not normally repeated. If it is necessary to refer to another Chapter the reference will be given in Chapter number and Section number thus Chapter 1/16.

If it is considered necessary to refer to a particular paragraph in another Chapter the reference is e g 'Chapter 1/5 5' Cross references given without the use of the word 'Chapter' apply to sections in the same Chapter, e.g. 'see Section 8' means also 'in this Chapter'

When the left or right side of a car is mentioned it is as if looking forward.

Great effort has been made to ensure that this book is complete and up to date The manufacturers continually modify their cars, even in retrospect.

Whilst every care is taken to ensure that the information in this manual is correct no liability can be accepted by the authors or publishers for loss, damage or injury caused by any errors in, or omissions from, the information given

Datsun 1600 Saloon

Datsun 1600 Estate (North American version)

Introduction to the Datsun

The range of vehicles dealt with in this manual is called the '510' series in North America and the 1300, 1400 or 1600 in the United Kingdom depending on its individual engine size Throughout this manual, therefore, the cars are simply known as the '510' series but are differentiated by body style and engine capacity as and when necessary

An analysis of the range is fairly simple for both markets, we have obviously found it possible to include both North American specification cars and UK cars in the same book without difficulty such is their basic similarity

Series	Model number	Serial prefix	Body style	Transmission
510	091	PL510	2 door saloon	Manual
510	092	PL510	2 door saloon	Automatic
510	094	PL510	4 door saloon	Manual
510	095	PL510	4 door saloon	Automatic
510	194	PL510	Wagon/Estate	Manual
510	195	PL510	Wagon/Estate	Automatic
521	395	PL521	Pick-up	Manual

The '510' saloon was first introduced to both markets late in 1968 but was not actually available in the UK until early the following year Production has stopped of all models except for the 2 door saloon (in USA) and the pick-up, now called L81 Hustler, although it is thought that the '510' saloon will soon stop

The series has been phenomenally successful in North America because the 'total package' was right As they were introduced in the UK before any deep market penetration had taken place by Datsun UK they were less of a success in numerical terms although they have paved the way for the now current 610/160 and 180 series

Simple in concept and conventional in construction they have a reputation of strength and economy - they also have some performance too if their racing success in America is anything to go by

(Some models are not available in both markets - the 1400 saloon is UK only, whilst the estate and pick-up are North American only)

As this book has been written in the United Kingdom it uses the appropriate English component names Some of these differ from those used in America Normally this causes no difficulty But to make sure, a glossary is printed below

Glossary

English	American
Anti-roll bar	Stabiliser or sway bar
Bonnet (engine cover)	Hood
Boot (luggage compartment)	Trunk
Bottom gear	1st gear
Bulkhead	Firewall
Clearance	Lash
Crownwheel	Ring gear (of differential)
Catch	Latch
Camfollower or tappet	Valve lifter or tappet
Cat's eye	Road reflecting lane marker
Circlip	Snap ring
Drop arm	Pitman arm
Drop head coupe	Convertible
Dynamo	Generator (DC)
Earth (electrical)	Ground
Estate car	Station wagon
Exhaust manifold	Header
Fault finding	Trouble shooting
Free play	Lash
Free wheel	Coast
Gudgeon pin	Piston pin or wrist pin
Gearchange	Shift
Gearbox	Transmission
Hood	Soft top
Hard top	Hard top
Half shaft	Axle shaft
Hot spot	Heat riser
Leading shoe (of brake)	Primary shoe
Layshaft (of gearbox)	Counter shaft
Mudguard or wing	Fender
Motorway	Freeway, turnpike etc
Paraffin	Kerosene
Petrol	Gas
Reverse	Back-up
Saloon	Sedan
Split cotter (for valve spring cap)	Lock (for valve spring retainer)
Split pin	Cotter pin
Sump	Oil pan
Silencer	Muffler
Steering arm	Spindle arm
Side light	Parking light
Side marker light	Cat's eye
Spanner	Wrench
Tappet	Valve lifter
Tab washer	Tang, lock
Top gear	High
Transmission	Whole drive line from clutch to axle shaft
Trailing shoe (of brake)	Secondary shoe
Track rod (of steering)	Tie rod (or connecting rod)
Windscreen	Windshield

Miscellaneous points

An 'Oil seal' is fitted to components lubricated by grease!

A 'Damper' is a 'Shock absorber' it damps out bouncing, and absorbs shocks of bump impact Both names are correct, and both are used haphazardly

Note that British drum brakes are different from the Bendix type that is common in America, so different descriptive names result The shoe end furthest from the hydraulic wheel cylinder is on a pivot, interconnection between the shoes as on Bendix brakes is most uncommon Therefore the phrase 'Primary' or 'Secondary' shoe does not apply A shoe is said to be Leading or Trailing A 'Leading' shoe is one on which a point on the drum, as it rotates forward, reaches the shoe at the end worked by the hydraulic cylinder before the anchor end The opposite is a trailing shoe, and this one has no self servo from the wrapping effect of the rotating drum

The word 'Tuning' has a narrower meaning than in America, and applies to that engine servicing to ensure full power The words 'Service' or 'Maintenance' are used where an American would say 'Tune-up'

Metric conversion tables

Inches	Decimals	Millimetres
1/64	0 015625	0 3969
1/32	0 03125	0 7937
3/64	0 046875	1 1906
1/16	0 0625	1 5875
5/64	0 078125	1 9844
3/32	0 09375	2 3812
7/64	0 109375	2 7781
1/8	0 125	3 1750
9/64	0 140625	3 5719
5/32	0 15625	3 9687
11/64	0 171875	4 3656
3/16	0 1875	4 7625
13/64	0 203125	5 1594
7/32	0 21875	5 5562
15/64	0 234375	5 9531
1/4	0 25	6 3500
17/64	0 265625	6 7469
9/32	0 28125	7 1437
19/64	0 296875	7 5406
5/16	0 3125	7 9375
21/64	0 328125	8 3344
11/32	0 34375	8 7312
23/64	0 359375	9 1281
3/8	0 375	9 5250
25/64	0 390625	9 9219
13/32	0 40625	10 3187
27/64	0 421875	10 7156
7/16	0 4375	11 1125
29/64	0 453125	11 5094
15/32	0 46875	11 9062
31/64	0 484375	12 3031
1/2	0 5	12 7000
33/64	0 515625	13 0969
17/32	0 53125	13 4937
35/64	0 546875	13 8906
9/16	0 5625	14 2875
37/64	0 578125	14 6844
19/32	0 59375	15 0812
39/64	0 609375	15 4781
5/8	0 625	15 8750
41/64	0 640625	16 2719
21/32	0 65625	16 6687
43/64	0 671875	17 0656
11/16	0 6875	17 4625
45/64	0 703125	17 8594
23/32	0 71875	18 2562
47/64	0 734375	18 6531
3/4	0 75	19 0500
49/64	0 765625	19 4469
25/32	0 78125	19 8437
51/64	0 796875	20 2406
13/16	0 8125	20 6375
53/64	0 828125	21 0344
27/32	0 84375	21 4312
55/64	0 859375	21 8281
7/8	0 875	22 2250
57/64	0 890625	22 6219
29/32	0 90625	23 0187
59/64	0 921875	23 4156
15/16	0 9375	23 8125
61/64	0 953125	24 2094
31/32	0 96875	24 6062
63/64	0 984375	25 0031

Millimetres to Inches

mm	Inches
0 01	0 00039
0 02	0 00079
0 03	0 00118
0 04	0 00157
0 05	0 00197
0 06	0 00236
0 07	0 00276
0 08	0 00315
0 09	0 00354
0 1	0 00394
0 2	0 00787
0 3	0 01181
0 4	0 01575
0 5	0 01969
0 6	0 02362
0 7	0 02756
0 8	0 03150
0 9	0 03543
1	0 03937
2	0 07874
3	0 11811
4	0 15748
5	0 19685
6	0 23622
7	0 27559
8	0 31496
9	0 35433
10	0 39370
11	0 43307
12	0 47244
13	0 51181
14	0 55118
15	0 59055
16	0 62992
17	0 66929
18	0 70866
19	0 74803
20	0 78740
21	0 82677
22	0 86614
23	0 90551
24	0 94488
25	0 98425
26	1 02362
27	1 06299
28	1 10236
29	1 14173
30	1 18110
31	1 22047
32	1 25984
33	1 29921
34	1 33858
35	1 37795
36	1 41732
37	1 4567
38	1 4961
39	1 5354
40	1 5748
41	1 6142
42	1 6535
43	1 6929
44	1 7323
45	1 7717

Inches to Millimetres

Inches	mm
0.001	0 0254
0.002	0 0508
0.003	0 0762
0 004	0 1016
0.005	0 1270
0 006	0 1524
0 007	0 1778
0 008	0 2032
0 009	0 2286
0 01	0 254
0 02	0 508
0 03	0 762
0 04	1 016
0 05	1 270
0 06	1 524
0 07	1 778
0 08	2 032
0 09	2 286
0 1	2 54
0 2	5 08
0 3	7 62
0 4	10 16
0 5	12 70
0 6	15 24
0 7	17 78
0 8	20 32
0 9	22 86
1	25 4
2	50 8
3	76 2
4	101 6
5	127 0
6	152 4
7	177 8
8	203 2
9	228 6
10	254 0
11	279 4
12	304 8
13	330 2
14	355 6
15	381 0
16	406 4
17	431 8
18	457 2
19	482 6
20	508 0
21	533 4
22	558 8
23	584 2
24	609 6
25	635 0
26	660 4
27	685 8
28	711 2
29	736 6
30	762 0
31	787 4
32	812 8
33	838 2
34	863 6
35	889 0
36	914 4

Spanner size equivalents

AF		Whit	Fits	Metric Equivalent	Metric size A/F* —	Inch Equivalent A/F*
4BA	0 248		9/64	6 3	7	0 276
2BA	0 32		3/16	8 1	8	0 315
					9	0.35
					10	0.39
7/16	0 44		1/4 UNF	11 2	11	0 413
	0 45	3/16	1/4 BSF	11 4	12	0 47
1/2	0 50		5/16 UNF	12 7	13	0 51
	0 53	1/4	5/16 BSF	13 5		
9/16	0 56		3/8 UNF	14 2	14	0 55
	0 604	5/16	3/8 BSF	15 3	15	0.59
5/8	0 63		7/16 Bolt	16	16	0 63
					17	0 67
11/16	0 69		7/16 Some nuts	17 5		
	0 72	3/8	7/16 BSF	18 3	18	0 71
3/4	0 76		1/2 UNF	19 3	19	0 75
					20	0 79
13/16	0 82			20.8		
	0 83	7/16	1/2 BSF	21 1	21	0.83
7/8	0 88		9/16 Some nuts	22 4	22	0 87
	0 93	1/2	9/16 BSF	23 6	23	0.91
15/16	0 94		5/8 UNF	23.8	24	0.945
					25	0.985
1"	1 01			25 6		
	1 02	9/16	5/8 BSF	25 9	26	1.02
1 1/16	1 07		5/8 Heavy UNF	27 2	27	1 06
	1 11	5/8	11/16 BSF	28 2	28	1 10
1 1/8	1 13		3/4 UNF	28 7	29	1 14
					30	1 18
	1 21	11/16	3/4 BSF	30 7	31	1 22
1 1/4	1 26		3/4 Heavy UNF	32 0	32	1 26
	1 31	3/4	7/8 BSF	33 3	33	1 3
1 5/16	1 32		7/8 UNF	33 5	34	1 34
					35	1 38
	1 49	7/8	1" BSF	37 8	36	1 42
					37	1 46

Contents

Ordering spare parts

Buy genuine Datsun spares from a Datsun dealer direct if you can If you go to an authorised dealer, genuine parts can usually be supplied from stock

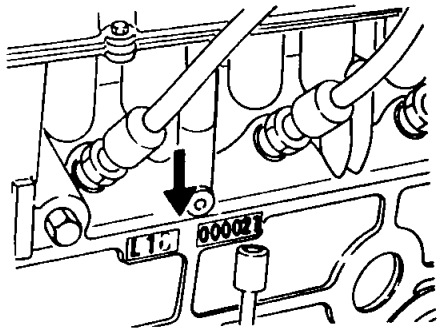
Always have details of the car, its serial and engine numbers available when ordering parts If you can take along the part to be renewed, it is helpful Modifications were continually being made and many were not publicised A storeman in a parts department is quite justified in saying that he cannot guarantee the correctness of a part unless these relevant numbers are available

The car identification plate is attached to the centre of the top of the bulkhead and is visible when the bonnet is fully open

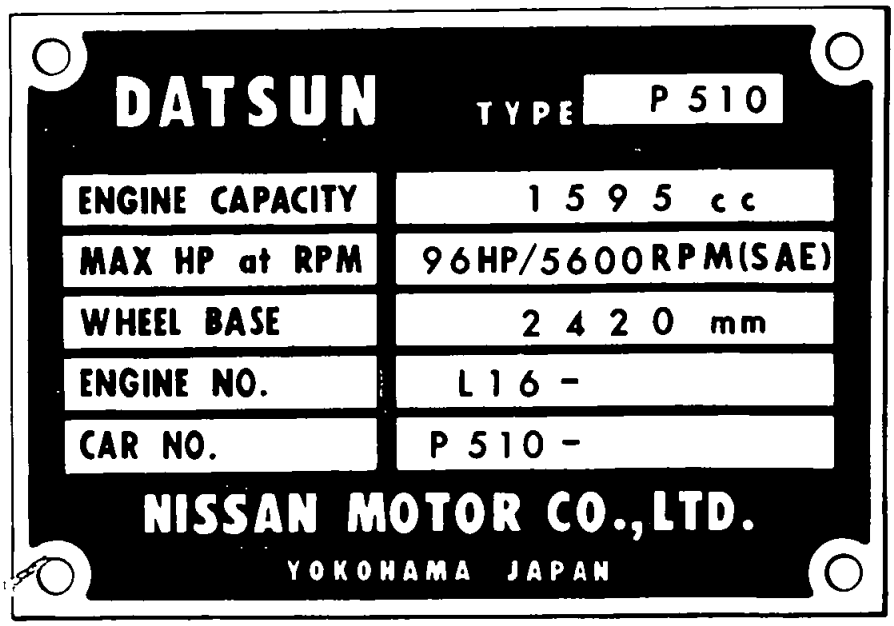
The car number is stamped on a plate which also is attached to the top of the bulkhead

The engine number is located on the rear right hand side of the cylinder block

When obtaining new parts remember that some assemblies may be exchanged This is very much cheaper than buying them outright and throwing the old part away. Before handing back an item in exchange always clean it to remove dirt and oil



Engine number location



Car identification plate

Routine maintenance

Introduction

1 In the schedule that follows this introduction is tabulated the routine servicing that should be done on the car This work has two important functions First is that of doing adjustments and lubrication to ensure the least wear and greatest efficiency But the second function, could almost be more important By looking your car over, on top and underneath, you have the opportunity to check that all is in order

2 Every component should be looked at, your gaze working systematically over the whole car Dirt cracking near a nut or a flange can indicate something loose Leaks will show Electric cables rubbing, rust appearing through the paint underneath, will also be found before they bring on a failure on the road, or a more expensive repair if not tackled quickly

3 The tasks to be done on the car are in general those recommended by the manufacturer We have also put in some additional ones For someone having his servicing done at a garage it may be more cost effective to accept component replacement after a somewhat short life, in order to avoid maintenance costs For the home mechanic this is not so The manufacturers must detail the work to be done as a careful balance of such factors Leaving it too long gives risk of defects occuring between the service checks Making intervals too frequent tempts owners into disrespect of their advice, to leave work undone disastrously long.

4 When you are checking the car, if something looks wrong, look it up in the appropriate Chapter If something seems to be working badly look in the fault finding section

5 Always road test after a repair, and inspect the work after it, and check nuts etc , for tightness Check again after about 150 miles.

Tools

1 The most useful type of spanner is a 'combination spanner' This has one end open jaw, the other a ring of the same size Alternatively a set of open ended and ring spanners will be required Wherever possible use a ring spanner as it will not slip off the bolt or nut especially when very tight Remember metric size tools are required

2 You will need a set of feeler gauges Preferably these should be metric sizes but if an imperial set are to hand the equivalents are quoted throughout this manual

3 You will see we specify tightening torques for nuts This needs an expensive torque wrench Many people get on well without them Contrariwise many others are plagued by things falling off or leaking from being too loose, whilst others suffer broken bolts, stripped threads, or, warped cylinder heads, because of overtightening

4 Torque wrenches use the socket of normal socket spanner sets. Sockets, with extensions and ratchet handles, are a boon In the meantime you will need box spanners for such things as cylinder head attachments, and the spark plugs They are thinner than sockets in small sizes, and will go where the latter cannot, so will always be useful even if later you plan to get sockets

5 Screwdrivers should have large handles for a good grip You need a large ordinary one, a little electrical one, and a medium cross-headed one Do not purchase one handle with interchangeable heads. The large screwdriver must have a tough handle that will take hitting with a hammer when you misuse it as a chisel

6 You can use an adjustable spanner and a self grip or pipe wrench of the Mole or Stillsons type

7 With these tools you will get by Do not purchase cheap ones but be prepared to spend a little extra They will last far longer

8 If you undertake major dismantling of the engine or transmission you will need a drift. This is a steel or soft metal rod about 3/8 inch in diameter Where possible use the steel drift which will withstand hammering. Do not use brass as little chips can fly off, unknowingly get into the component and ruin it You will need a 'ball pein' hammer, fairly heavy too, because it is easier to use gently, than a light one hard

9 Files are soon needed Four makes a good selection
- 6 inch half round smooth
- 8 inch flat second cut
- 8 inch round second cut
- 10 inch half round bastard.

10 You will need a good, firm, hydraulic jack A trolley jack is of major value when removing any of the manor units If you do ever get one, it must be in addition to, and cannot replace the simple jack, which is needed for the smaller jobs

11 The manufacturers base their own servicing operations on a 3,000 mileage basis Two free services are carried out on a new car at 600 miles and 2,000 miles A further small service is carried out at 4,000 miles and then the service scheme settles down to 3,000 mile intervals

12 The maintenance information given is not detailed in this Section as information will be found in the appropriate Chapters of this book.

13 Because of the Federal Regulations for exhaust emission several modifications have been made to the engine and ancillary equipment This equipment should not be tampered with unless absolutely necessary The car must then be taken to the local Datsun garage so that any adjustments necessary, as indicated by expensive electronic test equipment may be made In the following schedule these items are marked * Further information will be found in the relevant Chapters

Daily
- Check radiator coolant level
- Check engine oil level
- Check battery electrolyte level
- Check tyre pressures Examine tread depth and also for signs of other damage
- Check operation of all lights
- Check windscreen washer fluid level
- Check brake and clutch master cylinder reservoir hydraulic fluid level

First 4,000 mile (6,000 km) service - thereafter 3,000 miles (5,000 km)

1 Change engine oil

2 Check gearbox oil level and top up if necessary
3 Check rear axle oil level and top up if necessary
4 Check torque converter oil level and top up if necessary (Automatic transmission only)
5 Check fan belt tension.
6 Clean spark plugs and reset electrode gap
7 Check contact breaker points gap and reset as necessary Clean distributor cap and rotor arm
8 Check engine idling speed *
9 Check all fuel lines and joints for leakage Check tightness of all clips.
10 Clean air cleaner element with an air jet (paper element type only)
11 Check brake pipes and hoses for damage or leakage Also check handbrake linkage for security
12 Check steering linkage and attachments for security
13 Check disc brake friction pads for wear
14 Check ignition timing *
15 Check cooling system for leaks

6,000 mile (10,000 km) service

Carry out the following service items from the first 4,000 mile service, Nos. 1 to 15 inclusive except No 9, plus
16 Lubricate steering linkage (except '510')
17 Check steering gearbox oil level
18 Lubricate carburettor linkage, and accelerator pedal pivot
19 Lubricate distributor rotor shaft and contact breaker points arm pivot Grease distributor cam heel
20 Lubricate handbrake linkage, clutch and brake pedal pivots, (pick-up only)
21 Lubricate remote gearchange/selector linkage
22 Lubricate door hinges, bonnet and boot lid hinges and locks
23 Lubricate all grease nipples.
24 Change engine oil filter
25 Drain, flush and refill cooling system (except where Nissan Long Life Coolant is used)
26 Check tightness of cylinder head and manifold attachments
27 Check and clean fuel filter
28 Check and adjust valve clearances
29 Check tightness of battery connections Clean off corrosion and apply vaseline to terminals
30 Check operating efficiency of charging system
31 Clean oil filler cap (pick-up only)
32 Check front and rear suspension attachments for security
33 Check propeller shaft joints for wear
34 Check front wheel bearings for wear
35 Change roung wheels in diagonal manner, also using the spare to equalise tyre wear
36 Balance front wheels (Datsun garage)
37 Check front brake disc for wear or deep grooving
38 Generally check all electrical cables for damage and the connections for security
39 Check engine and transmission for oil leaks

9,000 mile (15,000 km) service

Carry out the service items in the first 4,000 mile service

12,000 mile (20,000 km) service

Carry out the following service items
Nos. 1 — 38 inclusive, except No s. 6, 9 and 16 plus
40 Change brake system hydraulic fluid
41 Fit new spark plugs.
42 Check tightness of engine mountings and all attachments
43 Check operation of starter motor and then tightness of all cable attachments
44 Test battery specific gravity
45 Check crankcase ventilation control valve for correct operation
46 Check correct function of transmission
47 Check operation and efficiency of shock absorbers Ensure mountings are secure
48 Check tightness of anti-roll bar attachments
49 Check tightness of door locks, catches and hinges
50 Check front wheel alignment (Datsun garage)
51 Remove brake drums, check linings and drum friction surfaces.
52 Check transmission mountings and attachments for security
53 Check steering gearbox mountings for security
54 Check operation of brake vacuum servo unit
55 Tune engine using electronic test equipment (Datsun garage) *
56 Check HT leads for damage and secure connections Check ignition LT leads for security
57 Check complete exhaust emission control system efficiency.*

15,000 mile (25,000 km) service

Carry out the service items in the first 4,000 mile service

18,000 mile (30,000 km) service

Carry out the service items in the 6,000 mile service

21,000 mile (35,000 km) service

Carry out the service items in the first 4,000 mile service

24,000 mile (40,000 km) service

Carry out the following service items
Nos 1, 4, 5, 8, 11, 12, 13, 14, 17 to 28, 29, 30, 32 to 38, 40 to 57 plus
58 Fit new fuel filter
59 Fit new air cleaner element
60 Check operation and output pressure of fuel pump
61 Use gauge to test cylinder compression pressures.
62 Clean carburettor float chamber and jets.
63 Check capacity of distributor condenser
64 Inspect exhaust system for corrosion and mountings for security
65 Check headlight alignment and adjust as necessary (Datsun garage)
66 Renew distributor contact breaker points

27,000 mile (45,000 km) service

Carry out the service items in the first 4,000 mile.

30,000 mile (50,000 km) service

Carry out the following service items
Nos. 1, 2, 4, 5 to 8, 10, 11, 12, 14, to 38, 46, 47 plus
67 Change rear axle oil
68 Change steering linkage and front suspension grease
69 Change propeller shaft joint grease.
70 Change wheel bearing grease.
71 Change cross shaft grease of transmission control system
72 Change drive shaft joint and ball spline grease
73 Check condition of engine mountings
74 Overhaul disc brake caliper
75 Check condition of suspension attachment rubber bushes

33,000 mile (55,000 km) service

Carry out the service items in the first 4,000 mile service.

36,000 mile (60,000 km) service

Carry out the service items in the 12,000 mile service

Other aspects of Routine maintenance

1 Jacking up

Always chock a wheel on the opposite side in front and behind The car's own jack has to be able to work when the car is very low with a flat tyre, so it locates under the sill (saloon models). On other models a special adaptor must be used on the jack for raising the front For the rear use the jack under the centre of the spring.

2 Wheel nuts

These should be cleaned and lightly smeared with grease as

necessary during work, to keep them moving easily. If the nuts are stubborn to undo due to dirt and overtightening, it may be necessary to hold them by lowering the jack till the wheel rests on the ground. Normally if the wheel brace is used across the hub centre a foot or knee held against the tyre will prevent the wheel from turning, and so save the wheels and nuts from wear if the nuts are slackened with weight on the wheel After replacing a wheel make a point later of rechecking the nuts again for tightness.

3 Safety

Whenever working, even partially, under the car, put an extra strong box or piece of timber underneath onto which the car will fall rather than onto you

4 Cleanliness

Whenever you do any work allow time for cleaning When something is in pieces or components removed to improve access to other areas, give an opportunity for a thorough clean This cleanliness will allow you to cope with a crisis on the road without getting yourself dirty During bigger jobs when you expect a bit of dirt it is less extreme and can be tolerated at least whilst removing a component When an item is being taken to pieces there is less risk of ruinous grit finding its way inside. The act of cleaning focuses your attention onto parts and you are more likely to spot trouble Dirt on the ignition parts is a common cause of poor starting. Large areas such as the engine compartment inner wings or bulkhead should be brushed thoroughly with a solvent like Gunk, allowed to soak and then very carefully hosed down Water in the wrong places, particularly the carburettor or electrical components will do more harm than dirt Use petrol or paraffin and a small paint-brush to clean the more inaccessible places.

5 Waste disposal

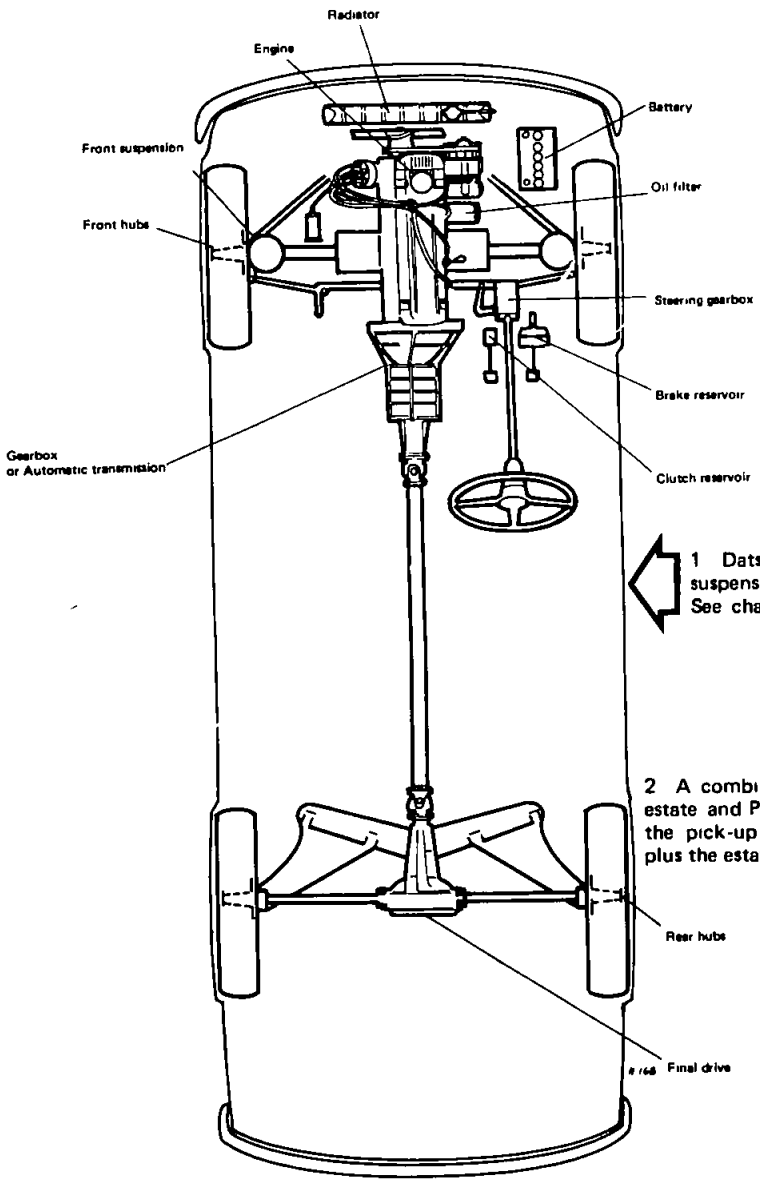
Old oil and cleaning paraffin must be destroyed Although it makes a good base for a bonfire the practice is dangerous It is also illegal to dispose of oil and paraffin down domestic drains By buying your new engine oil in one gallon cans you can refill with old oil and take back to the local garage who have facilities for disposal

6 Long journeys

Before taking the car on long journeys, particularly such trips as continental holidays, make sure that the car is given a thorough check in the form of the next service due, plus a full visual inspection well in advance so that any faults found can be rectified in time.

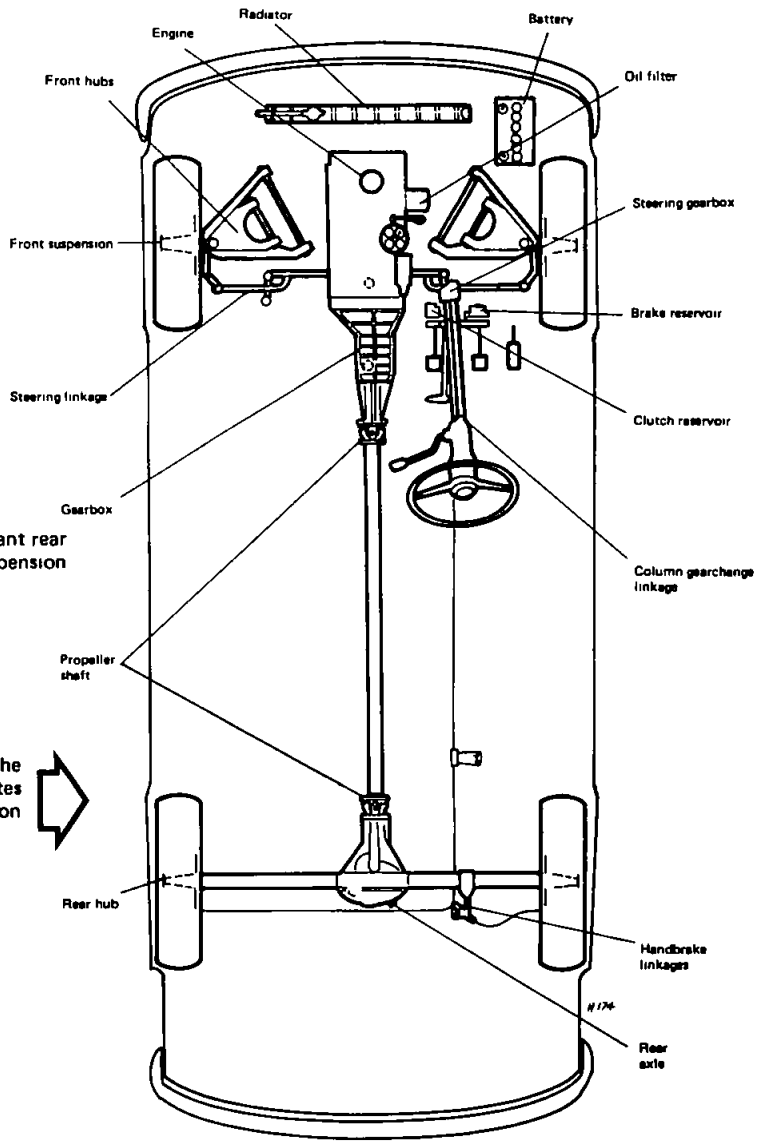
Recommended lubricants

Component	Grade	Castrol Grade
Engine	20W/50 Multigrade engine oil	CASTROL GTX
Manual Gearbox	Hypoid gear oil 90 EP	CASTROL HYPOY
Automatic Transmission	types BWL35 & 3N71A meets Borg-Warner specification types BWL41 & 3N71A meets General Motors specification	CASTROL TQF CASTROL TQ DEXRON®
Rear Axle/Differential	Hypoid gear oil 90 EP	CASTROL HYPOY B
Steering box	Hypoid gear oil 90 EP	CASTROL HYPOY
Drive shafts, wheel bearings, suspension joints	High melting point lithium based grease	CASTROL LM GREASE
Brake Fluid	Exceeds all required specifications	CASTROL GIRLING UNIVERSAL BRAKE AND CLUTCH FLUID
Cooling System	Glycol based anti-freeze mixed with appropriate quantity of water	CASTROL ANTI-FREEZE
All body fittings and general oiling	Thin universal oil	CASTROL EVERYMAN



1 Datsun saloons with independant rear suspension plus estate front suspension See chart No 2

2 A combination drawing showing the estate and Pick-up This chart illustrates the pick-up front end rear suspension plus the estate rear suspension



Chapter 1 Engine

Contents

Specifications

General	
Engine type	4 cylinder overhead camshaft (OHC)
Engine designation	L 13, L 14 or L 16
Firing order	1 3 4 2
Displacement	
L 13	1296cc (79 086 cu in)
L 14	1428cc (87 14 cu in)
L 16	1595cc (97 331 cu in)
Bore	3 2677 in (83 mm)
Stroke	
L 13	2 358 in (59 9 mm)
L 14	2 598 in (66 0 mm)
L 16	2.901 in (73 7 mm)
Engine idle speed	
Manual transmission	600 rpm
Automatic transmission	650 rpm
Compression ratio	8 5 1
Oil pressure	49 8 - 56 9 lb/in^2 (3 5 - 4 0)
	Engine warm and idling at 2000 rpm
Brake horse power	
L 13	77 at 6000 rpm
L 14	85 at 6000 rpm
L 16	96 at 5600 rpm
Maximum torque (at 3600 rpm)	
L 13	80.3 lb ft (11 1 kg m)
L 14	86 0 lb ft (11 9 kg m)
L 16	99.8 lb ft (13.8 kg m)
Standard compression pressure (at 350 rpm)	171 lb/in^2 (12 0 kg/cm^2)
Minimum compression pressure (at 350 rpm)	159 lb/in^2 (11.5 kg/cm^2)
Ignition timing (idle speed)	10° BTDC

Sump capacity (with filter)	8 2 pints (4 7 litres, 9 9 US pints)
(without filter	7 0 pints (4 0 litres, 8 4 US pints)
Cylinder head	
Type	Aluminium allow one piece
Valve clearance (warm)	
Inlet	0 0098 in (0 25 mm)
Exhaust	0 0118 in (0 30 mm)
Valve clearance (cold)	
Inlet	0 0079 in (0.20 mm)
Exhaust	0 0098 in (0 25 mm)
Valve seat width in cylinder head	
Inlet	0 055 - 0 071 in (1 40 - 1.80 mm)
Exhaust	0.063 - 0 079 in (1 60 - 2 00 mm)
Valve seat angle	45°
Valve seat insert interference fit in cylinder head	
Inlet	0 0031 - 0 0043 in (0 08 - 0 11 mm)
Exhaust	0 0024 - 0 0039 in (0 06 - 0 10 mm)
Cylinder head temperature for fitting valve seat inserts	150 - 200°C (302 - 392°F)
Valve guide interference fit in cylinder head	0 0011 - 0 0019 in (0 027 - 0 049 mm)
Cylinder head face warp limit	0 004 in (0 10 mm)
Valve head diameter	
Inlet	(L13, L16) 1 50 in (38 00 mm)
	(L14) 1 536 in (38 00 mm)
Exhaust	1 30 in (33 mm)
Stem diameter	0 31 in (8 mm)
Clearance in guide bore	
Inlet	0 0006 - 0 0018 in (0 015 - 0 045 mm)
Exhaust	0 0016 - 0 0028 in (0 040 - 0 070 mm)
Valve length	
Inlet	4 56 in (115 9 mm)
Exhaust	4 57 in (116 0 mm)
Valve lift	0 3937 in (10 0 mm)
Valve face angle	45° 30'
Valve spring type	Helical coil
Free length	
Outer L13	1 89 in (48 12 mm)
L14	1 929 in (49 mm)
L16	2 0472 in (52 00 mm)
Inner L13, L16	1 7657 in (44 85 mm)
L14	1 929 in (49 mm)
Valve guide type	Renewable
Length	2 32 in (59 0 mm)
Inner diameter	0 3150 - 0 3154 in (8 00 - 8 018 mm)
Outer diameter	0 4718 - 0 4723 in (11 985 - 11 996 mm)
Fitted height above cylinder head	0 409 - 0 417 in (10 4 - 10 6 mm)
Guide to valve stem clearance	
Inlet	0 0006 - 0 0018 in (0 015 - 0 045 mm)
Exhaust	0 0016 - 0 0028 in (0 040 - 0 070 mm)
Camshaft	
Camshaft type	Overhead
Number of bearings	4, steel backed white metal bush
Camshaft journal diameter	1 8877 - 1 8883 in (47 949 - 47 962 mm)
Camshaft journal wear limit	0 0039 in (0 10 mm)
Camshaft bearing diameter	1 8898 - 1 8904 in (48 00 - 48 016 mm)
Camshaft lobe lift	0 261 in (6 65 mm)
Camshaft journal to bearing clearance	0 0015 - 0 0028 in (0 038 - 0 076 mm)
Bearing clearance limit	0 0039 in (0 10 mm)
Camshaft end float	0 0031 - 0 0150 in (0 08 - 0 38 mm)
Camshaft distortion (maximum)	0 002 in (0 05 mm)
Camshaft drive type	Sprocket and chain
Camshaft sprocket attachment	Dowel and bolt
Crankshaft sprocket attachment	Key
Crankshaft	
Type	Forged steel counter balanced
Number of main bearings	5, steel shell, white metal lined
End thrust taken at	No 3 main bearing
Thrust clearance	0 002 - 0 006 in (0 05 - 0 15 mm)
Max thrust clearance	0 012 in (0 3 mm)
Main bearing journal diameter	2 1631 - 2 1636 in (54 942 - 54 955 mm)
Main bearing journal ovality and taper (Max)	0 0012 in (0.03 mm)

Undersizes (approx – use metric)	
1st	0 010 in (0.250 mm)
2nd	0 020 in (0 500 mm)
3rd	0 030 in (0 750 mm)
4th	0 040 in (1 000 mm)
Main bearing clearance L 13	0 0008 - 0.0024 in (0 020 - 0.062 mm)
Main bearing clearance (Max)	0 0039 in (0 10 mm)
Crankpin diameter	1 9670 - 1 9675 in (49 961 - 49 975 mm)
Crankpin ovality and taper (Max)	0 0012 in (0 03 mm)
Connecting rods and bearings	
Type	'H' section Forged steel, steel shell white metal lined bearing
Length (centre to centre)	
L 13	5.507 - 5 509 in (139.87 - 139 93 mm)
L 14	5 35 in (136 6 mm)
L 16	5 235 - 5 237 in (132 97 - 133 03 mm)
Big end bearing clearance	0 0006 - 0 0022 in (0 014 - 0 056 mm)
Big end bearing clearance (Max)	0 0039 in (0 10 mm)
Undersizes (approx – use metric)	
1st	0 002 in (0 060 mm)
2nd	0 004 in (0 120 mm)
3rd	0 010 in (0 250 mm)
4th	0 020 in (0 500 mm)
5th	0 030 in (0 750 mm)
6th	0 040 in (1 00 mm)
Pistons and rings	
Type	
L 13, L14	Flat top Invar strut, Slipper skirt Cast aluminium
L 16	Concave top Invar strut, Slipper skirt Cast aluminium
Diameter	
Standard	3 267 - 3 269 in (82 99 - 83 04 mm)
1st O S	3 276 - 3 278 in (83 22 - 83 27 mm)
2nd O S	3 286 - 3 288 in (83 47 - 83 52 mm)
3rd O S	3 296 - 3 298 in (83 72 - 83 77 mm)
4th O S	3 305 - 3 308 in (83 97 - 84 02 mm)
5th O S	3 326 - 3 328 in (84 47 - 84 52 mm)
Skirt clearance in bore	0 001 - 0 0018 in (0 025 - 0 045 mm)
Gudgeon pin bore offset	0 0374 - 0 04134 in (0 950 - 1 050 mm)
Number of rings	3 (2 compression, 1 oil control)
Width	
Upper compression	0 078 in (2 0 mm)
Lower compression	0 078 in (2 0 mm)
Oil control	0 156 in (4 0 mm)
Clearance in grooves	
Upper compression L 13	0 0016 - 0 029 in (0 040 - 0 073 mm)
L 14	0 009 - 0 015 in (0 23 - 0 38 mm)
L 16	0 0018 - 0 0031 in (0 045 - 0 078 mm)
Lower compression	0 0012 - 0 0025 in (0 030 - 0 063 mm)
Oil control	0 001 - 0 0025 in (0 025 - 0 063 mm)
Ring gap	
Upper compression	0 0091 - 0 015 in (0 023 0 38 mm)
Lower compression	0 0059 - 0 01118 in (0 15 - 0 30 mm)
Oil control	0 0059 - 0 0118 in (0 15 - 0 30 mm)
Gudgeon pins	
Type	Interference fit in connecting rod
Length	2 8346 - 2 8445 in (72 00 - 72 25 mm)
Diameter	0 8266 - 0 8268 in (20 995 - 21 000 mm)
Piston clearance	0 0003 - 0 0004 in (0 008 - 0 010 mm)
Interference fit in connecting rod	0 0006 - 0 0013 in (0 015 - 0 033 mm)
Cylinder block	
Type	4 cylinder in line Cylinder block integral with crankcase
Bore diameter (standard)	3 2677 - 3 2697 in (83 000 - 83 050 mm)
Bore wear limit	0 008 in (0 20 mm)
Bore measurement points (from face of block)	
1st	0 787 in (20 mm)
2nd	2 362 in (60 mm)
3rd	3 937 in (100 mm)
Cylinder block face warp limit	0 004 in (0 10 mm)
Oversize piston sizes (approx – use metric)	
1st O S	0 010 in (0 250 mm)

2nd O S	0.020 in (0.500 mm)
3rd O S	0 030 in (0 750 mm)
4th O S	0 040 in (1 000 mm)
5th O S	0 060 in (1 500 mm)

Oil pump	
Type	Trochoid, inner and outer rotors
Rotor to cover clearance	0 0012 - 0 0024 in (0 03 - 0 06 mm)
Rotor side clearance	0 0020 - 0 0047 in (0 05 - 0 12 mm)
Rotor tip clearance	less than 0 0047 in (0 12 mm)
Outer rotor to body clearance	0 0059 - 0.0083 in (0 15 - 0 21 mm)
Rotor to bottom cover clearance	0 0012 - 0.0051 in (0 03 - 0 13 mm)
Oil pressure at idle	11 - 40 lb/in^2 (0.8 - 2.8 kg/cm^2)
Regulator valve spring	
Free length	2 067 in (52 5 mm)
Pressure length	1.370 in (34.8 mm)
Regulator valve opening pressure	50 - 57 lb/in^2 (3 5 - 5 0 mm)

TORQUE WRENCH SETTINGS		**lb f ft**	**Kg f m**
Cylinder head bolts		43 4	6 0
Connecting rod big end nuts	(L 13, L16)	23 - 27	3 2 - 3.8
	(L 14)	33 - 40	4 5 - 5 5
Flywheel fixing bolts		101 - 116	14 - 16
Main bearing cap bolts		33 - 40	4 5 - 5 5
Camshaft sprocket bolt		86.8 - 116	12 - 16
Oil sump bolts		4 3 - 6 5	0 6 - 0 9
Oil pump bolts		8 0 - 10 8	1 1 - 1 5
Oil sump drain plug		14 5 - 21 7	2 0 - 3 0
Rocker pivot lock nuts		36 2 - 43 4	5 0 - 6 0
Camshaft locating plate bolts		4 3 - 6 5	0 6 - 0.9
Carburettor nuts		26 - 52	3 6 - 7.2
Manifold nuts		5 8 - 8 7	0.8 - 1.2
Fuel pump nuts		8 7 - 13 0	1 2 - 1 8
Crankshaft pulley bolts		86.8 - 115 7	12 0 - 16 0
Rear engine mounting to transmission bolts		23 0	3 2
Rear engine mounting to crossmember bolts		12 0	1 6
Rear crossmember to body bolts		38 0	5 2
Front engine mounting bracket to engine bolts		22 0	3 0
Front engine mounting to bracket bolts		23 0	3 2
Front engine mounting to crossmember		12 0	1 7
Oil pump cover bolts		5 1 - 7 2	0 7 - 1 0
Cap nut - regulator valve		26 - 29	4 - 5

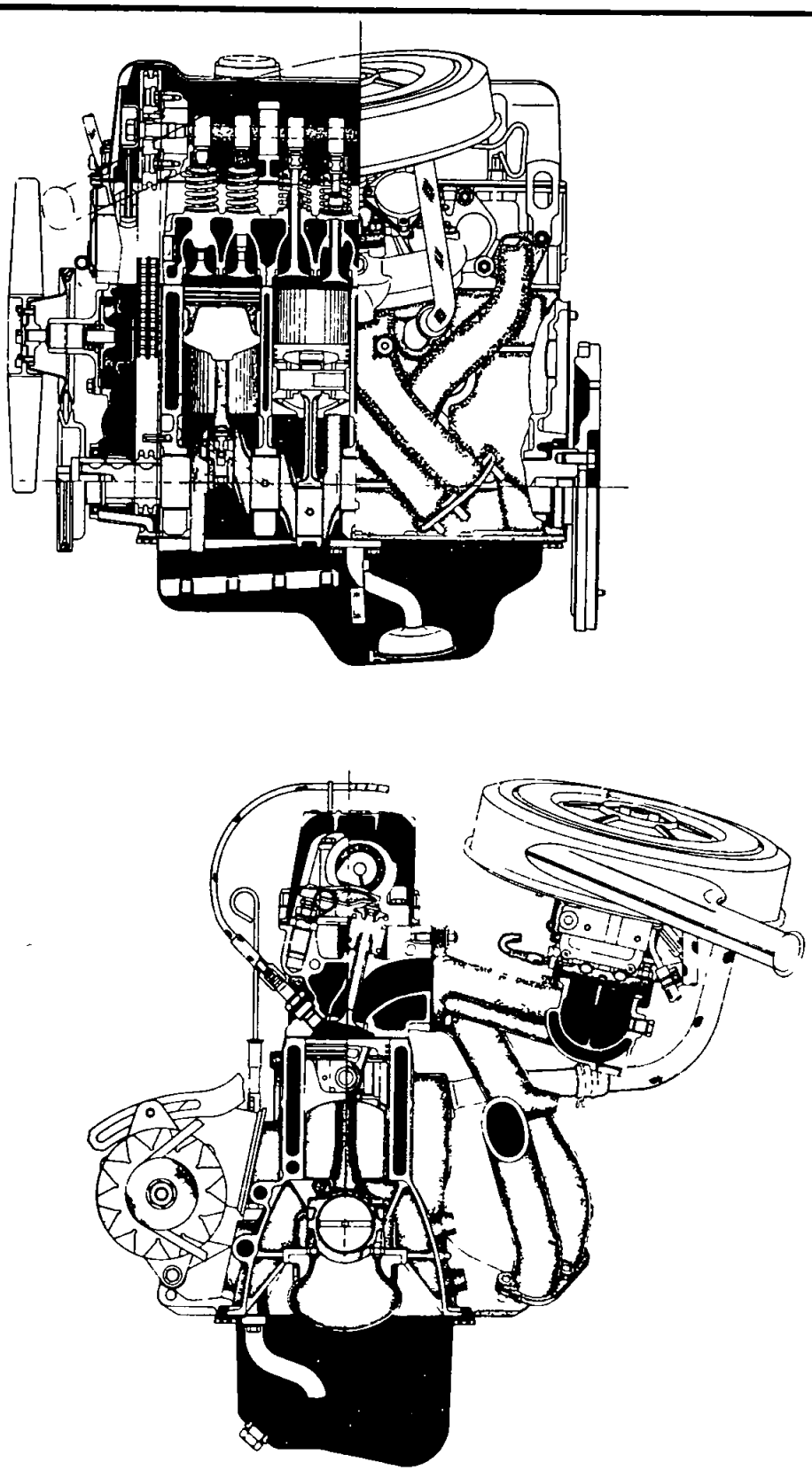


Fig.1.1 Cross sectional views of engine

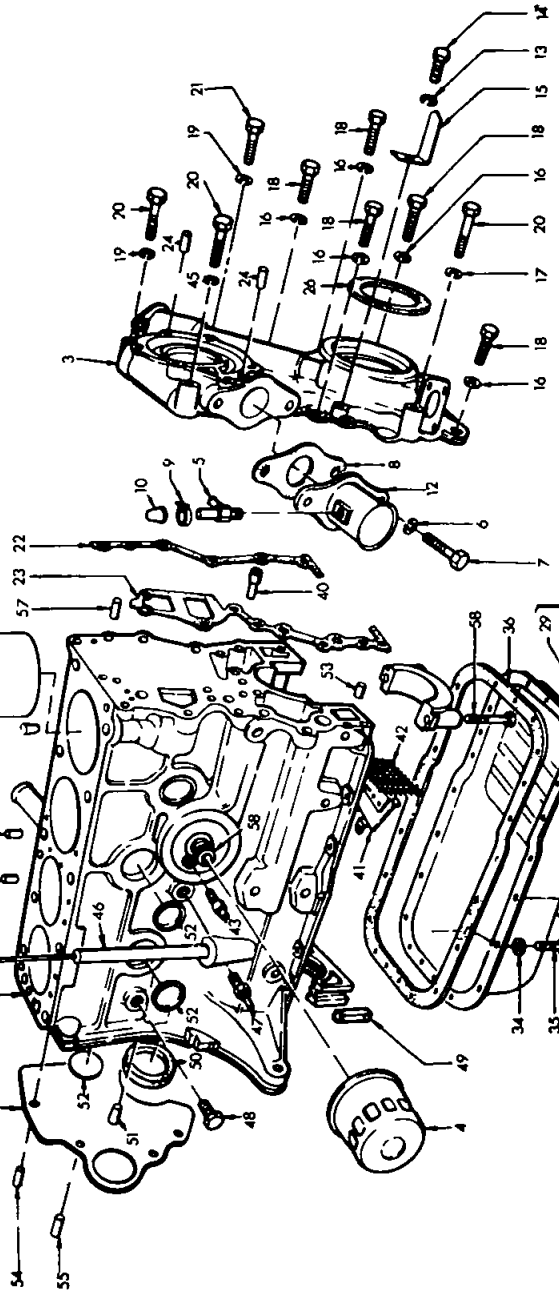


FIG 1 2 CYLINDER BLOCK, SUMP AND FRONT COVER ASSEMBLIES

1 Block cylinder liner
2 Block cylinder liner
3 Front engine cover
4 Oil filter cartridge
5 Connector
6 Lockwasher spring
7 Bolt
8 Inlet water gasket
9 Hose clamp
10 Rubber cap
11 Rubber cap
12 Water inlet
13 Lock washer spring
14 Indicator bolt
15 Timing indicator
16 Lockwasher spring
17 Lockwasher spring
18 Bolt
19 Lockwasher spring
20 Bolt
21 Bolt
22 Left hand front cover gasket
23 Right hand front cover gasket
24 Water pump dowel
25 Water pump dowel
26 Crankcase oil seal
27 Washer
28 Bolt
29 Clamp spacer
30 Tube clamp
31 Tube clamp
32 Hose clamp
33 Oil cooler hose clamp
34 Lock spring washer
35 Bolt
36 Oil pan gasket
37 Drain plug
38 Drain plug washer
39 Oil pan assembly
40 Chain oil jet
41 Crankcase baffle plate
42 Crankcase net
43 Relief valve
44 Rear engine plate
45 Oil level gauge
46 Oil level gauge guide
47 Oil pressure switch
48 Drain plug
49 Bearing oil seal
50 Crankcase oil seal
51 Taper plug
52 Welch plug
53 Timing chain cover dowel
54 Block to transmission case dowel
55 Block dowel
56 Block dowel
57 Dowel
58 Main bearing bolt
59 Cylinder block assembly

Automatic only