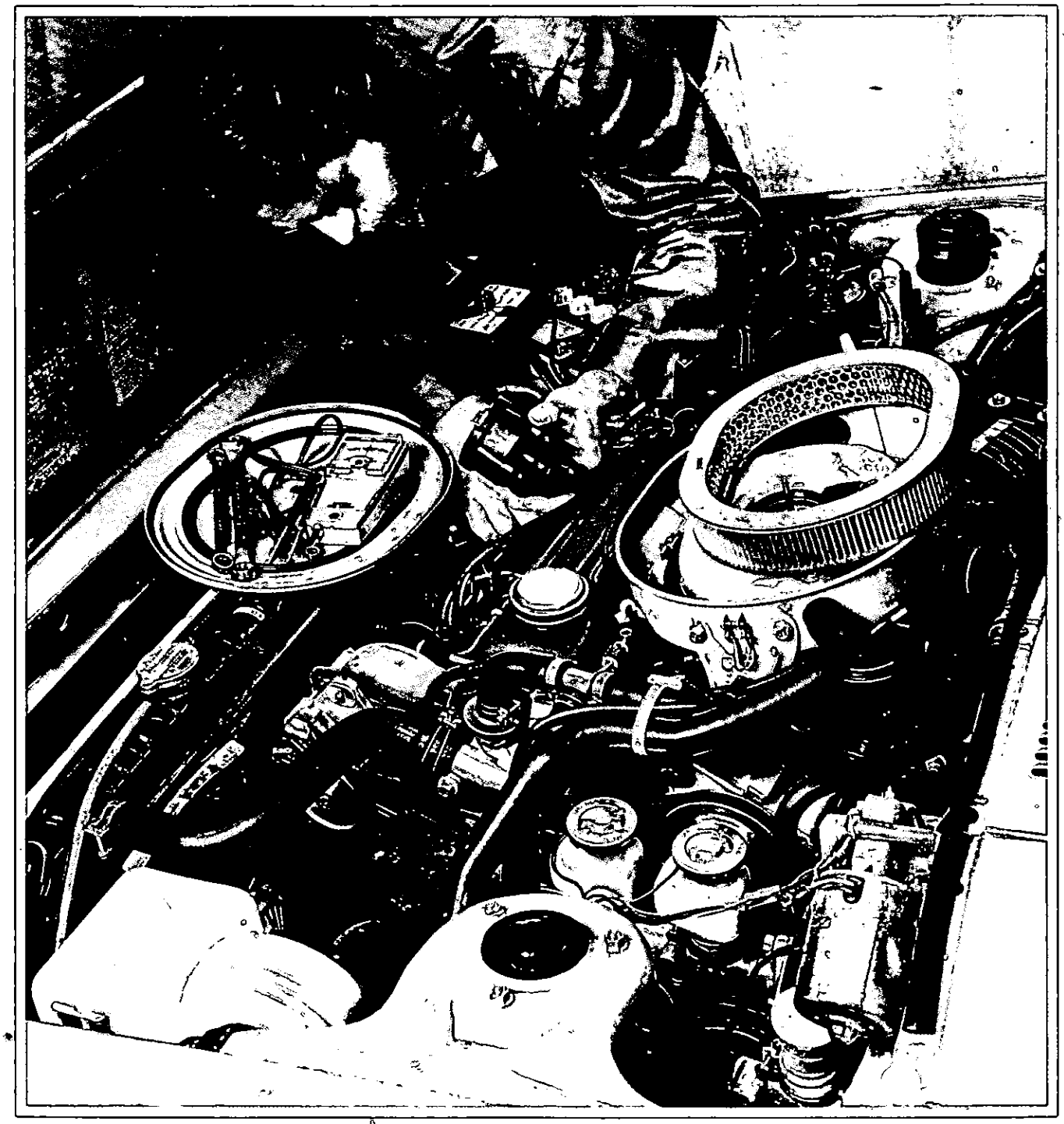
PETERSEN'S

In Canada $5.95 $4.95

0255050
PN 5050

# DATSUN

# TUNE-UP & REPAIR



# DATSUN
# TUNE-UP & REPAIR

# INTRODUCTION

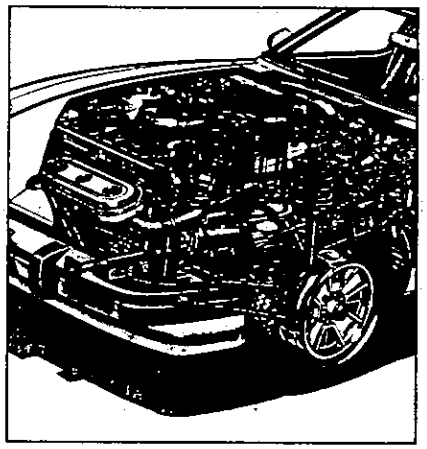
So the good folks at Datsun say they are driven? Well, the fine cars they produce are driven, too, driven long and hard by happy buyers who delight in the gas-saving attributes of these imported Japanese models. The trouble is, cars that are driven need regular seeing-to, not just under-hood where a regular tune-up is suggested at intervals specified in the owner's manual, but in the brake department, transmission area, and so forth. And that's why, if you are a proud Datsun owner, you need this book. It's the perfect bridge between the too-cursory owner's handbook and the overly deep factory shop manual.

Hopefully, then, this book will encourage you to get out and get under and save a few yen by doing some of the easier chores and little fix-its yourself rather than relying on an expensive professional mechanic.

No, we're not trying to take work away from the pros at the corner garage or at an authorized Datsun dealership. They have all the work they can handle in doing the bigger and more complicated repair jobs that are generally beyond the means of the driveway tinkerer. What we're trying to do is encourage you to handle smaller jobs your Datsun may need from time to time but which you just might overlook or put off doing, if it means tying your car up at a service agency for any length of time. The professional mechanic would probably just as soon have you change your own spark plugs, drain and replace your own oil and do the myriad other simple chores that need seeing-to on occasion, to keep him free for more specialized assignments.

So it's in this spirit that we have gathered together some of the easier chores that you as a Datsun owner are likely to face, and turned them into photographic how-to's that reveal the individual steps as the job progresses. This book should become as much a part of your tool kit as your screwdrivers and wrenches. In the interests of keeping your Datsun up on all fours and running to the best of your ability, let's see if we can help convince you to become "driven" yourself.

**SPENCE MURRAY**




**COVER:** Richard Cox may hold the title of senior editor for Petersen's **Motorcyclist** magazine, but it's not beneath him to try his hand at tuning a 1979 Datsun 310 since the job is so easy. Cover coordination by Eric Rickman. Photography by Pat Brollier of PPC Photographic. Cover design by Dick Fischer.

**SPECIALTY PUBLICATIONS DIVISION**

**Erwin M. Rosen**/Executive Editor
**Spencer Murray**/Senior Editor
**Al Hall**/Editor
**Dick Fischer**/Art Director
**Chriss Ohliger Jay**/Managing Editor
**Jim Norris**/Managing Editor
**Jay Storer**/Feature Editor
**Eric Rickman**/Photo Editor
**George Fukuda**/Assistant Art Director
**Angie Ullrich**/Editorial Assistant

**DATSUN TUNE-UP AND REPAIR MANUAL**

Edited by Spence Murray and the technical editors of Specialty Publications Division. 

**Library of Congress Catalog Card No. 79-64834**

**ISBN 0-8227-5050-3**

**PETERSEN PUBLISHING COMPANY**

**R.E. Petersen**/Chairman of the Board
**F.R. Walngrow**/President
**Robert E. Brown**/Sr. Vice President
**Dick Day**/Sr. Vice President
**Jim P. Walsh**/Sr. Vice President, National Advertising Director
**Robert MacLeod**/V.P., Publisher
**Thomas J. Slatos**/V.P., Group Publisher
**Philip E. Trimbach**/V.P. Finance
**William Porter**/V.P., Circulation Director
**James J. Krenek**/V.P. Manufacturing
**Jack Thompson**/Assistant Director, Circulation
**Nigel P. Heaton**/Director, Circulation Administration & Systems
**Louis Abbott**/Director, Production
**Don McGlathery**/Director, Research
**Al Isaacs**/Director, Graphics
**Bob D'Olivo**/Director, Photography
**Carol Johnson**/Director, Advertising Administration
**Maria Cox**/Director, Data Processing

# CONTENTS

# WHAT'S A TUNE-UP?

FOLLOW THESE PROCEDURES TO ENJOY MAXIMUM ECONOMY AND PERFORMANCE

The continuing energy crisis keeps driving home two very important facts to many drivers: Gasoline is not likely to become any more plentiful in the immediate future, and the cost of each gallon will gradually climb higher. One good reason for owning a Datsun is its reputation for economical driving. But to keep its engine running at peak performance and squeeze every possible mile from each gallon of gas, you must keep it properly tuned.

Datsun engines are designed to emit as few pollutants as possible into the air, making them as clean as possible, but they still have an emissions control system. This emissions system cannot do its job unless the engine is correctly tuned, and you can't tune the engine correctly if you don't know what the system is, where its components are located and how they operate. To solve this problem for new owners, a later chapter in this book deals with the evolving emissions system used on Datsun engines.

For now, let's take a look at exactly what a tune-up consists of. If you follow the procedure set forth on the next few pages, the end result will be good engine performance—and that will make the engine last longer, while giving you the good gas mileage for which Datsuns are well known. And if you take a hard look at your personal driving habits and change the bad ones, it's quite possible that your car will perform even better than you may have expected.

While most Datsun dealers service your car according to a factory schedule based on mileage, we prefer to follow a basic tune-up procedure, regardless of mileage. This includes a number of items that we feel should be checked every time the engine is tuned, although they may not be included in the factory maintenance schedule for every mileage check. An ounce of prevention is worth a pound of cure, and our procedure provides that ounce!

## TUNE-UP STEPS

**1.** Start the car's engine, shift the transmission into Neutral or Park and set the hand brake. Let the engine idle long enough to reach normal operating temperature; then raise the hood. Listen for any unusual sounding noises, such as a ping, knock or miss, etc. Now accelerate the engine slowly until it reaches about 2500 rpm. Listen for any differences in the sound as the rpm increase. Continue listening as you let the rpm drop back to idle. If you've taken fairly decent care of your Datsun, you're not likely to hear anything out of the ordinary—and that's what you want.

**2.** At this point, it's time to apply a good tune-up solvent to the carburetor. This is probably the most important part of the tune-up, other than timing the ignition correctly. The solvent should remove any light deposits in the carburetor and loosen up any carbon in the cylinders, so that it'll blow out through the exhaust when you drive the car. To apply the solvent, pull off the air cleaner, and with your hand on the throttle linkage accelerate the engine to about 1500 rpm. Begin pouring solvent into the carburetor throat, using your thumb over the spout to control the rate of delivery. The engine will start to slow down, just as if it were gagging (it is), so open the throttle as much as is necessary to keep it going. Continue pouring solvent and opening the throttle until it's about half-open—you're now controlling the engine speed with the solvent. When the can is just about empty, remove your thumb from the spout and pour in the remainder. This will kill the engine, so turn off the ignition and replace the air cleaner. Let the engine sit for about an hour to give the solvent an opportunity to loosen up any carbon in the chambers.

Once the engine has had a chance to do its job, start it up and let it run until it reaches normal operating temperature again. Now take the car out on the highway, and accelerate at wide-open throttle for about 4-5 seconds at a time. Since you can run wide-open throttle at any speed, the speed at which you perform this exercise is not relevant, as long as you remain within the legal speed limit. The important thing is to keep blowing the engine out with those wide-open throttle bursts until it doesn't miss any longer and no smoke or clinkers are coming out through the tailpipe.

This procedure won't ruin your engine, but it may play havoc with your spark plugs. And that's exactly why we recommend this as one of the initial steps in putting your engine in top running condition—there's little point in replacing or cleaning the plugs before doing this. If you have a weak exhaust system, you may well end up with a hole in the muffler from a misfire, which will allow gas to accumulate in the muffler and then explode. Once you've finished with the blowing-out process, don't be surprised if you've dropped a cylinder; it's a normal occurrence. This is usually caused by splash-fouling of the plugs. In fact, it's possible that the plugs may be so badly splash-fouled that even a sand-blaster won't clean them up satisfactorily, and you'll have to replace them with new ones.

**3.** While the engine cools down to a point where you can work on or around it without burning yourself, test the battery for a full charge. Check the battery hold-down and tray; then inspect your battery cables and their connections. If the terminals show any signs of corrosion, remove the cable clamps from the posts and scrape or wire-brush the lead until it's bright metal again. Don't assume that all is well under those plastic protectors over the terminal clamps—if your model Datsun has them—corrosion can build up with them as much as it can without them. Once the post and clamp are both clean, use clear grease or petroleum jelly on both, before and after you put them back together. If you want to be fancy about it, you'll find numerous sprays on the market that are designed to prevent corrosion. While these all work, none is as inexpensive as a dab of plain old grease.

While you're at it, it's a good idea to clean the battery top. When dust and dirt mix with the acid on the top of any auto battery, they create an electrical path, and the battery begins to self-discharge. Use a solution of baking soda and water to get rid of the

acid accumulation; then rinse with clear water. You'll find complete instructions on proper battery care in a later chapter.

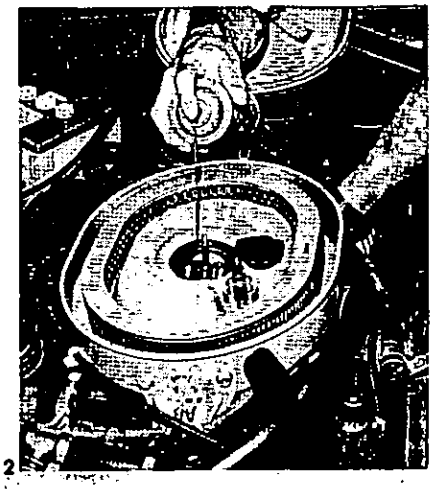
4. When you've finished with the battery, the engine will still be warm, and this is a good time to pull the spark plugs and take a compression check of each cylinder to find out just what condition your engine is actually in. (This test may tell you something you really don't want to know: If the compression is down, you have problems—cylinder leakage due to worn rings, defective valves or a leaking head gasket. If this turns out to be the case, you're in for much more than a basic tune-up.)

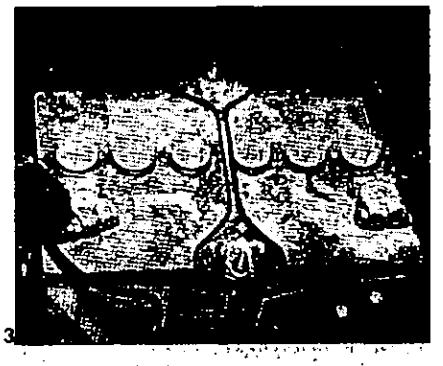
Start by cleaning the area around the spark plugs before you remove them; this prevents any dirt from getting into the cylinders while you're working with open access to the inside of the engine. A stiff-bristled brush will work well on most Datsuns, since the plugs are usually in a near-horizontal position in most of the engines. Remove a plug, and screw your compression gauge adapter into the plug hole. Crank the engine for at least four compression strokes, recording the highest gauge reading obtained. Do this for each cylinder and check your findings against the tune-up specifications to see whether or not the compression readings are acceptable. If compression is down on one or more cylinders, you may want to perform a cylinder leakage test to find out how great the leakage is and where it's taking place.

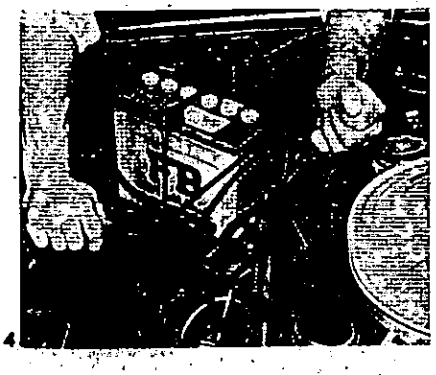
5. Once you've completed the compression test, check the condition of the spark plugs. You can do this simply by noting their color and the deposits found on the electrode end; use a plug comparison chart if you're really not too familiar with how a spark plug should look. Check the plug insulation for cracks, and compare the plug gap against the factory specifications.

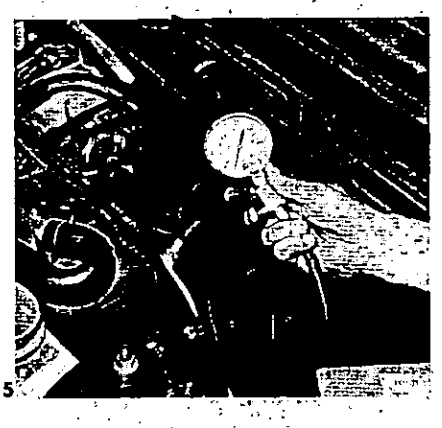
If the plugs appear to be good, they can often be reused after being cleaned in a sandblasting unit found in many garages. You can probably talk your way into getting it done for nothing more than a "thank you." Despite what you may have heard or read about other plug-cleaning methods, believe us when we tell you that there is no other method that can do the job

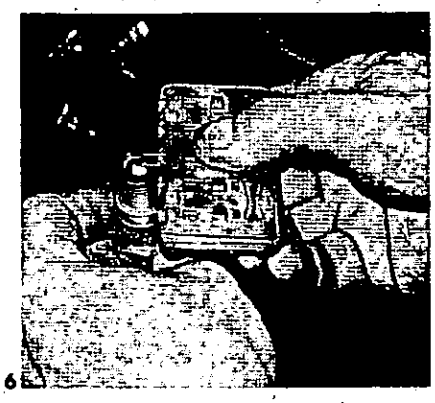

1

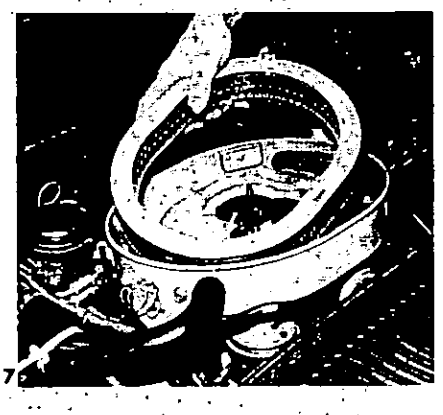

2


3


4


5


6


7


8

***1. Timing the engine is the final step in any tune-up. If you've done your job correctly, the end result will be good engine performance.***

***2. Tune-up solvents are also available in spray form. Hold the throttle open to prevent the engine from "gagging" as you spray the solvent down the carburetor throat.***

***3. Battery care is very important to prevent starting and charging problems. Once corrosion gets this kind of foothold, it's an uphill battle to save the terminal clamps and battery hold-down.***

***4. Pull the plugs every 5000 miles for a look. They can tell you various things about your engine's health.***

***5. Take a compression check whenever you pull the plugs. A simple vacuum gauge is probably the most valuable diagnostic tool you can use.***

***6. Never take the spark plug gap for granted, even on new plugs—check the gap to be sure before installation.***

***7. Remove the air cleaner filter for cleaning every 5000 miles. Tap the side of the element and you'll be surprised at how much dust and dirt will fall out.***

***8. Clean the air cleaner body before replacing the filter.***

properly. Those $5.95 plug cleaning machines sold in drug and department stores just won't do the job properly.

After cleaning the plugs, file the center electrode flat and sharp before resetting the gap, and your cleaned plugs should work just as well as new ones. But a word of caution—you can't run the same plugs for the life of the engine. If they have 12,000-15,000 miles or more on them, you might as well throw them away and install a new set, as the chances are pretty good that one or more will fail on the road before too much longer. Be sure to use the plugs specified by Datsun, or at least use equivalent plugs from a different manufacturer. Plug manufacturers publish equivalence tables to help in determining exactly what you need. And don't buy those remanufactured plugs with off-brand names; stick with plugs from such reputable companies as Champion, AC, NGK or Nippondenso; you'll be better off.

When installing a new set of plugs, make sure that they're of the same heat range (regardless of manufacturer) as the ones you removed, unless your inspection of the old plugs indicates that you should try a different heat range. In most cases, the specified plug will perform satisfactorily, although Datsun does recommend a different heat range for continuous low-speed driving or driving in consistently cold weather. Almost all plug manufacturers pregap their plugs these days, but that shouldn't stop you from double-checking the gap; we've found that enough of them deviate from the required setting to make the check worthwhile.

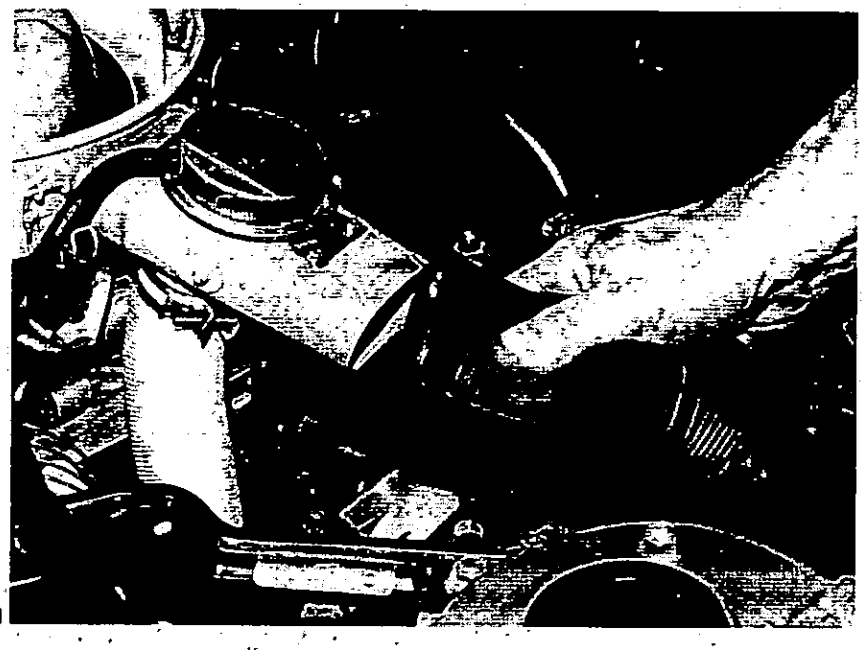
Install your new plugs, tightening them to the recommended torque. If you don't have a torque wrench, tighten them snugly and *stop*. Over-tightening the plugs is a common tendency on the part of many owners (they don't want them to fall out), but it will make their removal quite difficult during your next tune-up. Replace the wire connectors carefully to prevent damage to the resistance core inside, but make certain that they are completely seated on the plug, or you'll have problems.

**6.** Now it's time to work on the air cleaner. Remove the cover and lift out the filter element. These paper elements catch the dust and dirt in the air and prevent it from passing into the carburetor and engine where it causes problems. Because of the nature of the air pickup design used with Datsun cars, you'll find a good deal of dust and dirt trapped in the filter. The first two or three times you service the filter after installing a new one, you can adequately clean it by tapping the metal edge gently against a solid surface, and you'll probably be greatly surprised by the amount of material the filter has accumulated. But don't expect the filter to last forever, regardless of how clean it appears to be. Replace it at the factory-specified intervals for safety.

When reinstalling the filter element, make certain that it forms a tight seal against the can and lid of the air cleaner, because the element won't be of much help if the air can go around it. You'll find a rubber gasket used between the carburetor and air cleaner. This assures an airtight fit when the cleaner is installed. In some cases, the gasket may remain on the carburetor when the air cleaner is removed; in other cases, it may stick to the underside of the cleaner unit. Either way, make sure that a gasket is there when you're ready to replace the air cleaner.

Before replacing the filter, be sure to wipe the inside of the air cleaner with a cloth dampened in solvent to remove any remaining dust or dirt. Inspect the operation of the vacuum diaphragm control on the air cleaner snorkel, and check the air intake tube for leaks or cracks. If you find any, it's a good idea to replace the tube with a new one. Homemade repairs with tape are seldom satisfactory for more than a few days, because the heat in the engine compartment will cause the tape's adhesive to dry out.

**7.** While we're dealing with the air cleaner, it's a good time to check the condensation chamber. This little plastic cup is connected to the cylinder head cover breather chamber by a hose and serves a purpose similar to the PCV valve found on domestic cars. Remove the chamber and hoses from the air cleaner, and clean any sludge



1

2

or varnish with solvent. Make sure that all hoses are in good shape before you replace the chamber; if they're not, install a length of new hose.

**8.** Now to work on the distributor. Remove the cap and check it carefully inside and out for hairline cracks as you wipe the inside of the cap and its contacts clean. Pull off the rotor and inspect it as well. Look for burned and pitted blade areas in addition to hairline cracks. Replacing the breaker points in a Datsun distributor is no problem at all; if you've ever done it on a domestic distributor, you'll recognize the necessary procedure. If you've never worked on a distributor before, you still won't have any problem, since we've provided a how-to sequence at another point in this book. Be sure you get all of the leads back in the right place, so they won't ground out.

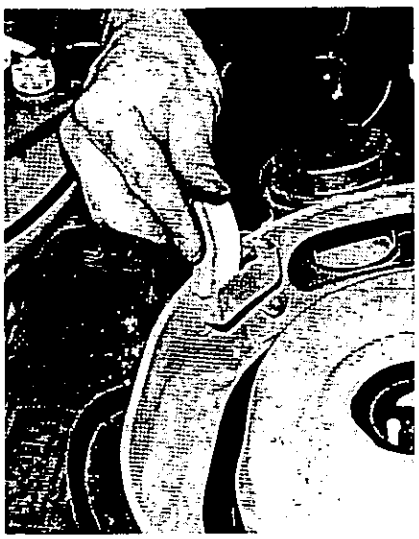
We don't believe in filing points. Those little files are great for working on the center electrode of a spark plug, but it's almost impossible to restore breaker points to like-new condition with them. If you're fascinated with point files, carry one in your toolbox—along with a new set of points—and never use it. You'll be ahead of the game in the long run.

**9.** Any time you change or regap the breaker points, engine timing must be reset. Connect a dwell-tach meter and timing light to the engine. Check the tune-up specifications for the correct timing setting. If you set the point gap by dwell, then the timing should be set after the dwell. Timing is set simply by loosening the hold-down bolt at the base of the distributor and rotating the entire distributor housing until the timing marks on the flywheel or driveplate align with the index mark on the crankcase under the flashes of the timing light.

**10.** Replace the fuel filter as specified. This is pretty much a routine job on most Datsuns, and filters are inexpensive. You'd be surprised at the number of problems that can develop as a result of a dirty fuel filter.

When replacing an oil filter, make sure that you use a filter with a built-in bypass system. It's best to buy replacement filters from your Datsun dealer, although other major filter manufacturers do offer them. Place a drain pan underneath the filter area and remove the old unit. Apply a light coat of engine oil to the rubber seal on the new filter, and install hand tight. Like spark plugs, an oil filter should not be overtightened, or removal will be very difficult the next time around.

**11.** To ensure proper emissions control operation, carburetor adjustment should be done only to specifications, since even a slight maladjustment will throw the emissions level off completely. When adjusting the idle speed and mixture, try to work within the range provided by the limiter caps. It should not be necessary to remove the limiter caps for such adjustments, unless the carburetor is in really bad shape. If this is the case, you should overhaul



3

***1. Remove and replace the zip tube carefully when you take the air cleaner off the carburetor. If you find any cracks or leaks in the tube, replace it with a new one.***

***2. Check the neoprene gasket that seals the air cleaner body against the carburetor. Replace if it is cracked or seems to be deteriorating.***

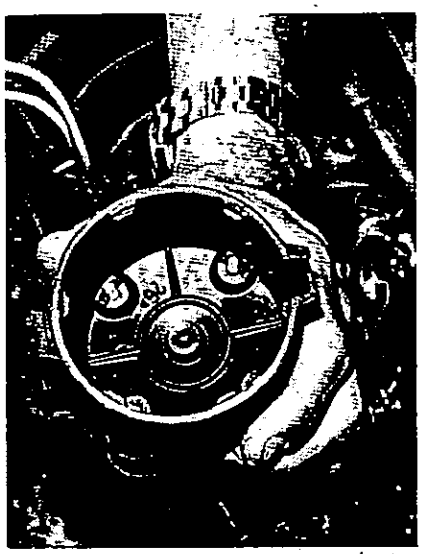
***3. There's a little filter inside the air cleaner body at the PCV valve connection. Clean or replace it if it is dirty; otherwise follow the mileage-interval instructions in your particular owner's manual.***

4

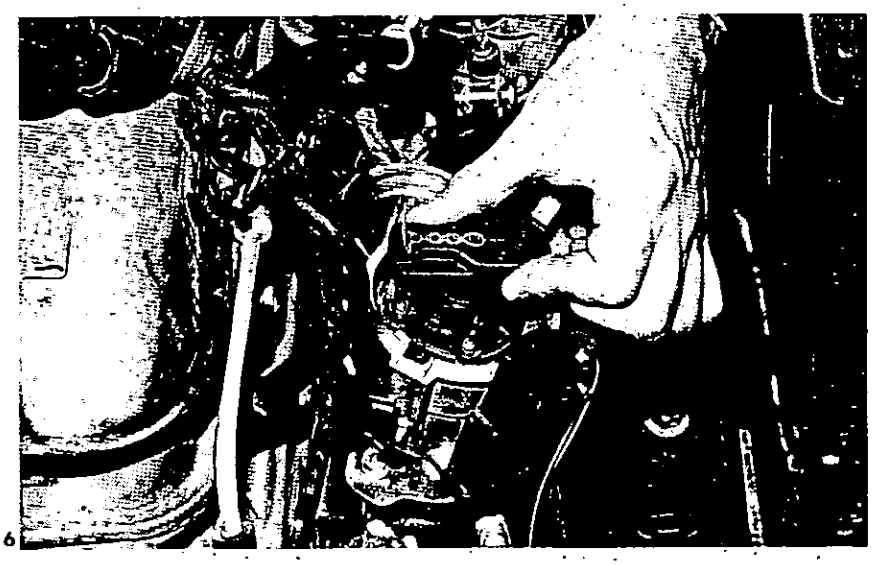
***4. On the new 310 models there are two brake fluid reservoirs, one for the front wheel braking system and one for the rear. They contain a sensor which signals a warning light on the dash when the fluid is low. Under the wiper motor in this view is a third fluid reservoir, for the hydraulic clutch. It doesn't have a sensor, so you should check it periodically.***

***5. As long as you're under the hood, pull the distributor cap. Make sure electrical contacts are clean and there are no signs of arcing.***

***6. Check the distributor rotor, too.***



5



6

the carburetor to restore it to proper running order rather than trying to make adjustments to compensate for the problem. Later on, we'll show you how to disassemble and rebuild the various Datsun carburetors.

**12.** Choke operation can't be checked on a hot engine, but you can move the choke butterfly with your finger to see if it will move freely or if it is sticking. Gum and varnish frequently collect around the choke shaft and cause it to bind. A little of that tune-up solvent you used at the beginning will free it up, if it is applied in the right place. You may have to take the butterfly off its shaft and do some filing or grinding to free it up. This problem is usually caused by a warped air horn on the carburetor.

**13.** As the emissions control system becomes more complicated, so does the pattern of vacuum lines and hoses that connect the components. You should pay particular attention to these lines and hoses—it's all too easy to pinch one when replacing an air cleaner. Look for damaged or deteriorated hoses and lines, and replace any that look suspicious. At the same time, look for loose bolts, cracked fan belts, corroded connections, chafed wires or other obvious problem spots. Taking care of such things now can save you headaches a few miles down the road.

**14.** Check the charging and starting systems with a fully charged battery. Hook up a voltmeter according to battery polarity, with one connection at the battery terminal of the coil and the other on a good engine ground. Disconnect the wire from the coil to the distributor; this will keep the engine from starting while you run a cranking voltage test. Crank the engine with the starter, and read the voltmeter; you should have at least 9 volts. Some authorities say that the minimum voltage should be 9.6 volts. If you get a borderline or obviously low reading, it means trouble ahead. Either the battery is weak, the starter is not putting out, there's a poor electrical connection somewhere, or the engine has abnormally high friction, as might be the case with a rebuilt or recently overhauled engine.

Some owners may feel that making a number of electrical tests is a waste of time unless you've been having electrical problems. However, testing the battery, charging and starting systems on a regular basis will help you predict trouble spots before they develop. A battery test will definitely pinpoint a failing battery before that frustrating morning when the car just won't start. Checking the charging system voltage setting and current output can give you a clue if something is weak. If the alternator doesn't produce its full rated output, then additional checks should be made instead of waiting until there's no charge at all.

Checking the starting system is the easiest test of all, since you can hear what's going on. If the cranking speed sounds fast, it's probably satisfactory; if it sounds sluggish and drawn out, you should check the battery output and then the starter's current draw.

Once you've finished this sequence of tests, take the car out for a road test. If you've done your job right, it should run better than it did before you started. But don't expect any miracles in terms of improvement—a tune-up is preventive maintenance, not a repair procedure. By tuning your engine, you are avoiding problems that can result in a breakdown on the road. If you've covered the areas outlined above, the engine should be operating at its peak, and emissions levels should remain within those specified by the manufacturer.

One area that you may want to get into a bit deeper is the carburetor. A carburetor should deliver many thou-