TECH TIPS

Here are the editors' choices for this month's **Tech Tips.** Each of these contributors will receive a copy of *Bosch Fuel Injection and Engine Management* compliments of **Robert Bentley, Publishers.**

We offer our congratulations and our thanks to each of you for taking the time from your busy schedules to drop us a card or a note. Keep up the good work.

SUBARU CHOKE PULL OFF REMEDY (PART ONE)

The Hitachi-two barrel carburetor used on many 1980 and later Subaru models has a non-replaceable choke pull off. If the choke pull off diaphragm fails, the whole carburetor choke chamber (carburetor top) must be purchased to replace the choke pull off. The approximate $200 cost of this part put me in an inventive frame of mind.

After removing the carburetor top, I carefully removed the defective choke pull off with an air grinder. Then I used an air grinder and a file to reshape the opening in the pull off bracket to accept a Borg Warner VC 317 replacement choke pull off (under $10.00). The new pull off fits snugly in the modified carburetor top bracket.

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SUBARU CHOKE PULL OFF REMEDY (PART TWO)

Here's a slightly different approach to the non-replaceable Subaru choke pull off problem. A Subaru factory update kit is available to correct fuel percolation problems on 1981 and 1982 models with Hitachi two-barrel carburetors. The kit includes an updated carburetor top with a vacuum controlled bowl vent. On 1983 and later Hitachi-equipped Subarus, the bowl vent modification was made at the factory.

The update kit has a list price below $30.00, and a brand new carburetor top and choke pull off are included in the bargain. Update kit part numbers are:
1981 "F1" Kit: 483 367 000
1982 "F2" Kit: 483 387 000

The same carburetor top is used in both kits. The main difference is in the additional attaching parts contained in each kit. Carburetor tops from these kits have also been successfully installed on later model Subaru Hitachi carburetors at a considerable savings to the customer.

Similar Hitachi carburetors, also with non-replaceable choke pull offs, are used on many Nissan models. With some modification, a Hitachi carburetor top designed for a Subaru can also be installed on a Nissan Hitachi carburetor to replace a defective choke pull off.

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MERCEDES-BENZ SWITCH-OVER VALVE

It has come to my attention that some Mercedes-Benz technicians are neglecting a vital step when servicing the engine overload protection system on 617.951/952 engines. These are 5-cylinder turbo diesel engines used between 1978 and 1985.

A switch-over valve, located in the line between the intake manifold and the diesel injection pump controls vacuum to an aneroid compensator on the injection pump. This compensator is a bellows-type control.

The aneroid compensator is used to control injection pump fuel delivery rates under load. The problem starts when the switch-over valve becomes plugged with carbon during normal service (sometimes as early as 30,000 miles). When the valve becomes plugged, the circuit signals an overload condition. This opens the aneroid bellows to atmosphere, resulting in reduced fuel delivery, and a noticeable power loss under load.

This condition has been mistakenly diagnosed as turbo failure. And even when the valve has been properly diagnosed as the cause of the power loss, failure to properly clean the circuit between the manifold and bellows has made switch-over valve replacement useless.

To properly correct this condition, proceed as follows:

- **Clean or replace the switch-over valve if it is found to be plugged.** (Some early valves could be disassembled for cleaning.)
- **Remove the pressure lines between the valve and the intake, and also between the valve and the aneroid bellows.** Make sure the lines are clean and free of carbon. Sometimes solvent alone will flush them clean. Others will be so stubbornly plugged, that a stiff piece of mechanics wire will be needed to break stubborn deposits loose.
- **Don't forget to inspect and clean the banjo bolt fittings too, as they can also become plugged.** The manifold bolt is usually plugged shut, but can easily be cleaned with a drill bit and a hand vise.
- **Although there are few problems with them, be sure to check the pressure switch and the aneroid compensator to make sure they're working properly.**

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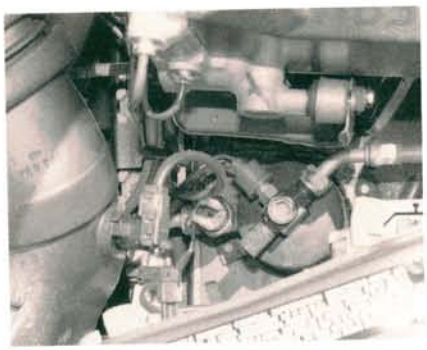
GREY MARKET MERCEDES AIR CONDITIONING FAN



This tip has to do with differences in the air conditioning cooling fan wiring between European and U.S. spec Mercedes-Benz 190 series cars. The U.S. version of the 190 Mercedes-Benz has a resistor that provides a low speed, and a separate high speed for the auxiliary cooling fan. But you'll occasionally run across a 190 2.3 liter model that has no resistor (bolted next to the receiver drier behind the left front headlight on U.S. spec cars). If you also notice that the 190 you're working on doesn't have all the relays you're used to seeing, chances are this is a Euro-model or "grey-market" car. Most of the cars in question will fall between late 1984 and early 1987 model years.

The auxiliary fan circuit on these models is wired differently on European spec cars than it is on U.S. spec cars. On Euro-cars, the high pressure switch in the receiver drier controls both the coolant fan clutch and the auxiliary cooling fan. (There is also a 100 degree C coolant switch in the cluster of

switches behind the thermostat housing on the head that controls engine cooling with the A/C off, but we'll ignore this one, as it's bypassed in the "A/C On Mode" anyhow.)

The green high pressure switch on the drier closes when the high side pressures reach about 20 bar (300 PSI). This turns on the auxiliary cooling fan and the cooling fan clutch. When high side pressures drop to about 15 bar (220 PSI), the switch opens, turning off the fans. In addition to the resistor and high pressure switch, the circuit is also controlled by fuse #3 and a double 15 amp relay (P/N 001 542 5319) located in the main fuse/relay box.

Depending on the outside temperature and the way the car is driven, the poor high pressure switch can work itself to death, since its whole life is a fast on/off cycle. This is especially noticeable when the car is driven in stop-and-go traffic, since there is no air forced under the hood as there would be if the car were traveling at road speed.

Under these circumstances, the switch gets hyperactive, with high and low pressures taking a roller coaster ride as a result. Finally, the green, high pressure switch will fail from overwork. It may stick open. Or it may choose an annoying 10 to 15 second off time, followed by a 5 to 10 second on time at about 230 to 240 PSI. The switch doesn't know if it's coming or going at this point, and its hyperactive behavior causes the same erratic behavior at the coolant fans.

The best way to solve all this is to add the resistor and relay used on the U. S. spec cars. That way the condenser receives a constant low speed fan push with the air conditioner on. This eliminates the problems caused by the wiring of the Euro-spec car.

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DYNAMIC OIL PRESSURE FOLLOW-UP

Here's a follow up on the VW Dynamic oil pressure system. Recently, we've seen a number of cars that acted up on an intermittent basis. Some time consuming diagnosis finally led us to a hairline crack in the printed circuit board behind the speedometer. We have now replaced a number of these boards, all of which were cracked in the same place.

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