



Trans Mission



Each time you repair an automatic transmission, it's no exaggeration to say that you are embarking on a potentially perilous mission. If you begin without proper preparation, act carelessly, or devote less than your full attention to the job, disaster and disappointment are ready to spring into action. Each carries a license to kill your profits.

We'll assume that you're a seasoned operative when it comes to internal transmission repairs. You know your way around a planetary set and you're pretty handy with a valve body too. You can even adjust a brake band in poor lighting if the situation demands it.

Telling an experienced transmission agent how to overhaul a transmission would be like telling James

Bond how to clean his Walther PPK. So we'll concentrate on several small but equally important steps that should come either before the transmission is removed for an overhaul, or after it's been reinstalled.

Some of our tips may seem simple to you. Perhaps you've been entrusting transmission removals and installations to a less experienced apprentice agent while you concentrate on actual overhauls. But what happens when the freshly reinstalled transmission doesn't operate properly, even though you know that it was put together properly?

Remember, you've accepted this trans mission. Your economic survival depends on your ability to collect the necessary information, finish the mission, and bring home a profit. We'll be right behind you.

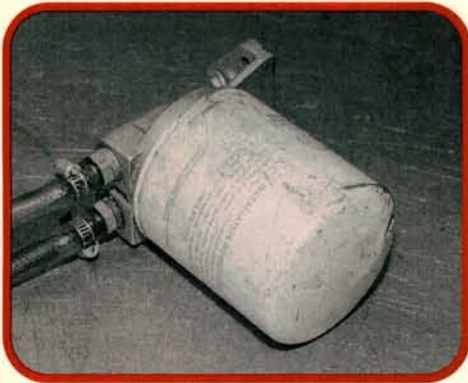
— By Karl Seyfert

**1**

A torque converter can collect a lot of debris after a major transmission meltdown, and no amount of soaking and flushing the converter will remove all of the dirt. Maybe the customer's budget can't handle a new converter, but who's going to pick up the tab when your rebuild goes south?

**2**

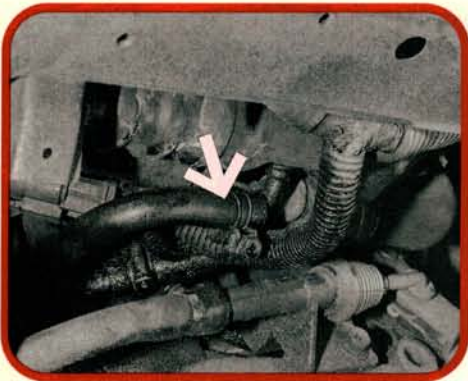
Some import transmission filters would make really nice screen doors. They do a great job of keeping large debris out of the transmission's inner workings, but often fall short when it comes to microscopic particles. Any dirt left from the last failure ends up here, eager to jam the valve body.

**3**

The transmission cooler is another hiding place for debris. Blowing out the cooler and lines doesn't mean you're safe. Installing this temporary auxiliary oil filter in the cooler lines catches any leftover debris during the rebuilt transmission's first several hours of operation.

**4**

An inline filter can be added to the transmission cooler line for an extra measure of protection, especially on transmissions with inaccessible main filters. Some of these filters also include a magnet to trap metallic particles. Don't count on these filters to catch leftover particles from a sloppy rebuild, however.

**5**

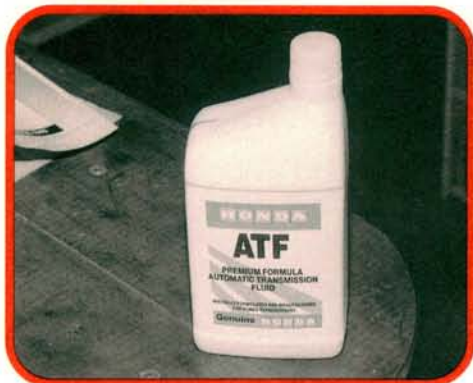
Check the condition of the transmission cooler lines from beginning to end. A line that has been accidentally damaged while wrestling the transmission out of the car will reduce the flow through the cooler, shorten the transmission's service life, and bring the customer back for an explanation.

**6**

Take a look at the radiator air inlet on an average car. Pretty small, right? And yet, I've seen everything from spare tires to motorcycles mounted directly in front of the grill opening on dozens of cars. Even something as small as fog lights can affect the trans cooler efficiency on this Miata.

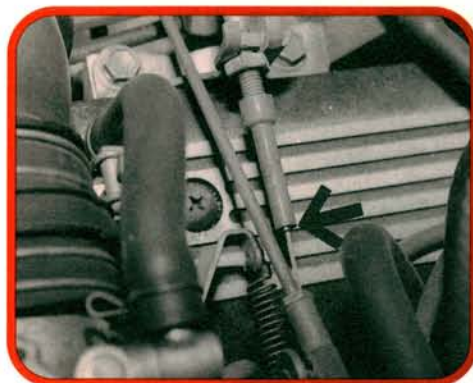


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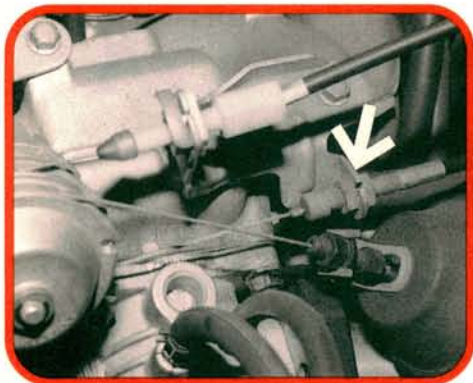
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The shift quality of some import transmissions (especially Hondas) can be affected by the ATF that is used. Different brands have different coefficients of friction, even though they're all labeled Dexron II. You may have to use OE fluid to soften a hard shifting Honda transmission.



8

If the transmission still has a throttle cable, follow the factory adjustment procedures. An adjustment as small as a half turn can make a big difference in shift timing and feel. Throttle cables are becoming increasingly rare as more transmissions switch to all electronic operation.



9

On Volvo 240 automatics, movement of the throttle linkage can bend the transmission throttle cable mounting bracket out of shape over time. This affects the throttle cable adjustment and will cause high, hard shifts. Straighten the mounting bracket, then readjust the throttle cable.



10

It may take a test ride with a transmission pressure gauge to tailor the throttle cable adjustment to an individual car. Move the cable adjustment slightly, then retest. This Fluke pressure/vacuum adapter allows us to accurately test transmission pressures with a DVOM while we're driving the car.



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A worn or misadjusted manual shift linkage can also affect transmission operation. Make sure the transmission's manual valve is completely engaging the gear you have selected at the shifter. Partial manual valve engagement will prevent the proper fluid pressure from reaching the rest of the valve body.



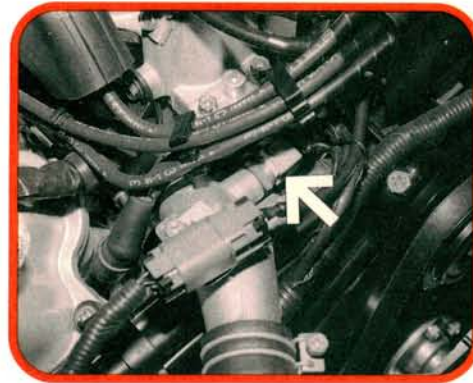
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Don't underestimate the effect that engine performance can have on transmission operation. If the engine runs so badly that you have to keep the accelerator pedal to the floor most of the time, late and hard shifts may be the result. Low engine vacuum will also affect transmissions with vacuum modulators.



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Engine performance can also affect torque converter clutch operation. If the converter clutch engages and disengages at higher speeds, it may be because the engine is running too poorly to maintain a constant speed. Engine misses at higher speeds may also be misdiagnosed as converter clutch chatter.



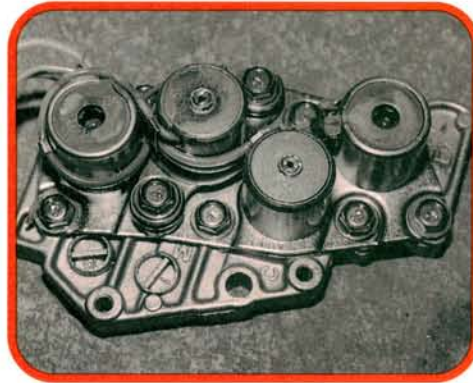
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Failed input sensors may affect electronic transmission operation. This Nissan transmission had no overdrive because the engine temperature sensor had failed. The transmission control unit normally uses the sensor input to prevent overdrive operation until the engine has reached operating temperature.



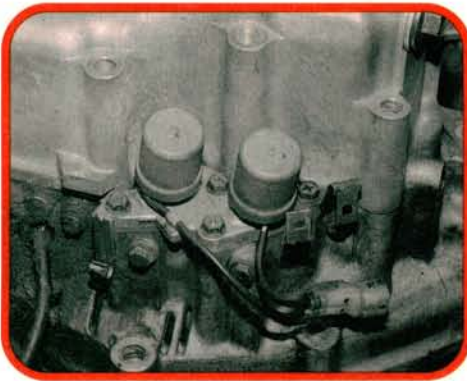
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The Throttle Position Sensor is the primary engine load input on most electronically controlled transmissions. Transmission operation will be affected if the sensor is damaged, misadjusted, or if there's an open or short in the sensor wiring. A damaged TPS caused erratic shifts on this Nissan.



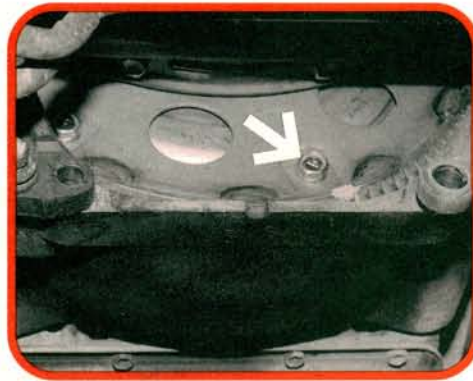
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The magnets used inside electronic shift control solenoids will attract any ferrous metal that's floating around inside the transmission. Thoroughly clean or replace these solenoids during a rebuild. If the transmission requires complete disassembly to reach the solenoids, replacement may be the better choice.



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The shift solenoids are mounted on the outside of this Honda transaxle, making them a bit more accessible. You won't have to disassemble the transmission a second time if a solenoid sticks later. Test them with an external power supply during the rebuild and replace any solenoid that sticks.



18

To prevent accidental damage, pay attention to the proper location of all mounting hardware when the transmission is removed. On Toyota torque converters, using longer than normal flywheel-to-converter bolts can dimple the torque converter clutch friction surface, causing converter clutch chatter.



19

Transmission removal requires disassembling half of the car on some models. After the transmission has been reinstalled, make sure everything is properly realigned. Repositioning the transmission an inch or less can have a big effect on the manual shift linkage adjustment.



20

I've seen several transmissions die on the operating table because improper installation techniques were used. Was the transmission left hanging by one bolt while you went looking for a transmission jack? Was the torque converter forced back into the transmission after it slipped out of the pump?



21

It helps to know how the vehicle has been used. Finding out that the owner has been using his Tercel to pull a 30-foot Airstream may help you understand why the transmission failed. Also, time spent educating your customer on proper vehicle usage should extend the life span of your rebuild.