



Do You *Really* Need to Replace the Trans?

NOTE: This article applies to '99 3.2TLs, '97-99 3.0CLs, and '98-99 2.3CLs.

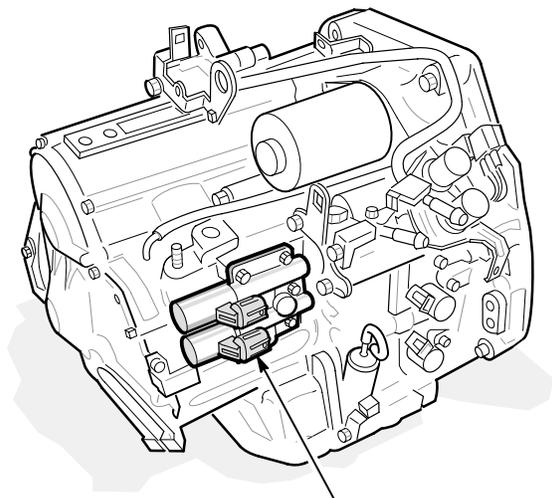
Before you replace the A/T for complaints of fast or early upshifts, or other complaints like shift harshness, delay, flaring, or slippage *without the MIL on*, do this to make sure replacement is needed:

1. Inspect the A/T clutch pressure control solenoid valve A/B assembly. Look for valve damage or leaks, and make sure the wires and connectors are OK.

Does the valve look OK?

YES – Go to step 2.

NO – Replace the valve, then go to step 2.



A/T CLUTCH PRESSURE CONTROL SOLENOID A/B ASSEMBLY

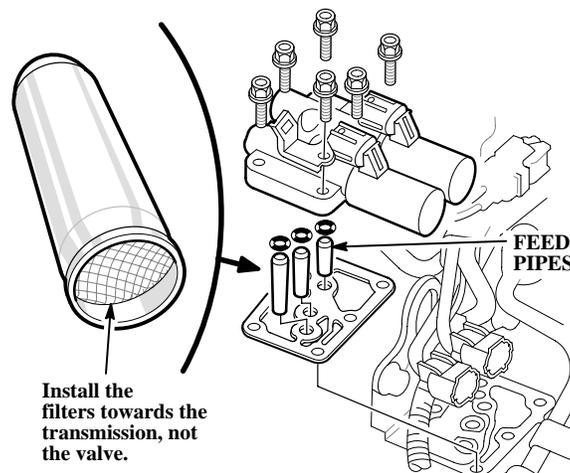
2. Hook up the PGM Tester, and check for DTCs. Look for A/T DTC P1738 (2nd clutch pressure switch) and P1739 (3rd clutch pressure switch). A problem with either switch will set a code, but won't cause the D4 indicator or the MIL to come on.

Are there any DTCs?

YES – Correct the causes of the DTC(s), then clear the code(s), and test-drive the car. If the shift problem is gone, return the car to the customer. If it's still there, go to step 3.

NO – Go to step 3.
3. Remove the clutch pressure control solenoid valve A/B assembly (see section 14 of the appropriate S/M).
4. Pull the valve's feed pipes out of their ports on the trans.

- On L4s, there are three same-length pipes, each with a filter inside.
- On V6s, note the length of each pipe, the port you removed it from, and the pipe without a filter. (The filters on early '97 3.0CLs are in the valve itself.)



5. Check the feed pipe filters for contamination.

Are any filters contaminated?

YES – Go to step 6.

NO – Go to step 7.
6. Drain the ATF through a paint strainer or a paper coffee filter.

Did you find metal particles in the strainer or filter?

YES – Replace the trans with a remanufactured unit. ■

NO – Go to step 7.
7. Make sure the feed pipe filters are clean, then reinstall each one on either end of the pipe you removed it from.
8. Reinstall the pipes, filter side toward the trans. V6 pipes are port-specific; L4 pipes are not.
9. Install a new or a known-good clutch pressure control solenoid valve A/B assembly.
10. Refill the trans with Genuine Honda ATF, and test-drive the car.

Does the trans shift normally?

YES – The harsh or delayed shift was caused by a faulty or contaminated valve. Return the car to the customer. ■

NO – Perform normal troubleshooting to find and repair the problem.



NO_x Know-How You Should Know Now

For many areas of the country, NO_x testing has (or will) become a major part of vehicle emissions testing. You can be sure that customers whose vehicles fail the test due to high NO_x levels will be returning to your shop with questions. So even if you don't have NO_x testing equipment, you should know what NO_x is, what causes it, and how to reduce it.

What Is NO_x?

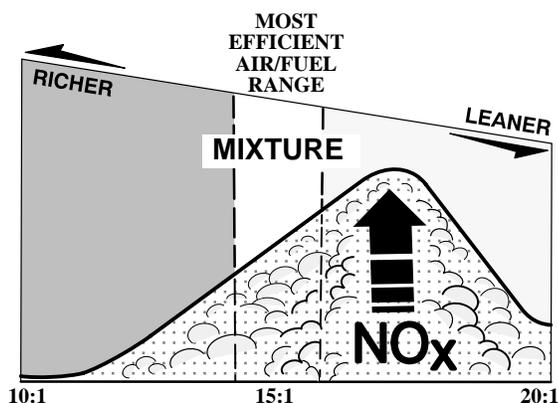
NO_x (oxides of nitrogen) is a product of nitrogen and oxygen combining at high, sustained temperatures (2,500°F or more) inside the engine's combustion chambers. NO_x becomes a problem when it mixes with hydrocarbons (unburned fuel vapor) in the lower atmosphere and forms that brown haze most of us are all too familiar with: smog.

What Causes NO_x

There are many factors involved in NO_x production. High, sustained combustion temperature is just one. Here are several others:

Engine ping: Plain and simple, if the engine detonates (pings), it's producing excessive NO_x. As a general rule, if you correct the detonation, you fix the NO_x problem.

Lean mixture: A lean mixture causes a higher than normal temperature in the intake air/fuel mixture, causing the preignition that produces high NO_x. Any condition that makes the engine run lean may increase NO_x.



NO_x levels are mostly affected by combustion temperature, but they also tend to vary with mixture levels.

Rich mixture: A richer than normal mixture won't increase NO_x, but the high CO (carbon monoxide) it creates will mask excessive NO_x. Before you check the NO_x reading, lower the CO level by correcting the mixture.

Over-advanced ignition timing: This is a cause of detonation, making it a related cause of excessive NO_x. Over-advanced timing creates an early build-up of combustion chamber pressure. The still increasing pressure causes a secondary flame front inside the chamber to collide with the flame front of normal combustion. The sound of this collision is the "ping."

Carbon deposits: If hot carbon deposits ignite the mixture before normal combustion begins, the resulting flame front collides with the flame front of normal combustion. The noise of this collision is preignition, and preignition causes excessive NO_x.

Low octane fuel: Low octane fuel is more likely to detonate than high octane fuel. If you use a fuel with a lower than recommended octane level, it can cause the preignition that produces NO_x.

Fuel Injectors: The altered spray patterns of dirty injectors can create hot spots in combustion chambers that increase NO_x. And a clogged injector causes more NO_x because its combustion chamber temperature rises. Clogged injectors also reduce the NO_x-lowering capability of the catalytic converter because they increase oxygen in the exhaust.

NO_x Control

A vehicle's emissions control system reduces NO_x two ways: during precombustion with EGR (exhaust gas recirculation), and during post combustion with the TWC (three-way catalytic converter). By injecting a small amount of exhaust gas into the intake stream, EGR lowers the temperature of combustion and reduces NO_x. The TWC then uses a reduction method to lower NO_x even more. (The TWC also lowers HC [hydrocarbons] and CO levels through oxidation.) When it leaves the tailpipe, most of the exhaust gas has been converted to water vapor and carbon dioxide. *On a healthy engine under load, the NO_x level out the tailpipe should be 200 to 600 PPM (parts per million).*

How to Reduce NO_x

To reduce NO_x on a vehicle that fails an emissions test, do these 10 steps, in order:

1. Check the timing, and make sure it's within specification.
2. Make sure the knock sensor and its circuit are working. A malfunctioning sensor can cause over-advanced timing.
3. Check the EGR system. Look for correct vacuum to the EGR valve and proper valve operation.
4. If needed, clear any clogged EGR passages.
5. Make sure the octane rating of the fuel being used is high enough for the engine.
6. Check the coolant level, and fill it if needed.
7. Check the cooling system (thermostat, cooling fan, fan clutch, etc.) for proper operation. If any of these parts aren't working, they'll cause excessive NO_x from an overheated engine or a high intake air temperature.
8. Check for dirty or clogged fuel injectors, and clean or replace them as needed.
9. Check the O₂ sensor reading(s) for an overly lean mixture, and correct the mixture if needed.
10. If the previous steps didn't reduce the NO_x level, use a decarbonizer to remove carbon buildup in the combustion chambers. Decarbonization is covered in S/B 93-006, *Cold Engine Knock*, filed under Engine.

Immobilizer Key Programming

When you're using the PGM Tester to program immobilizer keys, the error message "Immobi Failure" usually means you tried to program a non-immobilizer key. To avoid repeating the error message, start over, and make sure all the keys are immobilizer keys.

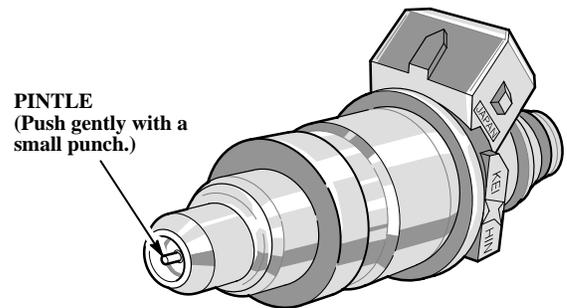


Check New Injectors Before Installation

NOTE: This subject was originally covered in the February '88 S/N.

Replacement fuel injectors come with rust inhibitor inside them. If injectors sit for a long time on the shelf, the rust inhibitor can cause them to "gum up" and stick.

So before you install *any* new injector, take a small, flat-tip punch and gently push down on the injector's pintle. Don't push too hard, or you'll damage the injector. As long as you can push the pintle, the injector will work fine when you install it.



Speedo Error Check

A complaint of "speedometer reads too fast" is rarely solved by replacing the speedo. The best thing you can do is verify speedo accuracy. Here's how:

- Make sure the tires are the correct size for the vehicle. And make sure they're properly inflated. Use the inflation pressure recommended in the owner's manual or on the doorjamb sticker. Don't use the maximum inflation shown on the tire's sidewall.
- Find a mile-marked stretch of highway where you can safely (and legally) maintain 60 mph.
- Use a stopwatch to measure the time it takes to go one mile at a steady 60 mph. (If the car has cruise control, set it to 60 to help you maintain a steady speed.)
- If it took 60 to 66 seconds to go 1 mile, the speedometer is within its 10 percent design tolerance.

Customers who suspect a fast speedometer may also be concerned that the odometer is logging more miles than the car actually travels. But let them know that odometers are extremely accurate, and there's no correlation between speedometer accuracy and the odometer reading.



1-2 Shift Complaint: '96-98 RL and T/L

NOTE: To complete the steps in this article, you'll need one or more of these publications:

- June '97 issue of S/N
- S/B 98-012, *Shift Shock, Judder, or Noise During 1st to 2nd Upshift* (filed under Transaxle)
- S/B 90-009, *Automatic Transmission In-Warranty Exchange Program* (filed under Transaxle)

On '96-98 3.5RLs and 3.2TLs, most customer complaints of poor 1-2 shift quality are caused by ATF contamination. This contamination is usually the result of

- solvent and water in the A/T cooler from improper flushing, or
- use of aftermarket A/T additives or non-Honda ATF, or
- leftover solvent from the remanufacturing process that mixes with the ATF.

Whenever you get a 1-2 shift complaint on one of these cars, follow the appropriate procedure below.

'96-98 3.2TLs

1. Check the A/T to see if it's an original or a remanufactured unit. Remanufactured units have a tag next to the serial number on the case.
 - If it's an original or a reman installed before 7/1/98, replace the trans (see S/B 90-009).
 - If it's a reman installed 7/1/98 or later, go to step 2.
2. Flush the A/T (see page 4 of the June '97 S/N).
3. Take the car on a 10-to-20-mile drive in city traffic, shifting frequently between 1st and 2nd gear. After the drive, the shift quality should be improved.

Did the shift quality improve?

YES – Return the car to the customer. Shift quality will continue to improve over the next 100 to 200 miles until it's back to normal.■

NO – Replace the A/T. When you order the replacement, tell the RPO (remanufactured parts operations) order desk person that “flushing didn't fix the 1-2 shift problem.” And be sure to fill out the core return form completely.

'96-98 3.5RLs

1. Check the A/T to see if it's an original or a remanufactured unit. Remanufactured units have a tag next to the serial number on the case.
 - If the A/T is original or if the reman tag number is PD5-A01RM, do the procedure in S/B 98-012.
 - If the reman tag number is PD5-A02RM, go to step 2.
2. Flush the A/T (see page 4 of the June '97 S/N).
3. Take the car on a 10-to-20-mile drive in city traffic, shifting frequently between 1st and 2nd gear. After the drive, the shift quality should be improved.

Did the shift quality improve?

YES – Return the car to the customer. Shift quality will continue to improve over the next 100 to 200 miles until it's back to normal.■

NO – Do the procedure in S/B 98-012.



Where to Direct Your DTC Calls

To get a quick response from Tech Line when you call with a DTC problem, first hook up the PGM Tester, check the DTCs, and record the freeze data. Then . . .

- If you retrieve trans-related DTCs (P0700, P0715, P0720, P0730, P0740, P0753, or P0758), press 2 (general) from the Tech Line phone menu.
- For any other DTCs, press 1 (engine performance) from the menu.

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