

Hondamatic

There's one thing to be said for studying the cars from Honda: It's never boring. There's always something different, something you won't see in cars from other manufacturers. So many other vehicle designs have taken on that cookie cutter, me-too look. Not Honda.

The unique design of the Hondamatic is no exception. Originally a two speed (HondaGlide?),

Hondamatics have evolved over the past 18 years into full blown four speeds with lock up converters. Most recently, they have become electronically controlled.

Easy there big fella, no electronics this time around. For now, we'll study the four speeds so commonly used not only in Accords and Preludes, but also in Legends and Integras.

Look for the following oddities as we highlight the Hondamatic:

- A servo-driven shift fork which moves a selector hub back and forth between 4th and reverse counter gears.
- A complicated maze of pipes and drillings which feed oil here and there to lubricate moving parts, and operate clutch packs.
- A set of machining tolerances so close that o-rings, not lip seals are used throughout.
- A stator-driven main pressure regulator which senses the torque converter's torque range to control main pressure.
- A transmission which uses needle bearings everywhere. No bushings or plastic shims to worry about.

Buy the Book

Many of the tips in our article aren't in the shop manual. And for those of you who avoid A/T internals as you would an IRS audit, the tips on torque converter seals, driveshaft seals, and cable adjustments may still come in handy.

Anybody who tackles one of these without being formally introduced to the shop manual is probably courting disaster. This article is no replacement for the repair manual.

Our thanks to John Wozniak of Freudenberg-NOK for his always pleasant assistance in the preparation of this article. In addition to writing specs for replacement parts for Hondas and other import transmissions, John stays in touch with the real world by helping out with the Freudenberg-NOK technical hotline.

—By Ralph Birnbaum

Quick Tips

• **Throttle Cable Adjustments**—One of the most overlooked, and certainly one of the most important things to check before disassembling a Hondamatic for shift quality problems, is the adjustment of the throttle cable.

There have been a number of techniques suggested for proper adjustment of the cable. We won't list them all. Instead, remember this. For the transmission to upshift properly; for the converter to lock up and release when it should; for part throttle and full throttle downshifts to occur on time; the throttle control lever should start to move just as soon as the throttle starts to open.

You can fine tune shift points by making the cable a tad tighter (up to 3 mm). This becomes a matter of tinkering and fine tuning to satisfy the particular preferences of the owner.

Before checking cable adjustment, warm the engine. Check to be sure the accelerator cable is adjusted properly (a tiny bit of cable free play at the throttle, and full throttle opening with the pedal mashed).

Have an assistant lightly press on the gas pedal—just enough to remove any free play in the cable between the accelerator pedal and the throttle. Then have him slowly depress the pedal. At this instant, check to see that the throttle lever on the transmission moves as soon as the throttle starts to open.

• **We'll mention sticking governors in the photo sequence.** This is a real problem, especially since the governor is buried deep inside the trans. Occasionally, a small piece of debris in a sticking governor can be dislodged by blowing several short blasts of compressed air into the governor test port. (Be sure you remove the dipstick to vent case pressure or you may blow some seals.)

Rather than give you general (and potentially misleading info) about replacement parts for governors, we suggest you check with your local Honda parts department for your application. There have

been a number of revisions, and some replacement parts won't interchange with earlier components.

• **Our article will also give you a brief description of the plumbing system in the Hondamatic.** Bent, improperly installed, or loose clutch feed pipes can result in internal fluid leaks and resulting shift flares. Always install the pipes in the end cover with new o-rings, and don't forget the snap ring retainers. Then check the tubes for a tight fit (less than 1 mm end play) after they're installed in the end cover.

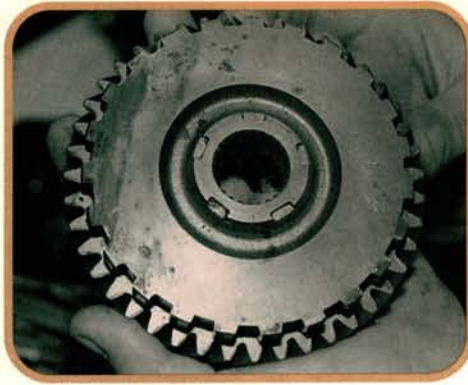
• **Speaking of the end cover, be careful as you install it.** This is not a rubber mallet installation. Align the cover carefully. Make sure the clutch feed tubes slide smoothly into the main and countershaft bores. Never force a binding cover into place without first finding the source of a potential misalignment. Some clutch feed pipe bushings in main and countershafts, and even some end covers, have been damaged with the muscle man approach.

• **When reassembling the valve body, make sure the shaft for the oil pump driven gear doesn't bind in the valve body as the top of the valve body is bolted down against the separator plate.** After assembling the valve body, grab the inside of the pump shaft with internal snap ring pliers and make sure it turns and slides freely.

• **Worn torque converter stator thrust washers in 1984 Preludes and Accords, and in some 1985 Accords caused a vibration while the vehicle was driven at speeds between 32 and 42 MPH in 4th gear.** An improved converter was made available to cure the problem. Check for vehicle applications and replacement torque converter part numbers at your Honda parts department.

• **Some 1984 and 1985 trannies wouldn't move in "D" when cold.** Selecting "R" or "2" was the only way to get them going. The problem? A slipping one way clutch between the countershaft low gear and the parking gear. Honda offered an improved part although they suggested replacement of all three parts. Discretion, discretion.

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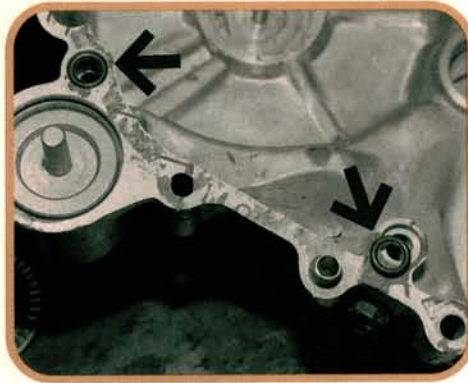
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The countershaft parking gear/ first gear combination hides beneath the end cover. The gears are joined by a one way clutch. After removing the assembly, hold it as shown. In this position, the top gear (parking gear) should rotate when turned counterclockwise, and it should lock when turned clockwise.



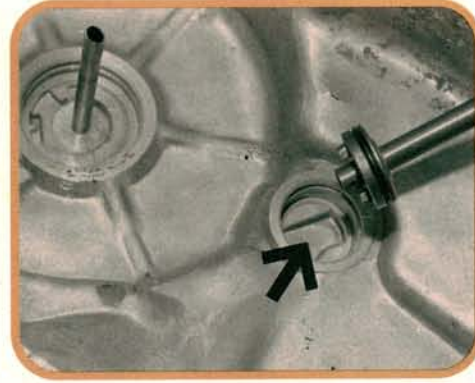
2

Let's look at internal oiling for a moment. Debris-filled trannys need close inspection. These oil pump gears ride in an aluminum cavity in the valve body. Check the areas shown by our arrows for galling, then check axial and thrust clearances with a feeler gauge as you would any other pump.



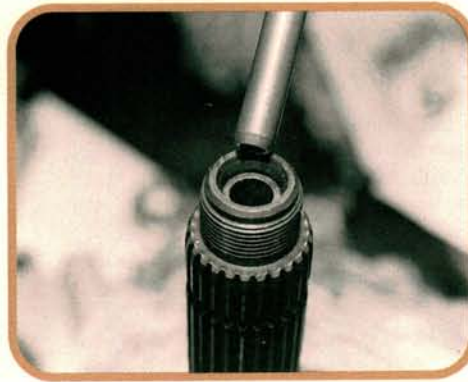
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Part of the oil from the pump passes through internal drillings in the case. These o-rings seal the drillings between the main case and end cover. Always replace them. The oil then makes a right turn in the end cover through two passages in the cover which will feed oil to the main and counter shafts.



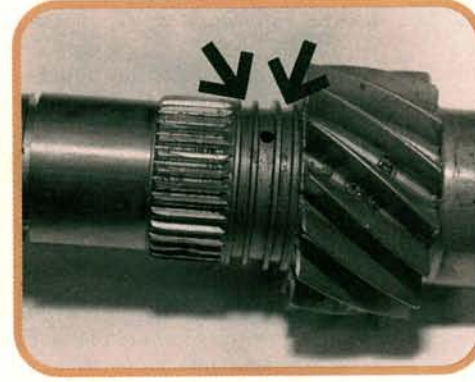
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Another right turn. From the passages in the end cover, oil enters these two tubes which slide into the hollow main and countershafts. This long tube oils the third gear clutch through the counter shaft. Each tube is sealed in the case with an o-ring and held to the case by a snap ring.



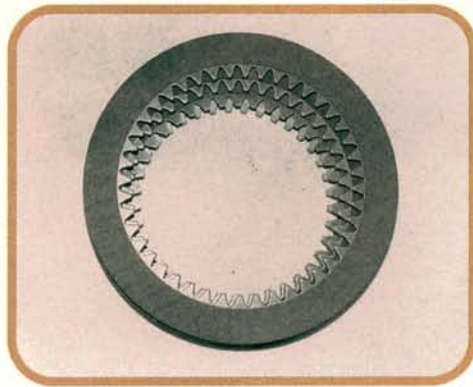
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Check for a close fit between the oiling tube and the bushing in the countershaft. We've already seen a number of places where hydraulic pressure can bleed off. Missing or weak o-rings, a forgotten snap ring holding the tube to the case, or a sloppy fit here all add up to a loss of pressure.



6

And it comes out here. There are two o-rings (identical in size) which fit into the grooves shown by our arrows. Oil to apply the clutches exits through the holes between the o-rings. As we've seen, the oil has to come a long way under pressure for the clutch to properly apply, or we get flared shifts.



7

Clutch friction linings come in three different diameters, depending on the application. Measuring lining outside diameters is a helpful way to identify transmission models. Check specs for your application. Only one size will be used for all clutch packs in any given transmission, however.



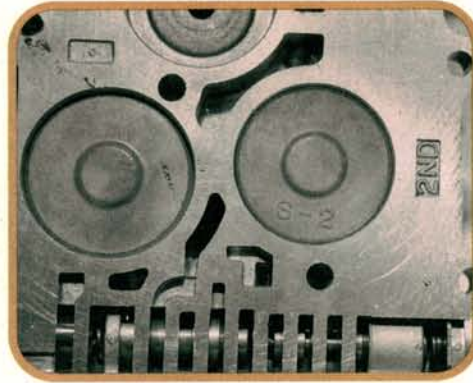
8

Note which way the domed face of this cushion washer faces at the base of the clutch pack. Not all face the same way. If someone else has worked on the tranny before you, it pays to double check the shop manual for correct installation. The manual contains side view illustrations showing up from down.



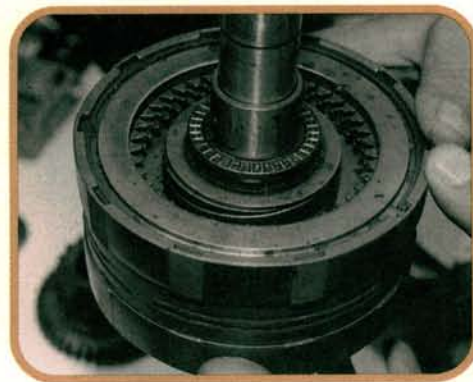
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There have been a number of reports of 2/4 drum failures. They can crack at several places, especially in the weaker areas near the groove for the clutch spring retainer snap ring. Another weak spot is the area near the oil inlet drillings. Replace any cracked drums.



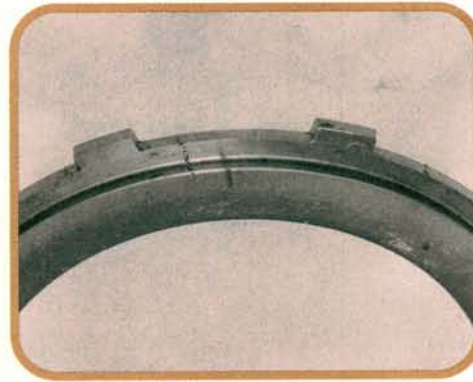
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This brings us to something we might call a "slide/bump" shift. It goes as follows: As the accumulator fills, some pressure still flows to the clutch pack to apply it. But improper fluids, or excess play in the clutch pack can cause the clutch to slip until the accumulator bottoms.



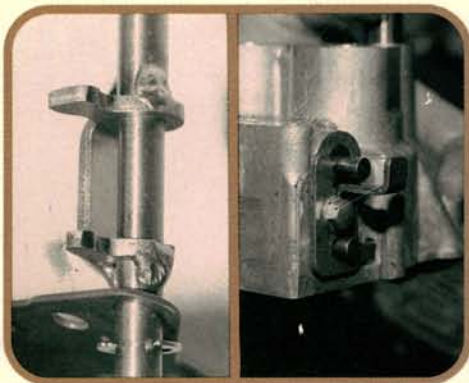
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With the accumulator fully compressed, the clutches apply completely—and suddenly, with a slight bump. There are several theories about the best fix, including the use of additives, but hotline information suggests that favoring the minimum spec for clutch pack clearance is the best long term cure.



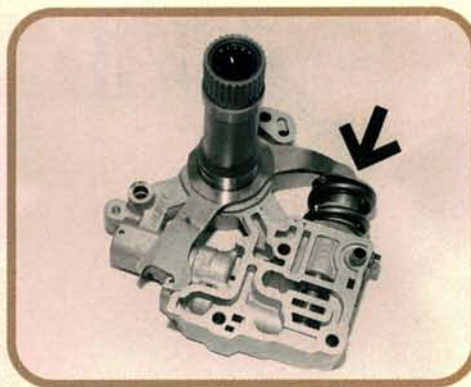
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Clutch pack clearance is adjusted as you would commonly adjust other clutch packs. Selective thickness end plates are used to set stack end play. As we said, favoring the minimum end play in the clutch stack helps improve shift quality, and reduces the chances of a "slide/bump" shift.



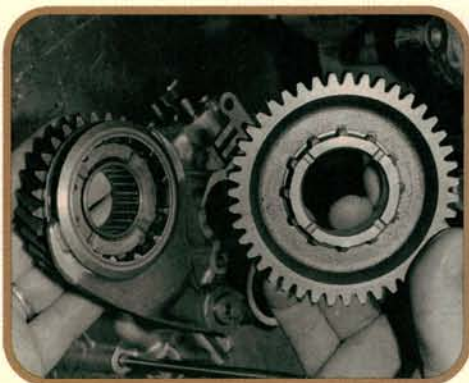
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Shift quality is also controlled hydraulically. Staggered arms on the throttle control shaft press against valves in the accumulator body. At part throttle, one valve is compressed to raise pressure behind the accumulator for crisper shifts. At full throttle, the other valve increases pressure even more.



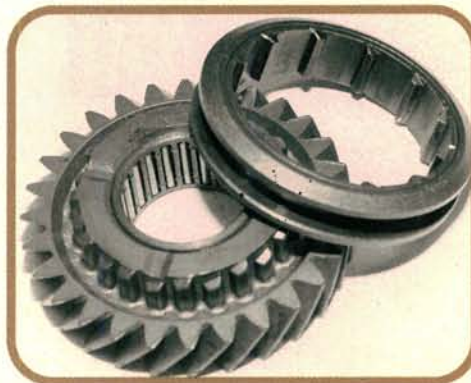
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Honda's approach to mainline pressure control is to use a stator input which rotates as torque increases during acceleration. The torque converter rotates the stator against this spring loaded valve in the pressure regulator valve body to increase mainline pressure during hard acceleration.



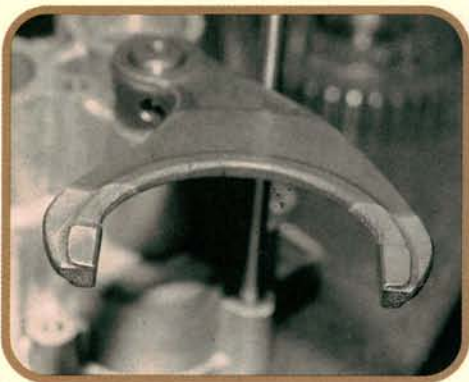
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And now for a few oddball problems. Countershaft reverse and 4th gears are selected when a servo activated fork shifts a selector hub to engage either reverse or 4th. The problems start when a stuck vehicle is "rocked" in snow or sand by rapidly shifting between a drive gear and reverse.



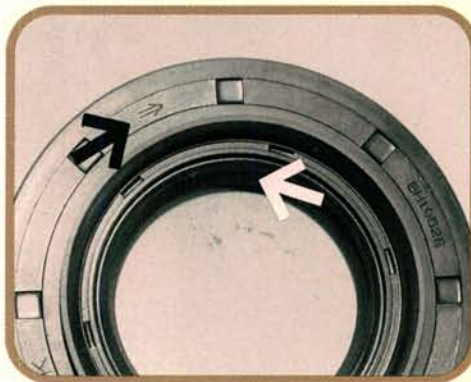
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Teeth on the hub are tapered, but there are no synchros. Banging back and forth between gears can cause a grinding engagement, chipping teeth from either gear, or from the hub itself. Once this happens, you have a ratcheting noise (or even grinding) as damaged teeth try to mesh when you select gears.



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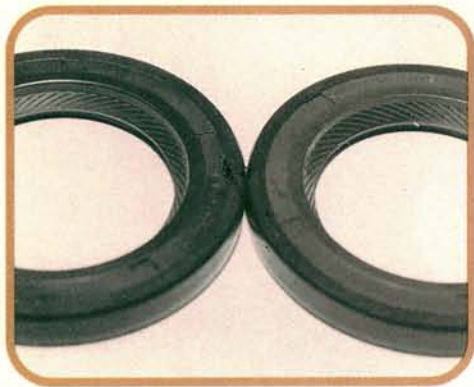
The selector fork can also end up bent which only makes the problem worse. If you have noise when manually selecting any forward gear (4th is engaged in all forward gears), or when selecting reverse, look for any signs of wear or damage. Some tranny techs replace all these parts if any are damaged.



18

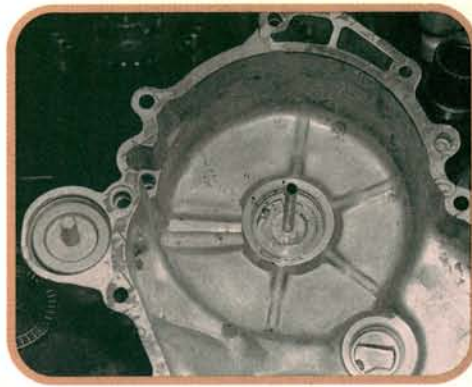
Watch those torque converter seals! Accord transaxles face East and Legends face West. So the embossed ribs (or helixes) on the torque converter sealing lip for each should also face in opposite directions. The arrow marking direction of converter rotation faces opposite the helixes.

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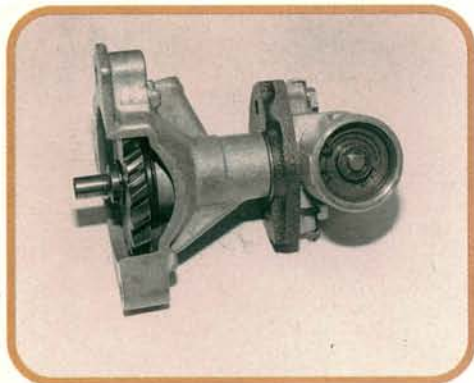
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Each Hondamatic uses two different diameter drive axle seals. The larger seal allows access to selective snap rings used to set ring gear sideplay. But on '88-'89 Integras and Civics, the big and little seals swapped sides. Side seals for the different versions are not interchangeable. Careful.



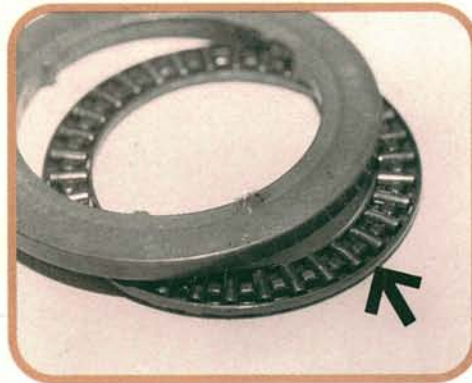
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Case half gaskets from Honda are a specific thickness. Some replacement gaskets which are too thick, or the use of tube sealer alone (too thin), can really screw up total end play. There are eight different case half gaskets available depending on case contours and bolt hole placements.



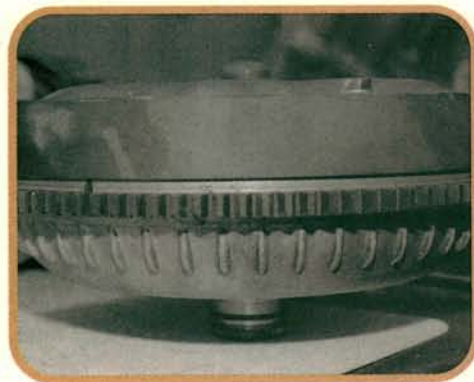
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Governors are buried in the unit, so make sure they are good before reassembly. Scored or debris-filled mechanical governors can stick. If there's any doubt about a governor sticking after inspection, replace it. Later, electronically controlled trans use a reluctor style speed sensor.



22

Thrust bearings have an "up" and a "down" face. Honda suggests that they be installed as shown, with the bearing cage lip edges facing the thrust washer. Carefully inspect all bearings, machined races in gears, and the surfaces of mating thrust washers for signs of wear or scoring.



23

If you're playing mix and match with used parts, check converter height. Some are short and some are tall (measuring overall height). Use a tall one in a "short" trans and you'll lock her up. Install a short converter in a "tall" trans and the teeth on the converter won't fully engage the stator.



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Flushing may not remove the debris trapped in a converter, and a fresh fill of ATF after a rebuild is the best way to dislodge any debris left from external flushing! A rebuilt converter may be good insurance in a very dirty trans. Some older Honda converters like this one could be disassembled for cleaning.