

Hyundai Accent Diagnostic process

-by Matt Hardy



This article covers the diagnostic process used to locate a fault within a 2002 Hyundai Accent. The complaint is the engine seems to "miss" during acceleration.

Step 1 Talk to the customer

Retrieve as much information as possible though don't allow them to set you in any particular direction. You are the technician not the owner.

Step 2 Assess the maintenance schedule

If the vehicle maintenance schedule is not complete, a

fault can often be rectified by performing the maintenance. Services and Tune ups are maintenance procedures, diagnosing a fault is another step further.

This vehicle was 7000kms over due for its last service.

Step 3 Drive the vehicle to confirm the fault is occurring

This is where your experience driving vehicles with faults come in, use all your senses. With practice you can "feel" when an ignition misfire occurs, take note if it feels like just one cylinder or more. Another clue is if it is a regular miss or seems to be random occurring on all cylinders, usually your ears will give you this information.

While accelerating this vehicle seemed to miss on one cylinder regularly, the beat from the exhaust plus the vibration

through the driveline were the best indicators.

Step 5 Set a diagnostic plan

Focusing on the Ignition system, start at the spark plug end or the coil primary end and work from one end to the other in a logical order. In this example I'll start at the spark plugs.



Step 6 Check spark plugs due to poor maintenance

On this particular Hyundai the spark plugs were well worn, this would be normally rectified during maintenance schedules. A weakness in an ignition system can make the coil work harder, shortening

its life.

I replaced the spark plugs, though continued to assess the ignition system.



Step 7 Test ignition leads by load testing

The best way to look for weaknesses in the remainder of the ignition system is to measure how much energy the coils can produce. By using an adjustable spark gap tester you can see how far the arc can jump across the gap. All outputs from the coil should be the same.

In this case cylinder one was unable to jump as far as the other leads. This would be the most likely cylinder to miss under load. Remember to look



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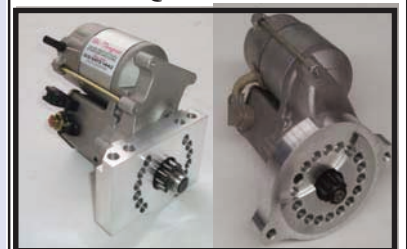
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for arcing from the sides of the lead especially on the tubes that run down to the plug.

Step 8 Test the resistance of the leads

To assess the quality of the lead, test the electrical resistance. The acceptable specification is 12Kohms per foot of lead.

The leads on this vehicle were showing signs of age though were within specifications.

Step 9 Test the current draw of each coil



Using a current clamp and oscilloscope you can see how much current is being switched by the ECM. This information can indicate shorts in the primary winding or a failing transistor in the ECU. Current too low would indicate a poor power source, bad connections or a faulty coil. Erratic switching of the coil would indicate a faulty ECM. The current should be identical on both coils.

In this case the current was identical and being switch cleanly by the ECM.

Step 10 Check for poor insulation of secondary winding

By dragging a jumper wire joined to earth over the coils, any poor insulation will allow the spark to arc to the earth lead. Performed using an insulated jump wire you should be at no risk of getting zapped. Using a fine mist of water from a spray bottle can also help see these flaws in the insulation.

When using the jump wire on these coils the spark was seen jumping from the iron core of the coils to the engine. This would be occurring during acceleration and even more frequently if the weather was raining.

Step 11 Replace unserviceable parts

Make your recommendations to the customer; when dealing with the ignition system it is always good practice to replace all components. If you can fail the coil and the spark plugs you may as well replace the leads to ensure no fault occurs in the near future. If you were to leave the leads as is a fault may occur, leaving your customer doubting your ability to rectify the initial fault.

Step 12 Test drive vehicle

Always test drive the vehicle

once components have been replaced. This will ensure you have fixed the problem and also assure you that you fitted everything correctly.

Conclusion

Record any other symptoms you may experience in the vehicle to pass on to the customer. Your customer may be used to a shimmy in the steering wheel, though they will surely appreciate knowing that a simple wheel balance can rectify the fault. Your aim should be to provide a safe, reliable vehicle and ensure your work diary is always full.



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