eq-10575493-8968

Subject: FW: 20140808: NHTSA Hyundai Codes, Recommend action plan
Date: Tuesday, August 12, 2014 8:39:39 AM
Attachments: 20131119 Sonata Recommended Action Plan.pdf
20140123 Recommended Action Plan.pdf

Subject: FW: 20140808: NHTSA Hyundai Codes, Recommend action plan

Can you please add the attached and below to VOQ# 10575493, public and private.

Thank you,

Please consider our environment before printing this e-mail.

From: [redacted]
Sent: Friday, August 08, 2014 4:12 PM
To: Reichard, Emily (NHTSA)
Subject: 20140808: NHTSA Hyundai Codes, Recommend action plan

See Attachments

November 2013 -FILE 20131119 Sonata Recommended Action Plan:
initial diagnosis - Driver's Seat Belt buckle REPLACE LEFT FRONT SEAT BELT BUCKLE ASSY. (FOUND LEFT FRONT SEAT BELT BUCKLE FAULTY B1701)

January 2014 - FILE 20140123 Sonata Recommend Action Plan:
- ongoing diagnosis B1701 (Driver's Buckle and/or pretensioner) and B1703 (harness and/or pretensioner)

- searching for Final Invoice for replacing whole interior harness -touches Air Bag System (dash, seats, buckles), Radio, HVAC, Rear Lights (brake, turn signals, backup lights, license plate)
Keep in mind what we discussed - once we rolled thru the process and eliminated ALL Codes, that led to the final action of replacing the whole harness

On Aug 8, 2014, at 12:11 PM, <Emily.Reichard@dot.gov> <Emily.Reichard@dot.gov> wrote:

Steven,

Please see below for my contact information. If you have any other questions or concerns please do not hesitate to contact me.

Drive safely,

Emily Reichard
Safety Defects Engineer
NHTSA- Office of Defects Investigation
1200 New Jersey Ave. SE W48-215
Washington, DC 20590
T-(202)366-4925 F-(202)366-1767

Steven Cooley,

Please use this guide as a helpful tool to navigate the recommendations that your technician has made on today's vehicle inspection. Your consultant Marty Stinett will follow up shortly to explain and prioritize what has been recommended:

GREEN - PASSED TASK indicates these components have been checked and are in proper working order

YELLOW - CAUTIONED TASK indicates a component on your vehicle will require attention in the near future. You can address these recommendations today for convenience, but no immediate action is needed:

- A part is close to the end of its useful life but still has time before replacement
- A part will most likely reach its wear/discard limit at the next scheduled service
- A maintenance service is recommended based on time or mileage
- To address components that do not effect vehicle safety or performance

RED - FAILED TASK indicates a component on your vehicle requires immediate attention. These recommendations should be performed today:

- A part no longer performs its intended purpose
- A part does not meet OEM (Original Equipment Manufacturer) design specifications
- A part has reached its wear/discard limit
- A part will reach its wear/discard limit before the next scheduled service
- A part is missing
- When fluids are contaminated, they have excessive debris, or are severely burnt

Thank you for the opportunity to earn your business,

Phil Long Hyundai Chapel Hills Service Team

Original Customer Requests

The following is what you requested we perform or investigate regarding your vehicle:

- ✓ A. CUST. STATES THE AIR BAG LIGHT IS ON? CHECK/ADVISE, HAS LETTER FOR RECALL IF NEEDED.
- ✓ B. PERFORM COMPLETE "WALK AROUND" MULTI POINT MPI INSPECTION.(COMPLIMENTARY)
- ✓ C. FREE EXTERIOR CAR WASH

Package Results

Phil Long Hyundai of Chapel Hill World Class Inspection

Failed Task	Observation	Recommendation
Check engine oil level and condition and check for leaks	Found engine oil to be dirty and low	Change engine oil and filter
Check engine coolant level and condition and check for leaks	Based on age/mileage	Perform coolant fluid exchange service
Check brake fluid level and condition and check for leaks	Based on age/mileage	Perform brake system fluid exchange
Inspect overall tire wear and condition	Found all tires abnormally worn	• Perform four wheel alignment • Mount and balance 4 new tires
Inspect malfunction indicator lamp (MIL) warning light	• Found check engine light illuminated • Found SRS (air bag) light illuminated	Diagnose check engine light
Inspect serpetine belt (drive belts)	Belt manufacturer recommends replacing belts every 4years or 60K miles (whichever comes first)	Replace serpetine belt
Inspect all hoses and clamps	Hose manufacturer recommends replacing hoses every 4years or 60K miles (whichever comes first)	• Replace lower radiator hose • Replace upper radiator hose
Measure left rear tire tread depth	2/32" or less	
Measure right rear tire tread depth	3/32" or Less	
Check automatic transmission fluid level and condition and check for leaks	Based on age/mileage	Perform automatic transmission fluid exchange service
Inspect front shocks and struts; check operation	Based on Time and Mileage	Replace front struts

Failed Task	Observation	Recommendation
Inspect rear shocks and struts; check operation	Based on Time and Mileage	Replace rear shock absorbers
Inspect air cleaner element	Found air cleaner element to be dirty	Replace air filter element
Inspect cabin air/HEPA filter (if equipped)	Cabin/HEPA filter replacement recommended every 15,000 miles	Replace cabin air/HEPA filter
Evap Canister	Evap canister replacement recommended every 36,000 miles	Replace Evap Canister
Fuel Filter	Fuel filter due for replacement based on manufacturer's recommendation	Replace Fuel Filter
Fuel Injection Service	Fuel injection service recommended every 15,000 miles	Perform Fuel Injection Service

Cautioned Task	Observation	Recommendation
Check power steering fluid level and condition and check for leaks	Based on age/mileage	Perform power steering system fluid exchange service
Inspect brake light(s) operation	Found burned out center (third) brake light bulb	Replace center (third) brake light bulb
Inspect tail light, turn signal, side marker, and license plate lights	Found burned out license plate bulb	Replace license plate bulb
Measure left front tire tread depth	5/32"	
Measure right front tire tread depth	5/32"	

Passed Task	Observation	Recommendation
Fill windshield washer fluid	Found washer fluid level low: Filled to proper level	
Check and adjust tire pressures	We set your tire pressure to factory specifications - no further action is required	
Perform battery performance test	Battery passes performance test	

Passed Tasks

- ✓ Inspect exhaust system for leaks, damage, and loose parts
- ✓ Inspect axles, driveshaft(s) U-joints and CV joints/boots
- ✓ Inspect transmission mount(s)
- ✓ Fill windshield washer fluid
- ✓ Inspect hazard light(s) operation
- ✓ Inspect back-up light(s) operation

- ✓ Inspect taillight, turn signal, and side marker assemblies for cracks and damage
- ✓ Inspect headlight low and bright beam operation
- ✓ Inspect windshield wiper/washer operation
- ✓ Inspect horn operation
- ✓ Inspect dash and interior lights operation
- ✓ Check and adjust tire pressures
- ✓ Inspect all vehicle wiper blades
- ✓ Perform battery performance test
- ✓ Inspect battery terminals and cables
- ✓ Inspect steering and sway bar components
- ✓ Inspect suspension components
- ✓ Check windshield and glass for cracks, chips, and pitting

Additional Observations	Recommendation
FOUND LEFT FRONT SEAT BELT BUCKLE FAULTY B1701	• SCAN TOOL AND DIAG TEST • REPLACE LEFT FRONT SEAT BELT BUCKLE ASSY.
BASED ON MILAGE	• REPLACE SPARK PLUGS AND INTAKE GASKET • PERFORM DECARB AND THROTTLE BODY SERVICE
FOUND RIGHT REAR HUB LOOSE	REPLACE RIGHT REAR HUB ASSY
WITH PURCHASE OF TIRES	PERFORM NITROGEN SERVICE

Previously Declined Recommendations

We have kept a close watch on your maintenance history and believe that these previously recommended actions should still be performed:

Recommendation	Declined	Approved
Replace canister filter		
Replace front struts		
Replace rear shock absorbers		
Replace air filter element		

Additional Information

Below is information we feel would help you better understand some of the reasons for taking preventive maintenance steps -- steps that help to ensure the reliability and safety of your vehicle for you and your family.

** The following section may contain instructions for servicing various components of your vehicle. These are an overview of the process that will be performed by a skilled technician in our shop. They are not intended to be a guide for a “do-it-yourself” operation.

Oil and filter change — AI-3

Operation Description:

Completely drain all oil from the engine. Reinstall the oil drain plug using a new oil drain plug gasket, and torque the drain plug to the vehicle manufacturer's specifications. Remove the oil filter from the engine. Lubricate the seal on the new filter using clean motor oil. Install the new oil filter on the engine and tighten it to specification. Refill the engine with the correct amount of motor oil specified by the manufacturer. Start the engine and allow it run for over 30 seconds. Shut the engine off and check for any oil leaks beneath the vehicle. Check the oil level. Top off as necessary.

Sludge from lack of oil changes

Significance:

Changing your engine oil and filter is the single most important vehicle maintenance that you can perform to ensure long engine life. Engine oil that is not changed when is should can develop sludge which can cause serious engine damage in less than 15,000 miles. Today's engine oils have additives and detergents that help to prevent sludge formation, but engine heat will eventually break down these additives so they can no longer protect your engine. The solution is to change your engine oil and filter at the recommended service intervals to ensure that your engine runs reliably for many years.

Clean, maintained engine internals

Advantage:

Changing your engine oil and filter at or before the factory recommended service interval is the best way to protect your engine from premature wear or complete failure. Today's modern engines commonly last far beyond 100,000 miles when they are properly maintained with regular oil and filter changes. An oil and filter change is an inexpensive way to promote engine longevity and ensure good engine performance.

Check engine light on — AI-8

Operation Description:

One of our skilled technicians will connect a specialized scan tool to the vehicle. This scan tool will read any powertrain or tranmission diagnostic trouble codes stored in the vehicle's memory. Using these trouble codes, the technician can troubleshoot the cause of the trouble codes and then make the necessary repairs. When the repair is completed, the the powertrain or transmission controller is cleared of all stored codes, and then the vehicle is driven under the correct conditions to verify the problem has been repaired.

Check Engine light on

Significance:

When a vehicle's Check Engine light is on, this indicates that a significant problem with the emission control system has been detected by one or more of the vehicle controllers. In many states, your vehicle will fail the emissions inspection if the Check Engine light is on. The Check Engine light is your vehicle's way of telling you that it has detected a problem that is affecting the level of emissions released from your vehicle. If problems associated with the Check Engine light are not diagnosed and repaired in a timely fashion, expensive repairs may result. You may also run the risk of your car not starting, or stalling under various conditions.

Scanning vehicle for trouble codes

Advantage:

When your Check Engine light is on, it indicates a problem that needs to be addressed immediately. Repairing the problem right away can ensure that your vehicle continues to be reliable, and can help to avoid costly repairs in the future.

Belt replacement - serp, acc, fan, drive, v — AI-11

Operation Description:

Loosen the drive belt tensioner and remove the old belt. Inspect the tensioner and idler pulley bearings for noise or signs of wear. Inspect tensioner and idler pulleys. Install the new belt. Start the engine, and after a minute or so, shut the engine off. Recheck the belt tension and make final adjustments as necessary.

Worn accessory drive belt

New accessory drive belt

Significance:

The accessory drive belts on your vehicle perform many functions. The power steering system, alternator (charging system), and AC system are all driven by accessory drive belts. On some vehicles, accessory drive belts also drive the water pump, engine cooling fan, and air injection pump (emission control). Accessory drive belts wear during normal engine operation, and need to be checked and replaced periodically; you can lose one or more systems if a belt is broken. A broken fan or waterpump belt can cause severe overheating which could result in expensive repairs, or even total engine failure. A broken power steering belt can result in the loss of your vehicle's power steering system, which could make your vehicle very difficult to steer. A broken alternator belt could cause your vehicle to lose all of its electrical power, and could eventually result in a dead battery.

Advantage:

Make sure that the drive belts on your vehicle are in good condition. This is an important point to keep in mind as you attempt to keep your vehicle reliable and safe. Drive belt replacement is recommended at certain mileage intervals. This step can also save you money by avoiding possible engine damage and costly engine repairs.

Cooling system hose replacement AI-16

Operation Description:

Drain the cooling system. Remove the damaged hose. Inspect the hose clamps for damage. Replace the defective hose with a new hose. Tighten the hose clamps. Fill engine and radiator with approved engine coolant. Perform a pressure test of the cooling system to ensure that there are no leaks. Run the engine until it reaches normal operating temperature. Top off the coolant as necessary.

Worn out cooling hose

Significance:

The cooling system hoses allow the engine coolant (antifreeze) to circulate from the engine to the radiator and back. They also allow coolant to flow from the engine through the heater core. Cooling system hoses can swell and become weak over time. Even during normal driving conditions, the engine cooling hoses need to be periodically inspected and replaced as part of a scheduled vehicle maintenance program. If a neglected cooling hose bursts while you are driving, the engine can lose all of its coolant and overheat. The result can be expensive engine damage.

New cooling hose

Advantage:

Making sure that the coolant hoses on your vehicle are in good condition is an important factor in keeping your vehicle reliable and running properly. Replacing coolant hoses at recommended intervals can also save you money by avoiding possible engine damage and costly engine repairs.

Cabin filter replacement AI-18

Operation Description:

Access the cabin or pollen filter according to the vehicle manufacturer's service information. This usually involves opening the glove box and removing the bolt to lower the door. Remove the old cabin air filter from its housing. Replace with new cabin air filter. Replace the bolt to attach the glove box door. Close the glove box door. Clean the housing of all dust and debris. Install the new pollen filter into its housing.

A dirty and clogged cabin air filter

Significance:

The cabin or pollen filter is designed to filter out dust, pollen and other particles that would normally make their way into your vehicle through the heating, ventilation and air conditioning (HVAC) systems. Pollen filters work very well, but need to be replaced as part of a scheduled maintenance program. Restricted and dirty pollen filters put a strain on the blower motor, which can cause it to be excessively noisy and even fail prematurely. This kind of strain on a blower motor can also cause problems with the vehicle wiring and electrical system, due to the excessive amperage required for the blower motor to function. Replacing the blower motor can be very expensive on some vehicles.

A clean cabin air filter

Advantage:

A clean cabin or pollen filter can be very effective at keeping dust, pollen, and other unwanted particles from entering the interior of your car. Also, your blower motor will generate a higher volume of airflow, boosting the efficiency and effectiveness of your HVAC systems.

MacPherson strut replacement AI-22

Operation Description:

Note: MacPherson Struts should always be replaced in pairs. Lift the vehicle. Remove the wheels. Remove the strut and spring assembly from the vehicle. Using a strut spring compressor, carefully compress the coil spring and disassemble the strut assembly. Remove the strut cap and bearing, and inspect them for damage or wear. If the bearing or cap is damaged or worn, it must be replaced. Remove the strut insert from the strut assembly. Install the new strut insert. Reinstall the coil spring and cap and bearing. Carefully decompress the coil spring. Install the strut and spring assembly back onto the vehicle. Reinstall the wheel and torque the lug nuts to the correct torque specification. Perform a complete wheel alignment.

Worn out MacPherson struts

MacPherson struts

Significance:

When struts wear out, your vehicle will bounce too much when going over bumps. It will also sway excessively while moving through a turn. Worn out struts can lead to serious handling problems with your vehicle, and this presents a safety issue. Your vehicle may even handle in an unpredictable manner. Worn out struts can also cause your tires to wear unevenly, greatly reducing the life of your tires. You should replace your struts before they get to this point.

Advantage:

The MacPherson strut is widely used in modern vehicles. It combines a shock absorber and a coil spring into a single unit, which provides a more compact and lighter suspension system great for front-wheel drive vehicles. Good struts will help you stay safe, ride comfortably, and prevent your tires from wearing out quickly.

Tire replacement AI-23

Operation Description:

Raise the vehicle using an automotive lift. Remove the rim and tire assembly from the vehicle. Remove the tire from the rim. Install a new valve stem assembly. Install a new tire on the rim. Inflate the tire to recommended pressure. Balance the tire and rim assembly on a computer-aided dynamic tire balancing machine. Reinstall the tire and rim assembly onto the vehicle. Torque the wheel retaining nuts to the vehicle manufacturer's specifications.

Signs of irregular tire wear

Significance:

Your vehicle's tires are the only connection between your vehicle and the road. Safe vehicle operation depends on your tires being in good condition. If your tires are neglected, the tread can wear completely away, leaving the tire bald and often exposing the steel cords. Not only is this condition dangerous, it is also unlawful in many states. Tires with an abnormal tread wear pattern can cause the vehicle to shimmy and vibrate, and can adversely affect the manner in which your vehicle performs. A tire with an abnormal tread wear pattern will no longer contact the road the way that it was designed to, and this condition can be dangerous, especially during adverse road conditions.

New tire

Advantage:

Replacing worn tires is part of vehicle maintenance that is necessary to ensure that your driving experience is as safe as possible. Besides the obvious safety benefits, tires that are in good condition and properly inflated to the correct air pressure can increase the overall fuel economy and help provide a comfortable ride.

Shock absorber replacement AI-24

Operation Description:

Note: Shock absorbers should always be replaced in pairs. Carefully lift the vehicle using an approved automotive lift. Remove the wheel that corresponds with the shock that is going to be replaced. Follow the vehicle manufacturer's service information and remove the shock absorber from the vehicle. Inspect the shock mounting points on the vehicle for wear or damage and make repairs as necessary. Install the new shock absorber. Reinstall the wheel and torque the lug nuts to the correct torque specification.

Uneven tire wear due to worn shock absorbers

Significance:

When a shock absorber wears out, your vehicle will bounce too much when going over bumps. It will also sway excessively when you go into a turn. Worn out shocks can lead to serious handling problems with your vehicle, and this presents a safety issue. Additionally, your vehicle may handle in an unpredictable manner. Worn out shocks will also cause your tires to wear unevenly, greatly reducing the life of your tires. You should replace your shock absorbers before they get to this point.

New shock absorber

Advantage:

Replacing your worn out shock absorbers can greatly improve how your vehicle handles, making your vehicle more predictable and safer to drive. It will also prevent the premature tire wear that is associated with worn out shock absorbers.

Air filter replacement AI-28

Operation Description:

Remove the air filter element from the air filter housing. Clean the air filter housing and inspect the fresh air duct hose for damage, dirt, or obstructions. Inspect the warm air intake hose for signs of deterioration. Install a new filter element, and then reinstall the air filter housing access panel.

Dirty and restricted air filter

Significance:

A dirty or clogged air filter can affect the fuel economy and overall vehicle performance. Both diesel and gasoline powered engines are designed to maintain a specific air-fuel ratio. A restricted air filter can affect the way the engine maintains the correct air-fuel mixture. If the air filter is restricted, the fuel mileage and overall vehicle drivability can deteriorate rapidly.

New air filter

Advantage:

Replacing your air filter element is a quick and effective way to keep your engine running at its peak performance. A clean air filter helps your engine work more efficiently by letting the airflow get to the engine with no restrictions. A clean air filter can also prolong the life of your engine.

Fuel filter replacement AI-29

Operation Description:

Depressurize the fuel system. Remove the fuel filter retaining straps and disconnect the fuel feed and supply lines. Install a factory-approved replacement filter, and then reinstall the retaining components. Check for signs of damage to the fuel lines or connections.

Old fuel filter

Significance:

Fuel filters play a crucial role in your engine's performance. If the filter becomes restricted, the engine will starve for fuel and not perform properly. Damaged fuel filters can allow debris to flow through the lines and clog the pressure regulator and fuel injectors. Fuel filters have a life expectancy of about five years. It is important to replace it at the recommended service interval.

New fuel filter

Advantage:

Factory replacement parts are designed to work in a specific system by the vehicle manufacturer. Proper filtration of fuel that enters the carburetor or fuel injection system is mandatory to keep your engine performing like new.

Wheel alignment AI-35

Operation Description:

Inspect the front and rear suspension components for any signs of wear or damage. Using specialized wheel alignment equipment, adjust the suspension and wheels to the vehicle manufacture's specifications.

Abnormal tire wear from bad alignment

Significance:

Vehicle suspensions can wear with age and repeated heavy use. Rough road surfaces and an occasional pothole can change the vehicle's wheel alignment. A wheel alignment can improve your steering control and overall vehicle handling. It can also help prevent abnormal tire wear by bringing the vehicle suspension components back to the vehicle manufacturer's specifications. This important step will keep your vehicle driving the way it was designed to. An alignment is necessary any time a worn suspension part is replaced.

Wheel alignment

Advantage:

Even slightly worn suspension components can affect the vehicle's wheel alignment. This can lead to premature wear of tires and reduce overall vehicle comfort and safety. A vehicle with worn-out suspension parts can be unsafe to drive. Maintaining your vehicle suspension and performing regular wheel alignments and tire rotations can keep your vehicle safe and reliable.

Bulb replacement AI-41

Operation Description:

Perform a function test of entire lighting system. Visually inspect the headlamps, high and low beams, hazard signals, turn indicators, parking lights and brake lights. Remove and install new light bulbs as needed to repair inoperative vehicle lamps.

Burned-out light bulbs

Significance:

Lighting systems are required on all vehicles by both state and federal laws. Lights are a major contributor to your safety, not only by allowing you to see the road in front of you at night, but also by allowing other vehicles to see you. The value of having fully-functioning lights far outweighs the cost of replacing burned-out light bulbs. The cost is normally less than the inconvenience and can also prevent you from receiving a traffic citation.

New light bulb

Advantage:

The vehicle lighting system is an important safety feature of your car. Replacing burned out light bulbs is an inexpensive way to ensure that your driving experience is a safe one.

Coolant fluid exchange service AI-59

Operation Description:

Some coolant may be in such poor condition that a coolant flush is necessary to remove the corrosion and deposits that were created in the engine and the radiator. If so, an approved coolant removal and cycling machine is required for this procedure. Our trained technician will connect the vehicle to a state-of-the-art machine and add a cleaner to safely remove rust, sludge and scale deposits. Once the system has been cleaned, the technician will install a new coolant-and-water mix, along with a conditioner to protect the cooling system. Once this is finished, the engine will be allowed to run until it reaches normal operating temperature and then the fluid will be checked and adjusted if necessary.

Clean vs. dirty, acidic coolant (antifreeze)

Coolant flush equipment

Significance:

The engine’s coolant pulls the heat from the engine and then dissipates the heat when it enters the radiator. The engine's cooling system is a complex system comprised of many components and materials. The most common materials used are aluminum, plastic, copper, brass, rubber, and steel. The engine coolant must be compatible with all of them. The engine coolant is designed to transfer heat, stop corrosion, and provide a lubricant for the water pump seal. Old antifreeze can become acidic. The combination of acidic fluid and the dissimilar alloys in the cooling system actually creates a crude battery. This condition can cause accelerated corrosion of these materials. Changing the coolant according to a preventative maintenance schedule will prevent this acidic condition, and help prevent corrosion, and expensive future repairs.

Advantage:

Replacing the engine coolant as a part of a scheduled maintenance program is essential to your vehicle's reliability and longevity. New engine coolant has a non-acidic, non-corrosive PH level that will not destroy your cooling system components. The use of proper engine coolant will help keep your engine from overheating, and can help prevent the engine from freezing during cold weather conditions.

ATF fluid exchange without filter — AI-60

Operation Description:

Using a state-of-the-art machine, one of our specially trained technicians will use a safe and effective cleaner to dissolve and suspend the varnish and gums in the transmission, valve body, torque converter, pan, filter element, transmission lines, and transmission cooler. The technician will then flush the entire unit of all old fluid and suspended debris and install new transmission fluid of the proper specification and fortify the new fluid with seal conditioners, oxidation inhibitors and friction modifiers. Finally, he will run the vehicle to operating temperature and ensure that the automatic transmission fluid is filled to the correct level.

Valve body spool with heavy build up

Significance:

When was the last time you had your vehicle's transmission serviced? Have you experienced slipping, hard shifting, or chattering? All of this can indicate that an automatic transmission flush service is needed.

Valve body spool after transmission service

Advantage:

By having your automatic transmission cleaned and its fluid replaced every 2 years or 30,000 miles, you can keep the transmission running efficiently, restore transmission fluid circulation, help prevent overheating, smooth shifting and transmission operation, and reduce transmission wear. All of this helps you avoid costly future repairs to the transmission.

Power steering fluid exchange service AI-62

Operation Description:

One of our skilled technicians with specialized equipment will use a powerful cleaner to dissolve and suspend the varnish and gums in your vehicle's power steering unit and then flush the entire unit of all old fluid and contaminants and install new high-tech fluid for both conventional sector and rack and pinion. Finally, the technician will road test your vehicle.

Power steering spool valve with hardened cracked seals

Significance:

If you have experienced steering pump noises, hard or erratic steering, or pump leaks, it's probably time to have your vehicle's power steering system serviced. The power steering pump produces high pressures (between 800–2,000 lbs./400 – 1,000 kg, depending on model) and high heat. Heat + pressure = fluid breakdown/failure; fluid failure = power steering pump and/or rack failure; power steering pump and/or rack failure = costly repair.

Grooves worn into the housing by hardened seals

Advantage:

Our power steering service will alleviate steering squeal caused by sticking valves, correct that jerky feeling on the steering wheel, help prevent fluid leaks, and reduce wear.

Brake fluid exchange service AI-63

Operation Description:

One of our skilled technicians will check the condition of your vehicle's brake fluid and, if necessary, remove contaminated fluid from the brake lines and master cylinder, replace the old fluid with appropriate brake fluid. The entire brake system will be inspected for leaks, master cylinder corrosion, worn pneumatic parts, harmful varnish build-up, broken or rusted bleeder valves, worn rotors and drums, and air in the brake lines.

Harmful deposits on brake master cylinder piston assembly

Significance:

Does your vehicle's brake pedal feel "spongy"? Brake fluid becomes contaminated over time and use. Heat and moisture can cause brake failure. Contaminated fluid leads to expensive repairs.

Brake fluid before and after service

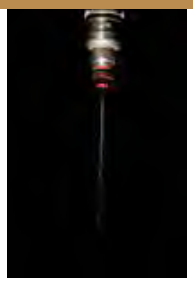
Advantage:

Worn-out, oxidized brake fluid causes corrosion and harmful deposits and varnish build up. A brake flush service should be performed when your brake fluid shows contamination or every 30,000 to 40,000 miles.

Fuel injector cleaning — AI-71

Operation Description:

Injectors can be cleaned in several different ways depending on the severity of the problem, your type of vehicle, and the particular equipment your service facility uses. The quickest and easiest is a solvent put in the gasoline, but anything that can go in the gas tank will be diluted and thus not have the strength to actually clean an injector, although it may help the injector from clogging with regular use. The most common cleaning method is a high-pressure, "on the car" cleaning process where special equipment is hooked up to the fuel intake and a powerful solvent is injected under high pressure through the fuel injectors to clean out the stubborn deposits. The most aggressive method is to remove the injectors and have them cleaned "off the car" which usually is not cost effective except in very specific situations.



Poor spray pattern

Good atomization

Significance:

The efficiency of your vehicle is very dependent on the proper atomization or spray pattern that the fuel injector is responsible for. As little as an 8 or 10% restriction in an injector can adversely affect your engine's performance by not allowing the gasoline entering the combustion chamber to be burnt effectively, losing part of the energy that was available, but not burned.

Advantage:

Fuel injectors are the single most important component in the fuel system to keep your engine running efficiently and getting the most performance and mileage from every ounce of gasoline.

Bulb replacement - license — AI-79

Operation Description:

The technician will remove the license plate assembly and determine if it can simply be cleaned or if it must be replaced. The technician disconnects and inspects the wiring and connectors to ensure that the corrosion has not contaminated these. Once the electrical components of the new assembly have been reconnected, the technician will install a new bulb and reassemble the part into the deck lid assembly.

License plate bulb disassembled

Significance:

Most laws require that vehicles maintain lights on the license plate at all times after dark. This not only helps with the visibility of your car, but it also saves you from getting an unnecessary ticket.

Working license plate bulbs

Advantage:

The old and corroded bulb assembly will, if left unattended, create unneccesary resistence in that wiring circuit. This is dangeous as it will continue to burn out bulbs and could cause other damage such as melted wires, corrosion in the wiring harness, and shorts in the elctrical components. It is wise to maintain this system of your vehicle.

Recommended Services

Our technicians recommend the following services for your vehicle.

Original Customer Requests	Status	Cost	Declined	Approved
A. CUST. STATES THE AIR BAG LIGHT IS ON? CHECK/ADVISE, HAS LETTER FOR RECALL IF NEEDED.				X
B. PERFORM COMPLETE "WALK AROUND" MULTI POINT MPI INSPECTION.(COMPLIMENTARY)				X
C. FREE EXTERIOR CAR WASH				X

Inspection & Additional Recommendations	Insp	Status	Cost	Declined	Approved
Replace Evap Canister (Evap canister replacement recommended every 36,000 miles)	x	Fail	$86.00		
Change engine oil and filter (Found engine oil to be dirty and low)	x	Fail	$29.95		*See AI-3*
Diagnose check engine light (Found check engine light illuminated)	x	Fail	$95.00		*See AI-8*
Replace serpetine belt (Belt manufacturer recommends replacing belts every 4years or 60K miles (whichever comes first))	x	Fail	$174.16		*See AI-11*
Replace lower radiator hose (Hose manufacturer recommends replacing hoses every 4years or 60K miles (whichever comes first))	x	Fail	$159.99		*See AI-16*
Replace upper radiator hose (Hose manufacturer recommends replacing hoses every 4years or 60K miles (whichever comes first))	x	Fail	$108.42		*See AI-16*
Replace cabin air/HEPA filter (Cabin/HEPA filter replacement recommended every 15,000 miles)	x	Fail	$39.95		*See AI-18*
Replace front struts (Based on Time and Mileage)	x	Fail	$508.87		*See AI-22*
Mount and balance 4 new tires (Found all tires abnormally worn)	x	Fail	$534.00		*See AI-23*
Replace rear shock absorbers (Based on Time and Mileage)	x	Fail	$341.87		*See AI-24*
Replace air filter element (Found air cleaner element to be dirty)	x	Fail	$20.95		*See AI-28*
Replace Fuel Filter (Fuel filter due for replacement based on manufacturer's recommendation)	x	Fail	$99.95		*See AI-29*
Perform four wheel alignment (Found all tires abnormally worn)	x	Fail	$79.95		*See AI-35*

Inspection & Additional Recommendations	Insp	Status	Cost	Declined	Approved
Perform coolant fluid exchange service (Based on age/mileage)	x	Fail	$130.25		*See AI-59*
Perform automatic transmission fluid exchange service (Based on age/mileage)	x	Fail	$178.01		*See AI-60*
Perform brake system fluid exchange (Based on age/mileage)	x	Fail	$120.10		*See AI-63*
Perform Fuel Injection Service (Fuel injection service recommended every 15,000 miles)	x	Fail	$98.95		*See AI-71*
SCAN TOOL AND DIAG TEST (FOUND LEFT FRONT SEAT BELT BUCKLE FAULTY B1701)		Fail	$95.00		
REPLACE LEFT FRONT SEAT BELT BUCKLE ASSY. (FOUND LEFT FRONT SEAT BELT BUCKLE FAULTY B1701)		Fail	$334.97		
REPLACE SPARK PLUGS AND INTAKE GASKET (BASED ON MILAGE)		Fail	$427.43		
PERFORM DECARB AND THROTTLE BODY SERVICE (BASED ON MILAGE)		Fail	$143.87		
REPLACE RIGHT REAR HUB ASSY (FOUND RIGHT REAR HUB LOOSE)		Fail	$329.87		
Replace center (third) brake light bulb (Found burned out center (third) brake light bulb)	x	Caution	$100.00		*See AI-41*
Perform power steering system fluid exchange service (Based on age/mileage)	x	Caution	$74.87		*See AI-62*
Replace license plate bulb (Found burned out license plate bulb)	x	Caution	$48.87		*See AI-79*
PERFORM NITROGEN SERVICE (WITH PURCHASE OF TIRES)		Caution	$39.95		

Previously Declined Recommendations	Status	Cost	Declined	Approved
Replace canister filter		$102.90		
Replace front struts	Fail	$240.00		*See AI-22*
Replace rear shock absorbers	Fail	$240.00		*See AI-24*
Replace air filter element	Fail	$24.95		*See AI-28*

Totals, Taxes and Fees	Cost	Declined	Approved
Estimate Subtotal	$5,009.05	$0.00	$0.00
Shop Fees Hyundai	$65.00		
Tax	$370.67		
Estimate Total	**$5,444.72**		

For "See AI-" items  *see the "Additional Info*

Steven Cooley,

Please use this guide as a helpful tool to navigate the recommendations that your technician has made on today's vehicle inspection. Your consultant Marty Stinett will follow up shortly to explain and prioritize what has been recommended:

GREEN - PASSED TASK indicates these components have been checked and are in proper working order

YELLOW - CAUTIONED TASK indicates a component on your vehicle will require attention in the near future. You can address these recommendations today for convenience, but no immediate action is needed:

- A part is close to the end of its useful life but still has time before replacement
- A part will most likely reach its wear/discard limit at the next scheduled service
- A maintenance service is recommended based on time or mileage
- To address components that do not effect vehicle safety or performance

RED - FAILED TASK indicates a component on your vehicle requires immediate attention. These recommendations should be performed today:

- A part no longer performs its intended purpose
- A part does not meet OEM (Original Equipment Manufacturer) design specifications
- A part has reached its wear/discard limit
- A part will reach its wear/discard limit before the next scheduled service
- A part is missing
- When fluids are contaminated, they have excessive debris, or are severely burnt

Thank you for the opportunity to earn your business,

Phil Long Hyundai Chapel Hills Service Team

Original Customer Requests

The following is what you requested we perform or investigate regarding your vehicle:

- ✓ A. C/S: CUST. STATES THE AIR BAG LIGHT IS ON AND NO CODES IN MEMORY? CHECK/ADVISE (VERIFY AIRBAG LIGHT STAYS ON. PERFORM SCAN TOOL TEST. NO CODES. INSPECT AIRGAG LIGHT CIRCUIT FOR SHORTS. R&R CENTER CONSOLE AND RADIO TO INSPECR AND VERIFY POSSIBLE WIRING DAMAGE. NONE FOUND. INSPECT AIRBAG MODULE CONNECTOR AND FOUND SHORTING BAR TO)
- ✓ DIAG
- ✓ REPLACE DRIVER SEATBELT ASSY
- ✓ B. PERFORM COMPLETE "WALK AROUND" MULTI POINT MPI INSPECTION.(COMPLIMENTARY)
- ✓ C. FREE EXTERIOR CAR WASH

Package Results

Phil Long Hyundai of Chapel Hill World Class Inspection

Passed Tasks

✓ Inspect horn operation

Previously Declined Recommendations

We have kept a close watch on your maintenance history and believe that these previously recommended actions should still be performed:

Recommendation	Declined	Approved
Replace canister filter		
PERFORM DECARB AND THROTTLE BODY SERVICE		
PERFORM NITROGEN SERVICE		
REPLACE LEFT FRONT SEAT BELT BUCKLE ASSY.		
REPLACE RIGHT REAR HUB ASSY		
REPLACE SPARK PLUGS AND INTAKE GASKET		
SCAN TOOL AND DIAG TEST		
Perform power steering system fluid exchange service		
Change engine oil and filter		
Perform coolant fluid exchange service		

Recommendation	Declined	Approved
Perform brake system fluid exchange		
Replace center (third) brake light bulb		
Replace license plate bulb		
Perform four wheel alignment		
Mount and balance 4 new tires		
Diagnose check engine light		
Replace air filter element		
Replace front struts		
Replace rear shock absorbers		
Perform automatic transmission fluid exchange service		
Replace serpetine belt		
Replace lower radiator hose		
Replace upper radiator hose		
Replace air filter element		
Replace front struts		
Replace rear shock absorbers		
Replace cabin air/HEPA filter		
Perform Fuel Injection Service		
Replace Evap Canister		
Replace Fuel Filter		

Additional Information

Below is information we feel would help you better understand some of the reasons for taking preventive maintenance steps -- steps that help to ensure the reliability and safety of your vehicle for you and your family.

** The following section may contain instructions for servicing various components of your vehicle. These are an overview of the process that will be performed by a skilled technician in our shop. They are not intended to be a guide for a “do-it-yourself” operation.

Oil and filter change AI-3

Operation Description:

Completely drain all oil from the engine. Reinstall the oil drain plug using a new oil drain plug gasket, and torque the drain plug to the vehicle manufacturer's specifications. Remove the oil filter from the engine. Lubricate the seal on the new filter using clean motor oil. Install the new oil filter on the engine and tighten it to specification. Refill the engine with the correct amount of motor oil specified by the manufacturer. Start the engine and allow it run for over 30 seconds. Shut the engine off and check for any oil leaks beneath the vehicle. Check the oil level. Top off as necessary.

Sludge from lack of oil changes

Significance:

Changing your engine oil and filter is the single most important vehicle maintenance that you can perform to ensure long engine life. Engine oil that is not changed when is should can develop sludge which can cause serious engine damage in less than 15,000 miles. Today's engine oils have additives and detergents that help to prevent sludge formation, but engine heat will eventually break down these additives so they can no longer protect your engine. The solution is to change your engine oil and filter at the recommended service intervals to ensure that your engine runs reliably for many years.

Clean, maintained engine internals

Advantage:

Changing your engine oil and filter at or before the factory recommended service interval is the best way to protect your engine from premature wear or complete failure. Today's modern engines commonly last far beyond 100,000 miles when they are properly maintained with regular oil and filter changes. An oil and filter change is an inexpensive way to promote engine longevity and ensure good engine performance.

Check engine light on AI-8

Operation Description:

One of our skilled technicians will connect a specialized scan tool to the vehicle. This scan tool will read any powertrain or tranmission diagnostic trouble codes stored in the vehicle's memory. Using these trouble codes, the technician can troubleshoot the cause of the trouble codes and then make the necessary repairs. When the repair is completed, the the powertrain or transmission controller is cleared of all stored codes, and then the vehicle is driven under the correct conditions to verify the problem has been repaired.

Check Engine light on

Significance:

When a vehicle's Check Engine light is on, this indicates that a significant problem with the emission control system has been detected by one or more of the vehicle controllers. In many states, your vehicle will fail the emissions inspection if the Check Engine light is on. The Check Engine light is your vehicle's way of telling you that it has detected a problem that is affecting the level of emissions released from your vehicle. If problems associated with the Check Engine light are not diagnosed and repaired in a timely fashion, expensive repairs may result. You may also run the risk of your car not starting, or stalling under various conditions.

Scanning vehicle for trouble codes

Advantage:

When your Check Engine light is on, it indicates a problem that needs to be addressed immediately. Repairing the problem right away can ensure that your vehicle continues to be reliable, and can help to avoid costly repairs in the future.

Belt replacement - serp, acc, fan, drive, v — AI-11

Operation Description:

Loosen the drive belt tensioner and remove the old belt. Inspect the tensioner and idler pulley bearings for noise or signs of wear. Inspect tensioner and idler pulleys. Install the new belt. Start the engine, and after a minute or so, shut the engine off. Recheck the belt tension and make final adjustments as necessary.

Worn accessory drive belt

Significance:

The accessory drive belts on your vehicle perform many functions. The power steering system, alternator (charging system), and AC system are all driven by accessory drive belts. On some vehicles, accessory drive belts also drive the water pump, engine cooling fan, and air injection pump (emission control). Accessory drive belts wear during normal engine operation, and need to be checked and replaced periodically; you can lose one or more systems if a belt is broken. A broken fan or waterpump belt can cause severe overheating which could result in expensive repairs, or even total engine failure. A broken power steering belt can result in the loss of your vehicle's power steering system, which could make your vehicle very difficult to steer. A broken alternator belt could cause your vehicle to lose all of its electrical power, and could eventually result in a dead battery.

New accessory drive belt

Advantage:

Make sure that the drive belts on your vehicle are in good condition. This is an important point to keep in mind as you attempt to keep your vehicle reliable and safe. Drive belt replacement is recommended at certain mileage intervals. This step can also save you money by avoiding possible engine damage and costly engine repairs.

Cooling system hose replacement AI-16

Operation Description:

Drain the cooling system. Remove the damaged hose. Inspect the hose clamps for damage. Replace the defective hose with a new hose. Tighten the hose clamps. Fill engine and radiator with approved engine coolant. Perform a pressure test of the cooling system to ensure that there are no leaks. Run the engine until it reaches normal operating temperature. Top off the coolant as necessary.

Worn out cooling hose

Significance:

The cooling system hoses allow the engine coolant (antifreeze) to circulate from the engine to the radiator and back. They also allow coolant to flow from the engine through the heater core. Cooling system hoses can swell and become weak over time. Even during normal driving conditions, the engine cooling hoses need to be periodically inspected and replaced as part of a scheduled vehicle maintenance program. If a neglected cooling hose bursts while you are driving, the engine can lose all of its coolant and overheat. The result can be expensive engine damage.

New cooling hose

Advantage:

Making sure that the coolant hoses on your vehicle are in good condition is an important factor in keeping your vehicle reliable and running properly. Replacing coolant hoses at recommended intervals can also save you money by avoiding possible engine damage and costly engine repairs.

Cabin filter replacement AI-18

Operation Description:

Access the cabin or pollen filter according to the vehicle manufacturer's service information. This usually involves opening the glove box and removing the bolt to lower the door. Remove the old cabin air filter from its housing. Replace with new cabin air filter. Replace the bolt to attach the glove box door. Close the glove box door. Clean the housing of all dust and debris. Install the new pollen filter into its housing.

A dirty and clogged cabin air filter

Significance:

The cabin or pollen filter is designed to filter out dust, pollen and other particles that would normally make their way into your vehicle through the heating, ventilation and air conditioning (HVAC) systems. Pollen filters work very well, but need to be replaced as part of a scheduled maintenance program. Restricted and dirty pollen filters put a strain on the blower motor, which can cause it to be excessively noisy and even fail prematurely. This kind of strain on a blower motor can also cause problems with the vehicle wiring and electrical system, due to the excessive amperage required for the blower motor to function. Replacing the blower motor can be very expensive on some vehicles.

A clean cabin air filter

Advantage:

A clean cabin or pollen filter can be very effective at keeping dust, pollen, and other unwanted particles from entering the interior of your car. Also, your blower motor will generate a higher volume of airflow, boosting the efficiency and effectiveness of your HVAC systems.

MacPherson strut replacement AI-22

Operation Description:

Note: MacPherson Struts should always be replaced in pairs. Lift the vehicle. Remove the wheels. Remove the strut and spring assembly from the vehicle. Using a strut spring compressor, carefully compress the coil spring and disassemble the strut assembly. Remove the strut cap and bearing, and inspect them for damage or wear. If the bearing or cap is damaged or worn, it must be replaced. Remove the strut insert from the strut assembly. Install the new strut insert. Reinstall the coil spring and cap and bearing. Carefully decompress the coil spring. Install the strut and spring assembly back onto the vehicle. Reinstall the wheel and torque the lug nuts to the correct torque specification. Perform a complete wheel alignment.

Worn out MacPherson struts

MacPherson struts

Significance:

When struts wear out, your vehicle will bounce too much when going over bumps. It will also sway excessively while moving through a turn. Worn out struts can lead to serious handling problems with your vehicle, and this presents a safety issue. Your vehicle may even handle in an unpredictable manner. Worn out struts can also cause your tires to wear unevenly, greatly reducing the life of your tires. You should replace your struts before they get to this point.

Advantage:

The MacPherson strut is widely used in modern vehicles. It combines a shock absorber and a coil spring into a single unit, which provides a more compact and lighter suspension system great for front-wheel drive vehicles. Good struts will help you stay safe, ride comfortably, and prevent your tires from wearing out quickly.

Tire replacement AI-23

Operation Description:

Raise the vehicle using an automotive lift. Remove the rim and tire assembly from the vehicle. Remove the tire from the rim. Install a new valve stem assembly. Install a new tire on the rim. Inflate the tire to recommended pressure. Balance the tire and rim assembly on a computer-aided dynamic tire balancing machine. Reinstall the tire and rim assembly onto the vehicle. Torque the wheel retaining nuts to the vehicle manufacturer's specifications.

Signs of irregular tire wear

Significance:

Your vehicle's tires are the only connection between your vehicle and the road. Safe vehicle operation depends on your tires being in good condition. If your tires are neglected, the tread can wear completely away, leaving the tire bald and often exposing the steel cords. Not only is this condition dangerous, it is also unlawful in many states. Tires with an abnormal tread wear pattern can cause the vehicle to shimmy and vibrate, and can adversely affect the manner in which your vehicle performs. A tire with an abnormal tread wear pattern will no longer contact the road the way that it was designed to, and this condition can be dangerous, especially during adverse road conditions.

New tire

Advantage:

Replacing worn tires is part of vehicle maintenance that is necessary to ensure that your driving experience is as safe as possible. Besides the obvious safety benefits, tires that are in good condition and properly inflated to the correct air pressure can increase the overall fuel economy and help provide a comfortable ride.

Shock absorber replacement AI-24

Operation Description:

Note: Shock absorbers should always be replaced in pairs. Carefully lift the vehicle using an approved automotive lift. Remove the wheel that corresponds with the shock that is going to be replaced. Follow the vehicle manufacturer's service information and remove the shock absorber from the vehicle. Inspect the shock mounting points on the vehicle for wear or damage and make repairs as necessary. Install the new shock absorber. Reinstall the wheel and torque the lug nuts to the correct torque specification.

Uneven tire wear due to worn shock absorbers

Significance:

When a shock absorber wears out, your vehicle will bounce too much when going over bumps. It will also sway excessively when you go into a turn. Worn out shocks can lead to serious handling problems with your vehicle, and this presents a safety issue. Additionally, your vehicle may handle in an unpredictable manner. Worn out shocks will also cause your tires to wear unevenly, greatly reducing the life of your tires. You should replace your shock absorbers before they get to this point.

New shock absorber

Advantage:

Replacing your worn out shock absorbers can greatly improve how your vehicle handles, making your vehicle more predictable and safer to drive. It will also prevent the premature tire wear that is associated with worn out shock absorbers.

Air filter replacement AI-28

Operation Description:

Remove the air filter element from the air filter housing. Clean the air filter housing and inspect the fresh air duct hose for damage, dirt, or obstructions. Inspect the warm air intake hose for signs of deterioration. Install a new filter element, and then reinstall the air filter housing access panel.

Dirty and restricted air filter

Significance:

A dirty or clogged air filter can affect the fuel economy and overall vehicle performance. Both diesel and gasoline powered engines are designed to maintain a specific air-fuel ratio. A restricted air filter can affect the way the engine maintains the correct air-fuel mixture. If the air filter is restricted, the fuel mileage and overall vehicle drivability can deteriorate rapidly.

New air filter

Advantage:

Replacing your air filter element is a quick and effective way to keep your engine running at its peak performance. A clean air filter helps your engine work more efficiently by letting the airflow get to the engine with no restrictions. A clean air filter can also prolong the life of your engine.

Fuel filter replacement AI-29

Operation Description:

Depressurize the fuel system. Remove the fuel filter retaining straps and disconnect the fuel feed and supply lines. Install a factory-approved replacement filter, and then reinstall the retaining components. Check for signs of damage to the fuel lines or connections.

Old fuel filter

Significance:

Fuel filters play a crucial role in your engine's performance. If the filter becomes restricted, the engine will starve for fuel and not perform properly. Damaged fuel filters can allow debris to flow through the lines and clog the pressure regulator and fuel injectors. Fuel filters have a life expectancy of about five years. It is important to replace it at the recommended service interval.

New fuel filter

Advantage:

Factory replacement parts are designed to work in a specific system by the vehicle manufacturer. Proper filtration of fuel that enters the carburetor or fuel injection system is mandatory to keep your engine performing like new.

Wheel alignment AI-35

Operation Description:

Inspect the front and rear suspension components for any signs of wear or damage. Using specialized wheel alignment equipment, adjust the suspension and wheels to the vehicle manufacture's specifications.

Abnormal tire wear from bad alignment

Significance:

Vehicle suspensions can wear with age and repeated heavy use. Rough road surfaces and an occasional pothole can change the vehicle's wheel alignment. A wheel alignment can improve your steering control and overall vehicle handling. It can also help prevent abnormal tire wear by bringing the vehicle suspension components back to the vehicle manufacturer's specifications. This important step will keep your vehicle driving the way it was designed to. An alignment is necessary any time a worn suspension part is replaced.

Wheel alignment

Advantage:

Even slightly worn suspension components can affect the vehicle's wheel alignment. This can lead to premature wear of tires and reduce overall vehicle comfort and safety. A vehicle with worn-out suspension parts can be unsafe to drive. Maintaining your vehicle suspension and performing regular wheel alignments and tire rotations can keep your vehicle safe and reliable.

Bulb replacement AI-41

Operation Description:

Perform a function test of entire lighting system. Visually inspect the headlamps, high and low beams, hazard signals, turn indicators, parking lights and brake lights. Remove and install new light bulbs as needed to repair inoperative vehicle lamps.

Burned-out light bulbs

Significance:

Lighting systems are required on all vehicles by both state and federal laws. Lights are a major contributor to your safety, not only by allowing you to see the road in front of you at night, but also by allowing other vehicles to see you. The value of having fully-functioning lights far outweighs the cost of replacing burned-out light bulbs. The cost is normally less than the inconvenience and can also prevent you from receiving a traffic citation.

New light bulb

Advantage:

The vehicle lighting system is an important safety feature of your car. Replacing burned out light bulbs is an inexpensive way to ensure that your driving experience is a safe one.

Coolant fluid exchange service AI-59

Operation Description:

Some coolant may be in such poor condition that a coolant flush is necessary to remove the corrosion and deposits that were created in the engine and the radiator. If so, an approved coolant removal and cycling machine is required for this procedure. Our trained technician will connect the vehicle to a state-of-the-art machine and add a cleaner to safely remove rust, sludge and scale deposits. Once the system has been cleaned, the technician will install a new coolant-and-water mix, along with a conditioner to protect the cooling system. Once this is finished, the engine will be allowed to run until it reaches normal operating temperature and then the fluid will be checked and adjusted if necessary.

Clean vs. dirty, acidic coolant (antifreeze)

Coolant flush equipment

Significance:

The engine’s coolant pulls the heat from the engine and then dissipates the heat when it enters the radiator. The engine's cooling system is a complex system comprised of many components and materials. The most common materials used are aluminum, plastic, copper, brass, rubber, and steel. The engine coolant must be compatible with all of them. The engine coolant is designed to transfer heat, stop corrosion, and provide a lubricant for the water pump seal. Old antifreeze can become acidic. The combination of acidic fluid and the dissimilar alloys in the cooling system actually creates a crude battery. This condition can cause accelerated corrosion of these materials. Changing the coolant according to a preventative maintenance schedule will prevent this acidic condition, and help prevent corrosion, and expensive future repairs.

Advantage:

Replacing the engine coolant as a part of a scheduled maintenance program is essential to your vehicle's reliability and longevity. New engine coolant has a non-acidic, non-corrosive PH level that will not destroy your cooling system components. The use of proper engine coolant will help keep your engine from overheating, and can help prevent the engine from freezing during cold weather conditions.

ATF fluid exchange without filter — AI-60

Operation Description:

Using a state-of-the-art machine, one of our specially trained technicians will use a safe and effective cleaner to dissolve and suspend the varnish and gums in the transmission, valve body, torque converter, pan, filter element, transmission lines, and transmission cooler. The technician will then flush the entire unit of all old fluid and suspended debris and install new transmission fluid of the proper specification and fortify the new fluid with seal conditioners, oxidation inhibitors and friction modifiers. Finally, he will run the vehicle to operating temperature and ensure that the automatic transmission fluid is filled to the correct level.

Valve body spool with heavy build up

Significance:

When was the last time you had your vehicle's transmission serviced? Have you experienced slipping, hard shifting, or chattering? All of this can indicate that an automatic transmission flush service is needed.

Valve body spool after transmission service

Advantage:

By having your automatic transmission cleaned and its fluid replaced every 2 years or 30,000 miles, you can keep the transmission running efficiently, restore transmission fluid circulation, help prevent overheating, smooth shifting and transmission operation, and reduce transmission wear. All of this helps you avoid costly future repairs to the transmission.

Power steering fluid exchange service AI-62

Operation Description:

One of our skilled technicians with specialized equipment will use a powerful cleaner to dissolve and suspend the varnish and gums in your vehicle's power steering unit and then flush the entire unit of all old fluid and contaminants and install new high-tech fluid for both conventional sector and rack and pinion. Finally, the technician will road test your vehicle.

Power steering spool valve with hardened cracked seals

Significance:

If you have experienced steering pump noises, hard or erratic steering, or pump leaks, it's probably time to have your vehicle's power steering system serviced. The power steering pump produces high pressures (between 800–2,000 lbs./400 – 1,000 kg, depending on model) and high heat. Heat + pressure = fluid breakdown/failure; fluid failure = power steering pump and/or rack failure; power steering pump and/or rack failure = costly repair.

Grooves worn into the housing by hardened seals

Advantage:

Our power steering service will alleviate steering squeal caused by sticking valves, correct that jerky feeling on the steering wheel, help prevent fluid leaks, and reduce wear.

Brake fluid exchange service AI-63

Operation Description:

One of our skilled technicians will check the condition of your vehicle's brake fluid and, if necessary, remove contaminated fluid from the brake lines and master cylinder, replace the old fluid with appropriate brake fluid. The entire brake system will be inspected for leaks, master cylinder corrosion, worn pneumatic parts, harmful varnish build-up, broken or rusted bleeder valves, worn rotors and drums, and air in the brake lines.

Harmful deposits on brake master cylinder piston assembly

Significance:

Does your vehicle's brake pedal feel "spongy"? Brake fluid becomes contaminated over time and use. Heat and moisture can cause brake failure. Contaminated fluid leads to expensive repairs.

Brake fluid before and after service

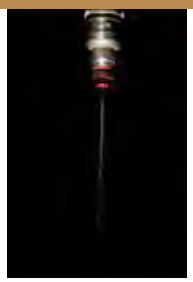
Advantage:

Worn-out, oxidized brake fluid causes corrosion and harmful deposits and varnish build up. A brake flush service should be performed when your brake fluid shows contamination or every 30,000 to 40,000 miles.

Fuel injector cleaning AI-71

Operation Description:

Injectors can be cleaned in several different ways depending on the severity of the problem, your type of vehicle, and the particular equipment your service facility uses. The quickest and easiest is a solvent put in the gasoline, but anything that can go in the gas tank will be diluted and thus not have the strength to actually clean an injector, although it may help the injector from clogging with regular use. The most common cleaning method is a high-pressure, "on the car" cleaning process where special equipment is hooked up to the fuel intake and a powerful solvent is injected under high pressure through the fuel injectors to clean out the stubborn deposits. The most aggressive method is to remove the injectors and have them cleaned "off the car" which usually is not cost effective except in very specific situations.



Poor spray pattern

Good atomization

Significance:

The efficiency of your vehicle is very dependent on the proper atomization or spray pattern that the fuel injector is responsible for. As little as an 8 or 10% restriction in an injector can adversely affect your engine's performance by not allowing the gasoline entering the combustion chamber to be burnt effectively, losing part of the energy that was available, but not burned.

Advantage:

Fuel injectors are the single most important component in the fuel system to keep your engine running efficiently and getting the most performance and mileage from every ounce of gasoline.

Bulb replacement - license AI-79

Operation Description:

The technician will remove the license plate assembly and determine if it can simply be cleaned or if it must be replaced. The technician disconnects and inspects the wiring and connectors to ensure that the corrosion has not contaminated these. Once the electrical components of the new assembly have been reconnected, the technician will install a new bulb and reassemble the part into the deck lid assembly.

License plate bulb disassembled

Significance:

Most laws require that vehicles maintain lights on the license plate at all times after dark. This not only helps with the visibility of your car, but it also saves you from getting an unnecessary ticket.

Working license plate bulbs

Advantage:

The old and corroded bulb assembly will, if left unattended, create unneccesary resistence in that wiring circuit. This is dangeous as it will continue to burn out bulbs and could cause other damage such as melted wires, corrosion in the wiring harness, and shorts in the elctrical components. It is wise to maintain this system of your vehicle.

Recommended Services

Our technicians recommend the following services for your vehicle.

Original Customer Requests	Status	Cost	Declined	Approved
A. C/S: CUST. STATES THE AIR BAG LIGHT IS ON AND NO CODES IN MEMORY? CHECK/ADVISE				X
DIAG (VERIFY AIRBAG LIGHT STAYS ON. PERFORM SCAN TOOL TEST. NO CODES. INSPECT AIRGAG LIGHT CIRCUIT FOR SHORTS. R&R CENTER CONSOLE AND RADIO TO INSPECR AND VERIFY POSSIBLE WIRING DAMAGE. NONE FOUND. INSPECT AIRBAG MODULE CONNECTOR AND FOUND SHORTING BAR TO)	Fail	$407.87		X
REPLACE DRIVER SEATBELT ASSY (VERIFY AIRBAG LIGHT STAYS ON. PERFORM SCAN TOOL TEST. NO CODES. INSPECT AIRGAG LIGHT CIRCUIT FOR SHORTS. R&R CENTER CONSOLE AND RADIO TO INSPECR AND VERIFY POSSIBLE WIRING DAMAGE. NONE FOUND. INSPECT AIRBAG MODULE CONNECTOR AND FOUND SHORTING BAR TO)	Fail	$550.89		X
B. PERFORM COMPLETE "WALK AROUND" MULTI POINT MPI INSPECTION.(COMPLIMENTARY)				X
C. FREE EXTERIOR CAR WASH				X

Previously Declined Recommendations	Status	Cost	Declined	Approved
Replace canister filter		$102.90		
PERFORM DECARB AND THROTTLE BODY SERVICE	Fail	$143.87		
REPLACE LEFT FRONT SEAT BELT BUCKLE ASSY.	Fail	$334.97		
REPLACE RIGHT REAR HUB ASSY	Fail	$431.74		
REPLACE SPARK PLUGS AND INTAKE GASKET	Fail	$427.43		
SCAN TOOL AND DIAG TEST	Fail	$95.00		
Change engine oil and filter	Fail	$29.95		*See AI-3*
Perform coolant fluid exchange service	Fail	$130.25		*See AI-59*
Perform brake system fluid exchange	Fail	$120.10		*See AI-63*
Perform four wheel alignment	Fail	$79.95		*See AI-35*
Replace front struts	Fail	$240.00		*See AI-22*
Replace rear shock absorbers	Fail	$240.00		*See AI-24*
Replace air filter element	Fail	$24.95		*See AI-28*
Mount and balance 4 new tires	Fail	$534.00		*See AI-23*

Previously Declined Recommendations	Status	Cost	Declined	Approved
Diagnose check engine light	Fail	$95.00		*See AI-8*
Replace serpetine belt	Fail	$174.16		*See AI-11*
Replace upper radiator hose	Fail	$108.42		*See AI-16*
Replace lower radiator hose	Fail	$159.99		*See AI-16*
Perform automatic transmission fluid exchange service	Fail	$178.01		*See AI-60*
Replace front struts	Fail	$508.87		*See AI-22*
Replace rear shock absorbers	Fail	$341.87		*See AI-24*
Replace air filter element	Fail	$20.95		*See AI-28*
Replace cabin air/HEPA filter	Fail	$39.95		*See AI-18*
Replace Evap Canister	Fail	$86.00		
Replace Fuel Filter	Fail	$99.95		*See AI-29*
Perform Fuel Injection Service	Fail	$98.95		*See AI-71*
PERFORM NITROGEN SERVICE	Caution	$39.95		
Perform power steering system fluid exchange service	Caution	$74.87		*See AI-62*
Replace center (third) brake light bulb	Caution	$100.00		*See AI-41*
Replace license plate bulb	Caution	$48.87		*See AI-79*

Totals, Taxes and Fees	Cost	Declined	Approved
Estimate Subtotal	$6,069.68	$0.00	$958.76
Shop Fees Hyundai	$65.00		
Tax	$449.16		
Estimate Total	**$6,583.84**		

For "See AI-" items *see the "Additional Info*