

FUNDAMENTAL PROCEDURES

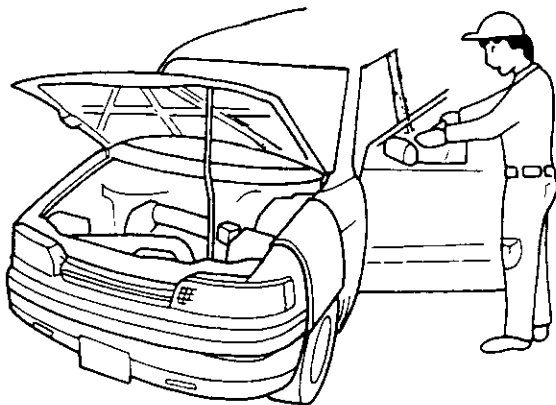
* NOTICES, CAUTIONS AND WARNINGS

As you read through the procedures, you will come across NOTICE's, CAUTION's, and WARNING's. Each one of these indicates a specific purpose. NOTICEs give information to prevent you from making an error that could damage the vehicle or components. CAUTION's remind you to be especially careful in those areas where carelessness can cause personal injury. WARNING's remind you to be extremely careful in those areas where carelessness can cause potential death. The following list contains some general WARNING's you should follow when working on the vehicle.

PROTECTION OF THE VEHICLE

* Notice

Use appropriate covers to protect fenders, carpeting, and upholstery of the vehicle prior to servicing or repair.

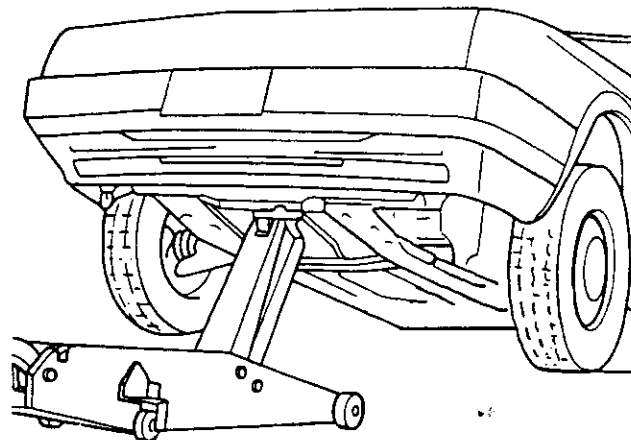


KIA-163-00-01-S

A WORD ABOUT SAFETY

The following precautions must be followed when jacking the vehicle:

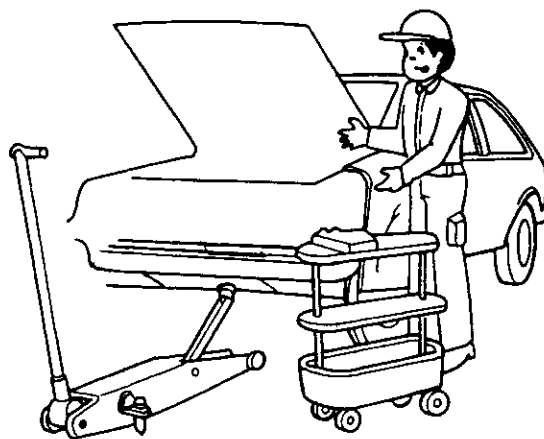
1. Block the wheels.
2. Use only the specified jacking positions.
3. Support the vehicle with safety stands.



KIA-163-00-02-S

PREPARATION OF TOOLS AND MEASURING EQUIPMENT

Be sure all necessary tools and measuring equipment are available before starting any work.



KIA-163-00-03-S

SPECIAL TOOLS

Use special tools when they are required.

VEHICLE TOWING - EMERGENCIES

TOW TRUCK TOWING

All state or provincial (in Canada) laws and local laws regarding towing should be obeyed.

⚠ WARNING
SAFETY CHAINS SHOULD BE USED FOR ALL TOWING OPERATIONS.

*** Notice**
Proper towing equipment should be used to avoid possible damage to the vehicle during towing operation.

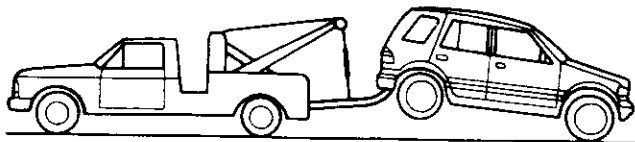
Prior to towing, make sure that steering system, transmission, and rear axle are in good condition. If any unit is damaged, use a towing dolly.

Towing With Rear Wheels Off the Ground

When being towed by a commercial tow truck, the rear of the Sportage should always be lifted, not the front.

*** Notice**
Both the transmission shift lever and the transfer case shift lever must be in "NEUTRAL." Failure to do so may cause internal damage to the transmission.

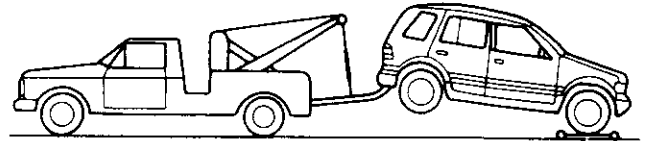
1. Set the ignition switch to the "ACC" position.
2. Place the shift lever in "NEUTRAL."
3. Shift the transfer case lever to N (neutral).
4. Release the parking brake.



KIA-163-00-22-S

Towing With Towing Dollies

If the steering system, transmission, or rear axle is damaged, use a towing dolly.

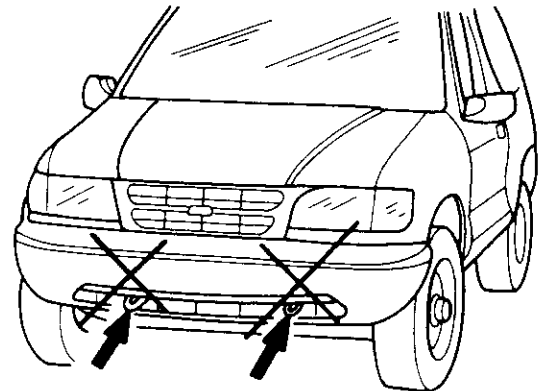


Wheel Dollies

KIA-163-00-24-S

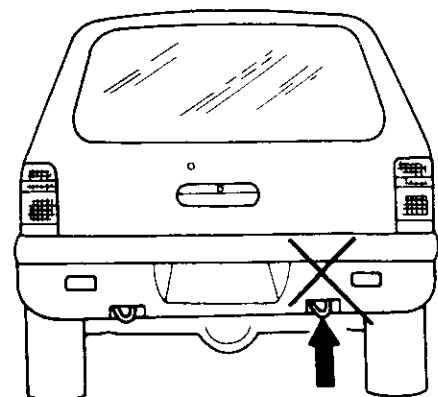
- * Notice**
- *Remove the rear drive shaft if it is necessary to exceed 28 mph and/or 50 miles. If the drive shaft cannot be removed, stop every 50 miles and start the engine. Allow the engine to idle for a few minutes to ensure the Transmission is sufficiently lubricated.*
 - *Do not tow the vehicle from hook loops. Hook loops are designed only for transport tiedown. If hook loops are used for towing, vehicle body will be damaged.*

Tie Down Hook-Front



KIA-163-00-26-S

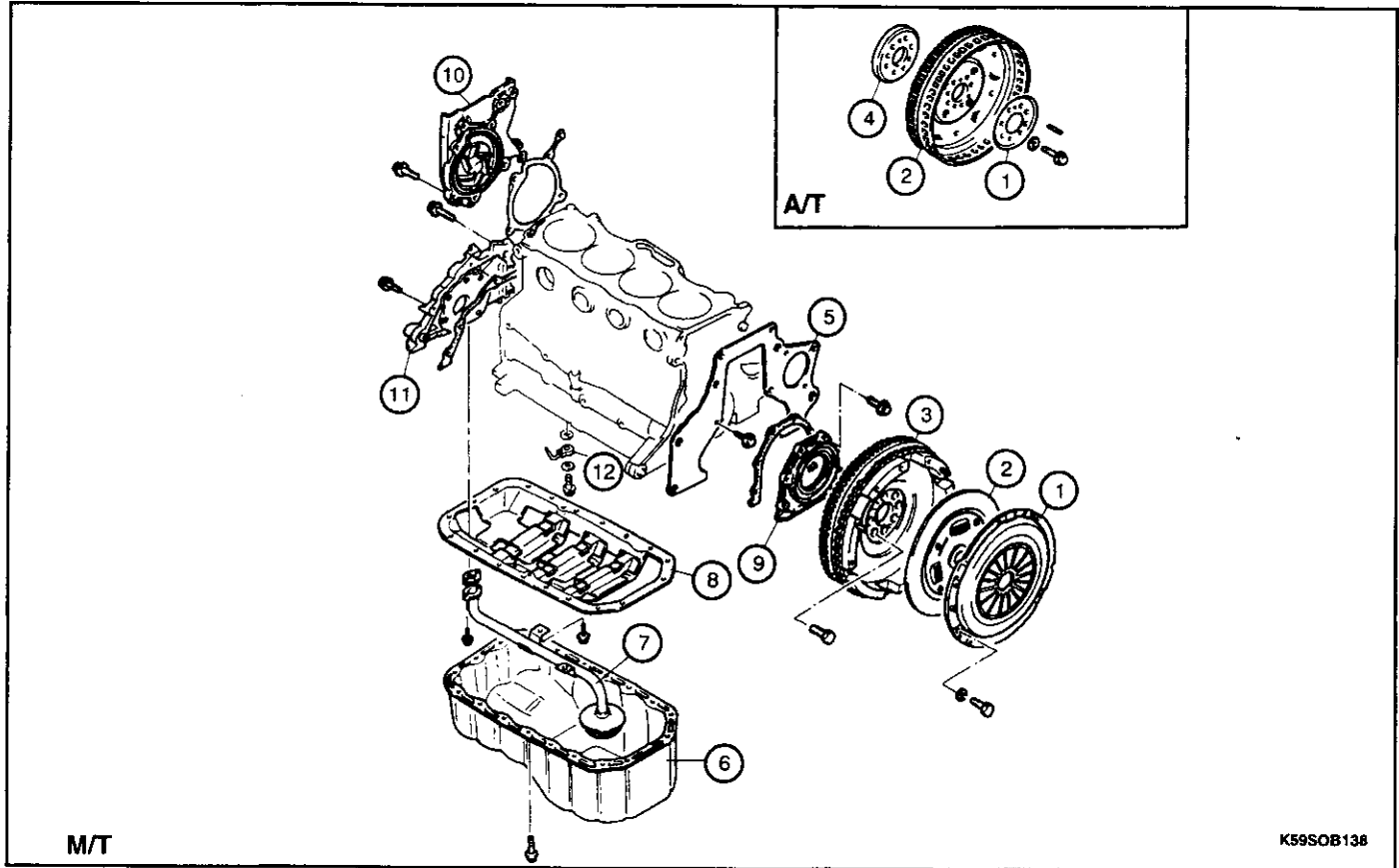
Tie Down Hook-Rear



KIA-163-00-27-S

CYLINDER BLOCK (EXTERNAL PARTS) DISASSEMBLY

1. Remove external engine parts in the sequence shown below.



K59SOB138

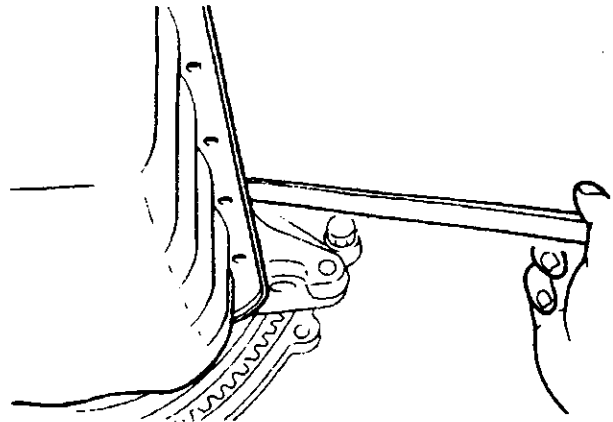
- | | |
|--|-------------------------|
| 1. Clutch Cover (M/T), Backing Plate (A/T) | 7. Oil Strainer |
| 2. Clutch Disk (M/T), Drive Plate (A/T) | 8. Stiffener Plate |
| 3. Flywheel (M/T) | 9. Rear Cover |
| 4. Drive Plate Adapter (A/T) | 10. Water Pump Assembly |
| 5. Separator Plate | 11. Oil Pump Assembly |
| 6. Oil Pan | 12. Piston Cooling Jet |

Oil Pan

1. Remove the oil pan mounting bolts.
2. Insert a scraper or a tool between the oil pan and the stiffener or cylinder block to separate them.
3. Remove the oil pan.

Caution

Do not damage or scratch the contact surface when removing the oil sealant.

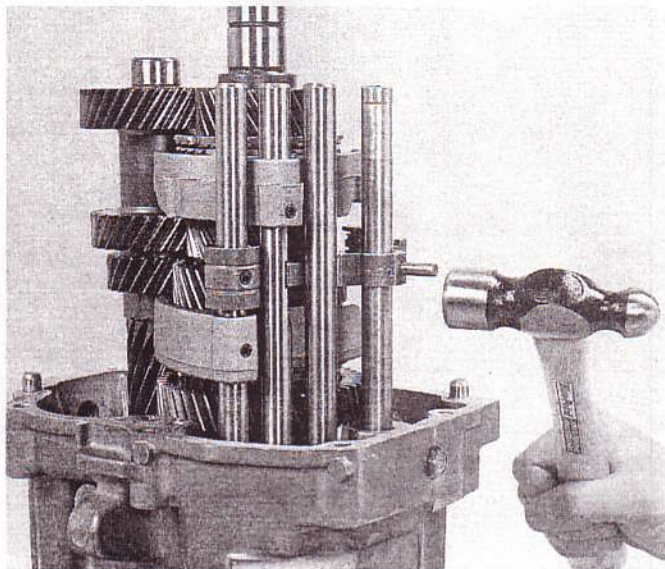


K59SOB141

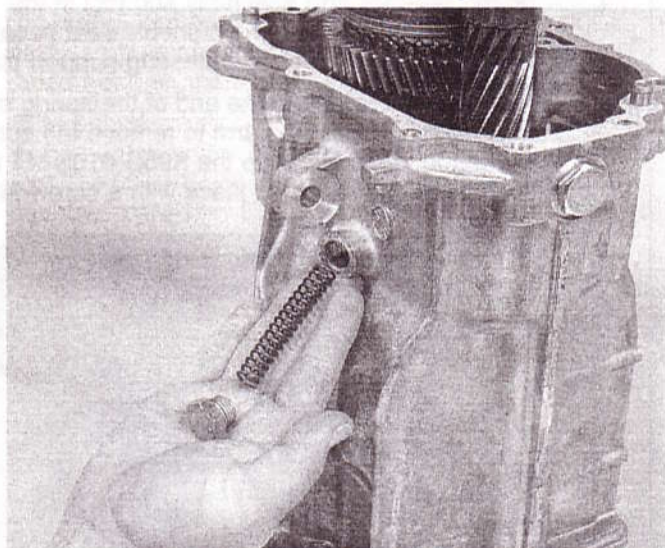
21-42 EMISSION CONTROL SYSTEM

P0335	Crankshaft position sensor circuit malfunction
Threshold Value - No signal Enable Conditions - NA Time Requirements - Continuous (4 camshaft revolutions) MIL Illumination - Immediately	Related Items <ul style="list-style-type: none"> • Open between Crankshaft Position Sensor (CKP) and ECM. • Short to battery between CKP and ECM. • Short between CKP Sensor wires. • Faulty CKP Sensor.

STEP	INSPECTION	Y/N	ACTION
1	IMPORTANT! Record all freeze frame data before disconnecting any connectors or clearing code(s). With ignition key off, disconnect C147 from CKP and C211 from ECM. Connect adapter cable #K99U-2106-G17 to BOB and vehicle C211 to adapter cable. Measure resistance from C147-1 to BOB pin 16 and from C147-2 to BOB pin 43 (< 1 ohm). Is resistance less than 1 ohm?	YES	Go to step2.
		NO	Locate source of high resistance/open. Repair as necessary.
2	Measure resistance between BOB pin 16 and BOB pin 43 (infinite resistance). Is measured resistance infinite?	YES	Go to step 3.
		NO	Locate source of short between CKP Sensor wires. Repair as necessary.
3	Turn ignition on (engine off) and measure voltage at BOB pin 16 and BOB pin 43 (0v). Is measured voltage 0v?	YES	Go to step 4.
		NO	Locate source of short to B+ and repair as necessary.
4	Turn ignition off and reconnect C147 to CKP. Measure resistance between BOB pin 16 and BOB pin 43 (800 to 900 ohms at 68°F). Remove CKP Sensor from transmission and calculate air gap between sensor and flywheel/torque converter (0.037" to 0.067" - 0.95mm to 1.7mm) [measure distance from housing to teeth on flywheel/torque converter (measurement "A") and from mounting surface on sensor to sensor tip (measurement "B") - subtract "B" from "A" = air gap]. Are air gap and resistance measurements within specification?	YES	Thoroughly check for loose, bent or corroded terminals at CKP Sensor and ECM. Repair as necessary and proceed to step 5.
		NO	Replace CKP Sensor or call tech line if air gap is out of specification.
5	Connect adapter cable C211 to ECM and reconnect C147 to CKP. Set up KIA Data Pro for use as a single channel oscilloscope (refer to <i>KIA Data Pro Program Card Operators Manual</i> section 4 for set up procedures). Make sure internal NI-CAD battery is fully charged or use adapter cable to power scan tool. Do not connect scan tool to OBD-II DLC for power source as this will affect waveform. Adjust F1 to 2 ms, F2 to 5v, F3 to 0.00v, F5 to j, and F6 to n or a. Attach scan tool positive probe to BOB pin 16 and negative probe to BOB pin 43. Start vehicle, warm up to operating temperature and allow to idle. Compare waveform with sample in diagram "A" (your vehicle's amplitude may vary from sample, but there should be a break [indicating gap for cylinder #1 identification] followed by steady pulses of similar duration and amplitude). If waveform is okay, try wiggle testing harness between CKP and C211 while monitoring scan tool screen (repair harness in affected area if any anomalies arise). If waveform is erratic, substitute known good CKP and retest.		
6	Clear codes and return vehicle to original condition. Verify any repairs by driving vehicle with KIA Data Pro connected to OBD-II connector and monitoring for pending codes (refer to section 3 of the KIA Data Pro Generic OBD-II Program Card reference manual).		



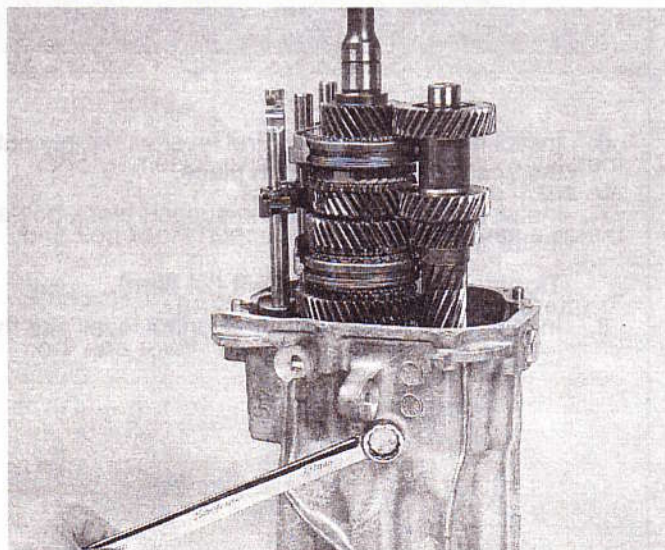
9. Install the 5th/reverse return spring.



10. Apply thread sealer to the threads of the plug and install the plug in the rear cover.

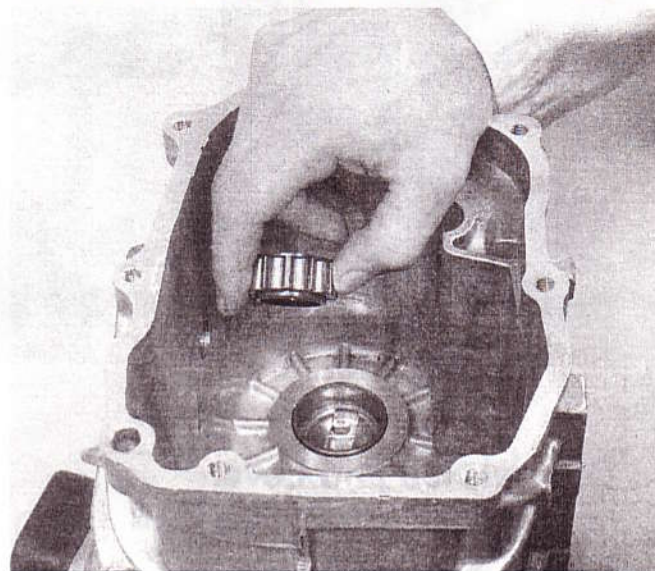
Tightening torque: 44 lb-ft (60 N·m).

11. Install a new washer on the backup light switch and install the switch into the rear cover.



Reverse Idler Gear

1. Install the reverse idler gear into the rear cover so that the chamfered side faces down and the grooved side faces up.
2. Install the reverse idler gear shaft into the gear.

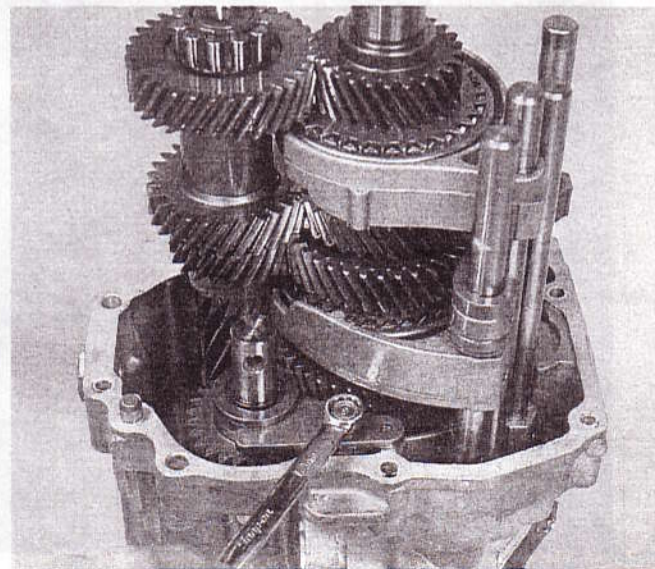


3. Install a new washer onto the rear mounting bolt. Apply thread sealer to the threads and install the bolt.

Tightening torque: 18 lb-ft (24 N·m).

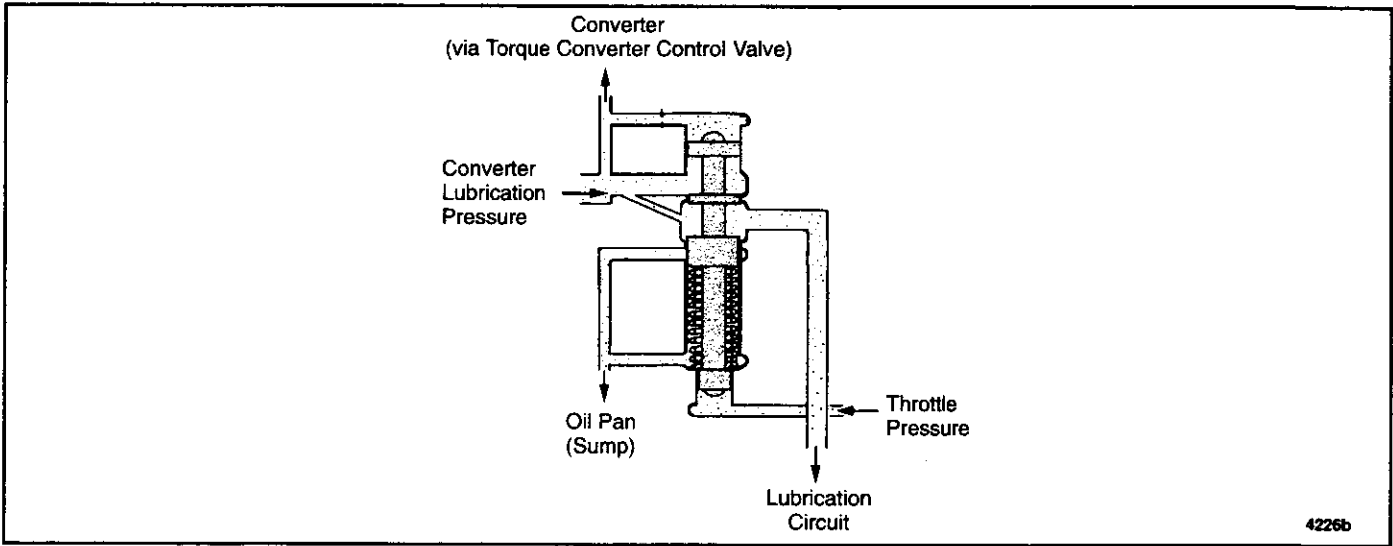
4. Install a new helical spring washer onto the locking plate bolt and install the locking plate using the bolt.

Tightening torque: 18 lb-ft (24 N·m).

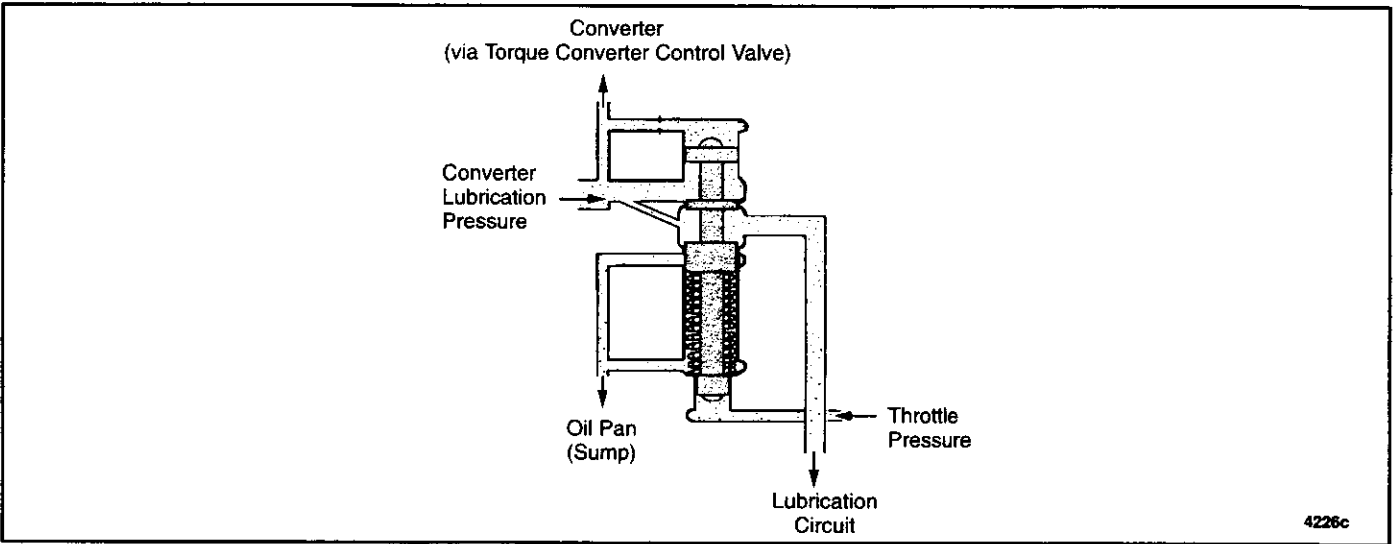


Front Housing

1. Grease the countershaft roller bearing and install it into the front housing race with the stepped collar side facing the race.



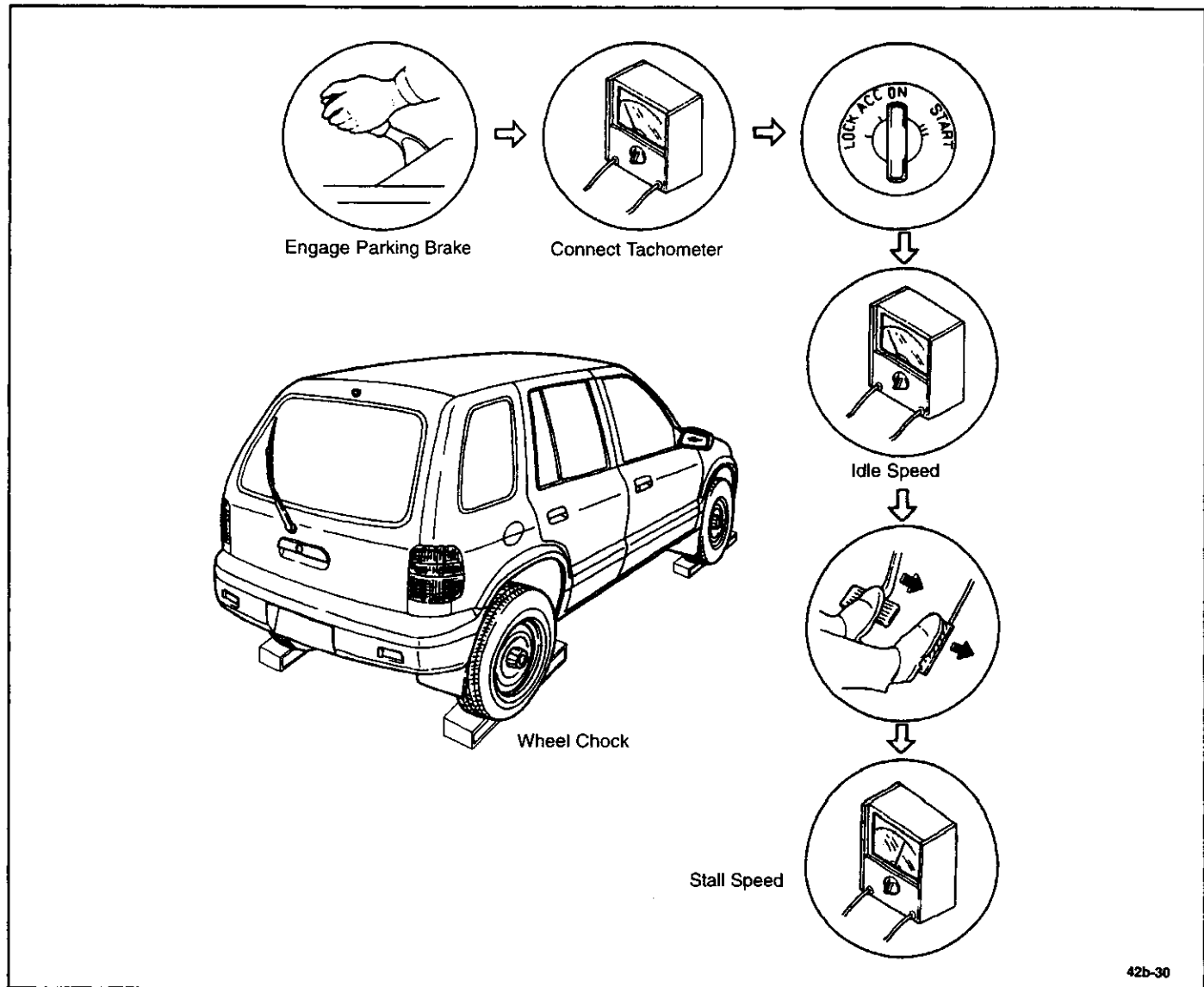
As converter back pressure drops, spring tension overcomes the "downward" force of the pressure and the valve moves "up", sealing off the passage to the oil pan. This cycle either repeats itself or maintains a balance between secondary regulator valve spring tension and converter and lubrication back pressure.



Converter/lubrication pressure is also affected by throttle position. When the throttle is closed, converter and lubrication pressure is approximately 52 psi. As the throttle is opened, throttle pressure is added to the spring tension to raise converter pressure and, more importantly, lubrication pressure to the bearings and bushings in the transmission.

The secondary regulator valve, at rest, traps the fluid in the torque converter circuit. This prevents fluid in the torque converter from draining back to the oil pan when the engine is OFF.

Procedure



42b-30

1. Connect a tachometer to the engine.
2. Start the engine.
3. Check engine idle speed in P range. (Refer to Section 21.)

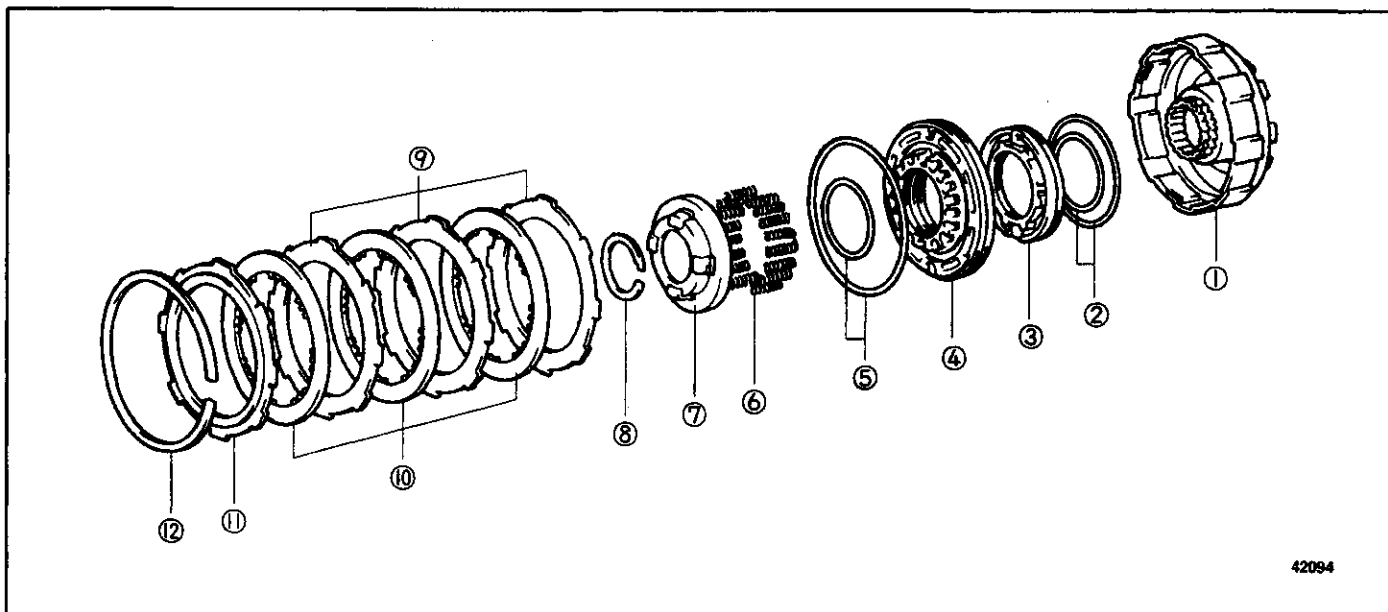
***** *Notice*
 Idle speed should be between 750 and 850 rpm (with parking brake applied).

4. Shift the selector lever to R range.

⚡ *Caution*
 Perform steps 5 and 6 within 5 seconds to prevent possible transmission damage.

5. Firmly depress the foot brake with the left foot, and gently depress the accelerator pedal to the floor with the right foot.
6. When the engine speed no longer increases, quickly read the engine speed and release the accelerator.

DIRECT CLUTCH

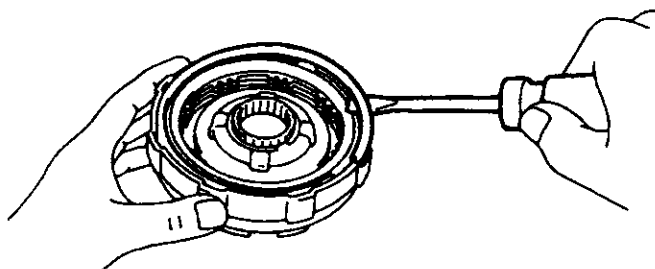


42094

- | | |
|---------------------------------|-----------------------|
| 1. Direct clutch cylinder | 7. Return spring seat |
| 2. O-ring | 8. Retaining ring |
| 3. Direct clutch piston (inner) | 9. Clutch plates |
| 4. Direct clutch piston (outer) | 10. Clutch discs |
| 5. O-rings | 11. Retainer plate |
| 6. Return spring | 12. Retaining ring |

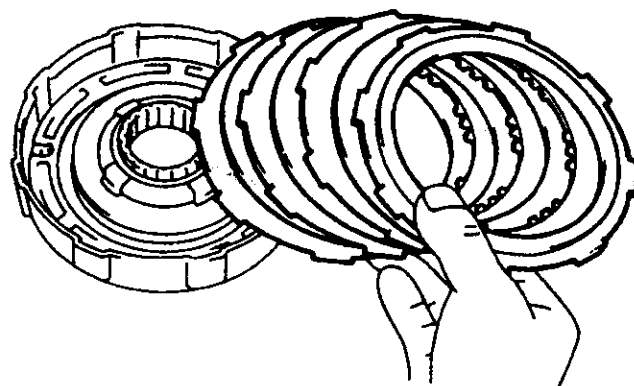
Disassembly

1. Remove the direct clutch assembly from the center support and then remove the retaining ring.



42106

2. Remove the retainer plate and then remove the clutch discs and clutch plates.



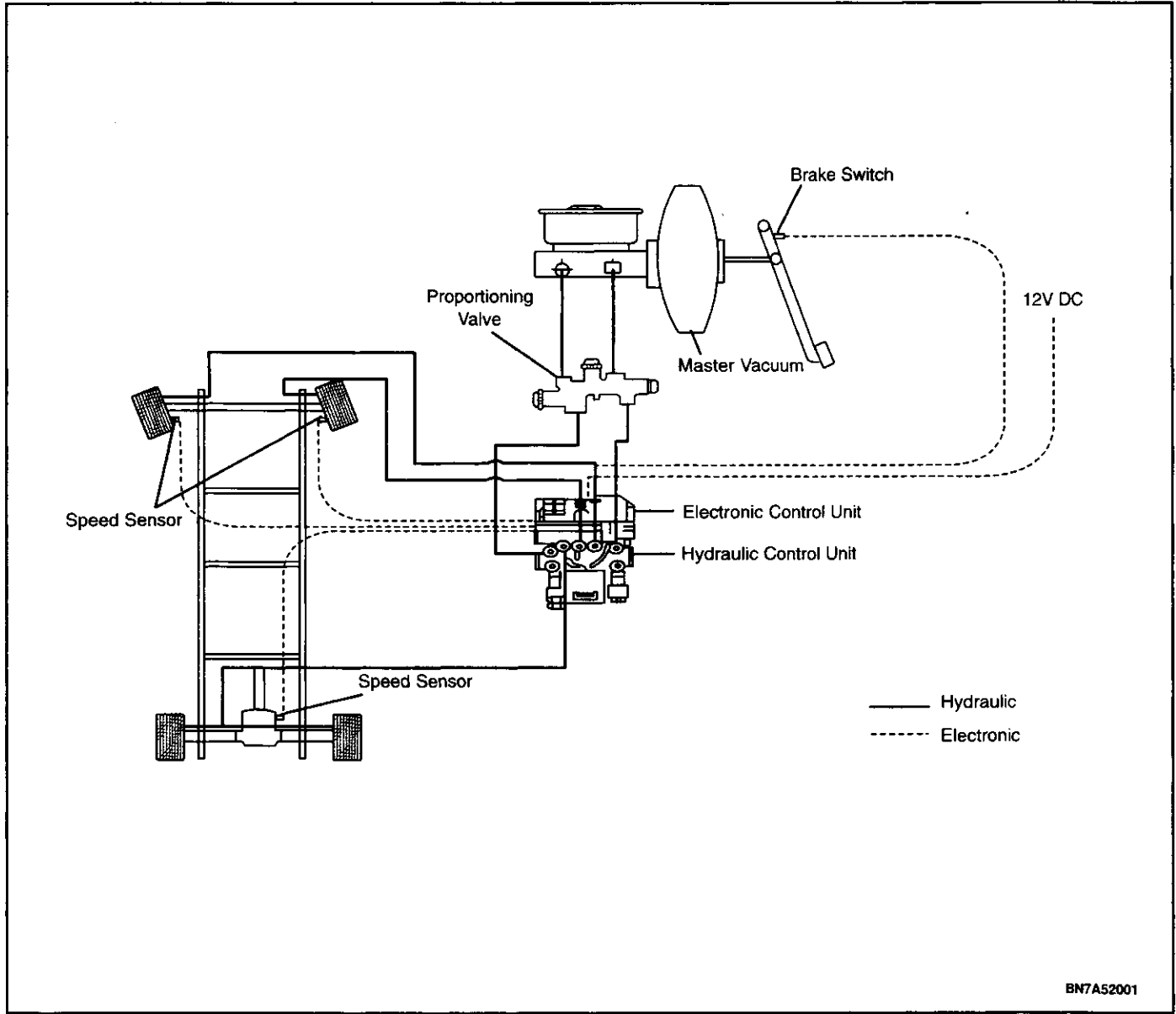
42107

3. Using SST K95B-4200 AT3 and an hydraulic press, compress the eighteen direct clutch piston return springs and remove the retaining ring, return spring seat, and the return springs.

* **Notice**
Be careful when applying pressure, excessive pressure will cause the plate section of the piston return spring to deform.

ANTILOCK BRAKE SYSTEM

The Sportage is equipped with an antilock brake system. Under unstable braking conditions the ABS control unit senses the drop in speed and modulates hydraulic pressure to the brakes, preventing lockup of the wheels (continued on page 52-7).



ON-VEHICLE SERVICE

SERVICE WARNINGS

Personal Safety

Failure to follow all warnings, cautions, notices and procedures could result in personal injury or death.

Power Supply Deactivation

The Air Bag Diagnostic Unit contains a backup power supply. Before disconnecting air bag-SRS components, turn the ignition switch to **LOCK**, disconnect the battery (negative terminal first), and wait 10 minutes for the backup power supply to discharge. To ensure complete discharge, turn the headlights on.

Failure to follow this procedure could cause the air bag modules to deploy during service procedures, which may cause serious injury.

Safety Equipment

- **Always wear safety glasses when handling air bag modules.**
- **Always wear rubber gloves when handling deployed or damaged air bag modules.**

The air bag surface may be contaminated with small amounts of sodium hydroxide (NaOH). Prevent contact of air bag module with liquids, combustibles, and flammable materials. Immediately wash contaminated hands and skin areas with mild soap and water. Flush eyes with water if exposed to byproducts. Failure to follow these instructions could result in chemical burns and personal injury.

Wiring and Electrical Components

Never service wiring or electrical components when any air bag is connected. When a procedure directs the use of a multimeter to probe the pins of a connector, insert the probes into the back of the connector where possible. If you must probe the front face (terminal side), be certain to use a probe whose tip will not damage the terminals when it is inserted.

Component Disassembly

Do not disassemble any air bag-SRS components. Disassembly can render the system inoperative, which may result in serious injury or death in the event of an accident. Never attempt to disassemble or repair the air bag modules.

Any attempt to adapt, re-use, or install an air bag module or its components in another vehicle may result in serious injury or death to the vehicle occupants in the event of an accident.

Air Bag Diagnostic Unit (ADU)

Do not connect the ADU connector unless the ADU is securely installed. The shock of installation or pinching the wiring harness between the module and its mounting points can cause the air bags to deploy, which may cause serious injury.

Air Bag Module Inspection

Do not probe or inspect the air bag modules or any of their connectors with an ohmmeter. Inspecting the air bag module with an ohmmeter, which supplies current, can cause the air bags to deploy, which may result in serious injury.

Air Bag Module Connector

Do not cut or otherwise remove the air bag module connector. The connector contains a safety shunt which, if disabled, could cause an unintended deployment. This may cause severe personal injury or death.

Air Bag Module Handling

A live (undeployed) air bag module may accidentally deploy during handling. When carrying a live air bag module, point the plastic trim cover away from your body to lessen the chance of injury in case of accidental deployment. Never carry the module by its wiring or connectors.

Securing Air Bag Modules

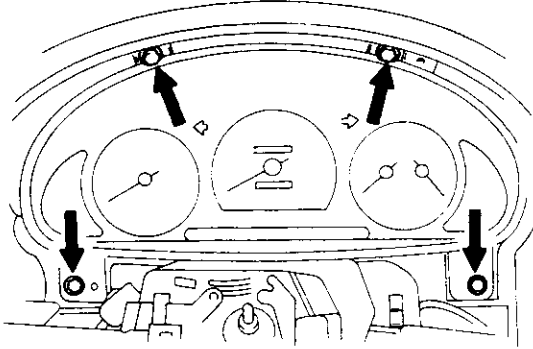
Always place live air bag modules face up (plastic trim side up) to lessen motion of the module in case of accidental deployment. Keep the area clear of parts, tools and other debris. Never place items on or above the trim cover of a live air bag module. In case of accidental deployment, such items may cause serious injury or death.

INSTRUMENT CLUSTER ASSEMBLY

Instrument Cluster

Removal

1. Disconnect battery.
2. Remove the instrument cluster trim.
3. Remove four mounting screws.
4. Pull the cluster from the instrument panel.
5. Disconnect the fuel gauge, speedometer and tachometer connectors.
6. Remove the instrument cluster.



KIA163-60-1702-S

Inspection

- Inspect the cluster for signs of any damage and replace the damaged part as necessary.

Installation

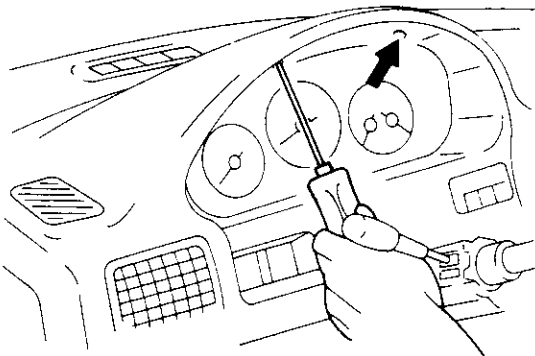
1. Place the cluster in the instrument panel.
2. Connect fuel gauge, speedometer/odometer/trip meter, and tachometer gauge connectors.
3. Push the cluster into the instrument panel.
4. Install four cluster mounting screws.
5. Install the instrument cluster trim.

Trim

Removal

CAUTION Refer to "Caution" on page 60A-1.

1. Disconnect the negative battery cable.
2. Remove two instrument cluster trim mounting screws.



KIA163-60-1701-S

3. Disconnect instrument cluster switch connectors.

4. Remove the trim.

Inspection

- Inspect the trim for signs of any damage and replace as necessary.

Installation

1. Connect the five switch connectors.
2. Place the instrument cluster trim into place in front of the instrument cluster.
3. Install two screws.
4. Connect battery.

INSTRUMENT PANEL

Ashtray

Removal

- Remove the ashtray from the center panel.

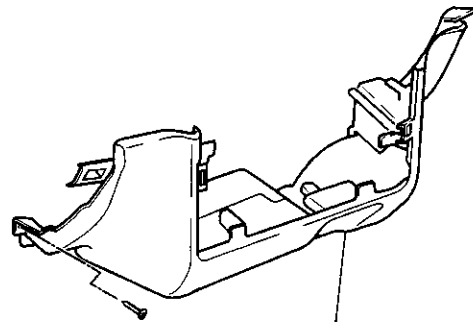
Installation

- Install the ashtray in the center panel.

Center Panel

Removal

1. Remove mounting screws.
2. Remove the center panel from the instrument panel.



Center panel

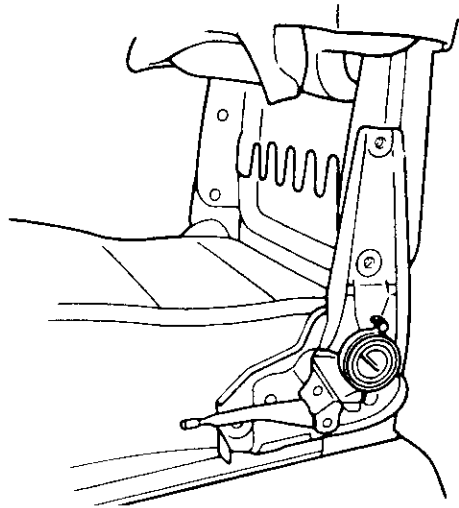
BN7A60018

Installation

1. Mount the center panel in the instrument panel.
2. Install center panel mounting screws.

Installation

- Reverse removal procedure.

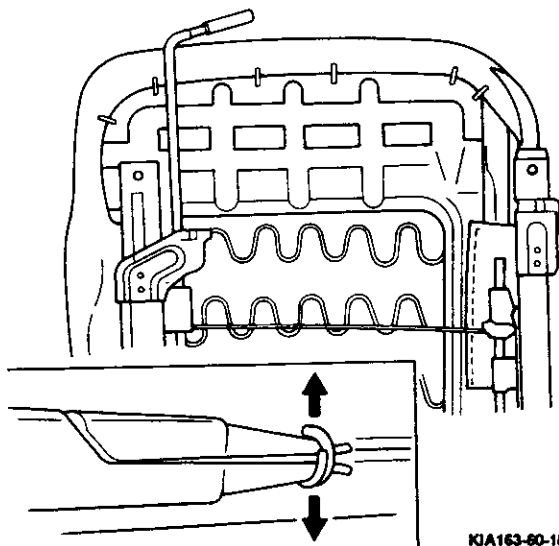


KIA163-60-1811-S

Cushion Cover

Removal

1. Remove the reclining lever.
2. Remove the hog rings on the underside of the seat cushion.

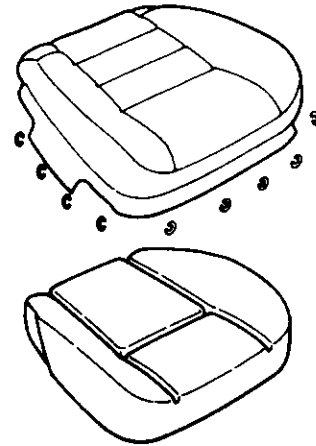


KIA163-60-1814-S

3. Unthread the control thread from the cover.
4. Pull cover off of the foam cushion.

Installation

1. Place cover over foam cushion.
2. Thread the control thread through the cover hems.
3. Install the hog rings.
4. Install reclining lever and seat back.

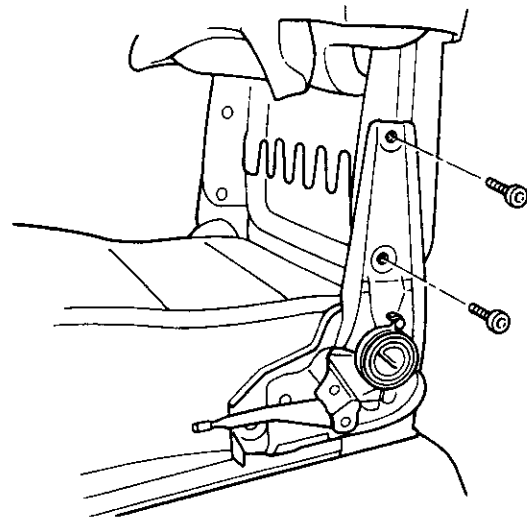


KIA163-60-1815-S

Reclining Knuckle

Removal

1. Follow seat back cover removal steps 1-8.
2. Pull up the trim until the upper two knuckle mounting bolts are exposed.
3. Remove the upper two hex head bolts and remove the seat back.



KIA163-60-1812-S

4. Pull the knuckle lever and push the seat into the reclining position.
5. Remove the two lower knuckle hex head bolts.
6. Remove the reclining knuckle.

Installation

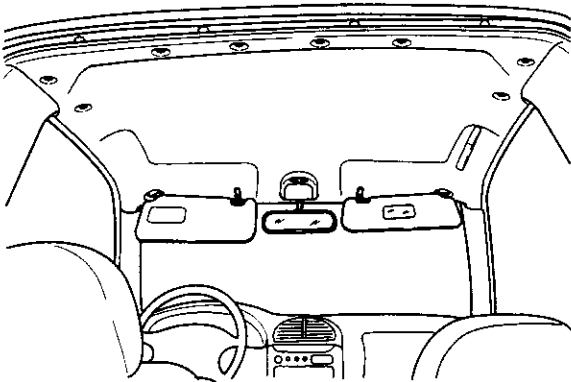
- Reverse removal procedures.

Tighten knuckle bolts to 33 lb-ft (45 N-m).

HEADLINER**Removal****Caution**

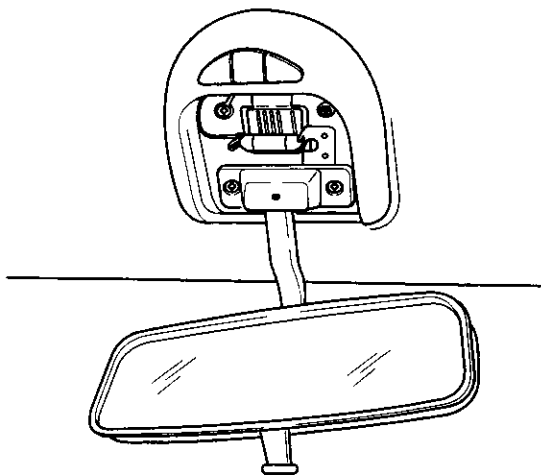
Refer to "Caution" on page 60B-1.

1. Disconnect the negative battery cable.
2. Remove two sun visors and a assist handle.



AN7A60B005

3. Remove the mirror cover and unscrew the mounting screws.
4. Remove the rearview mirror.
5. Gently remove the lens assembly on the dome light.
6. Remove the bulb.
7. Remove the three dome light mounting screws.
8. Disconnect the power connector and remove the dome light.

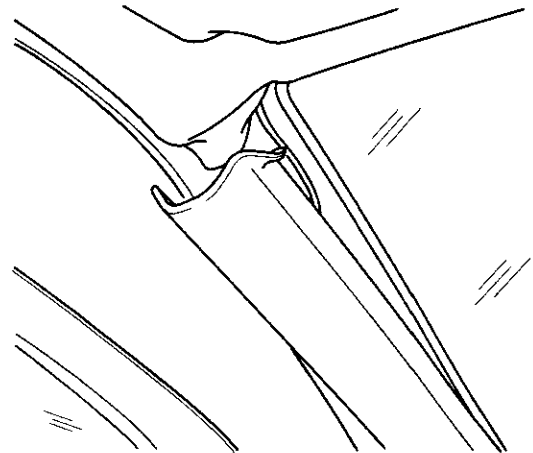


AN7A60B038

9. Remove A-pillar trims, then pull forward B-pillar upper trim carefully.
10. Remove the eight fasteners
11. Remove the headliner and insulation pads through the tailgate.

Installation

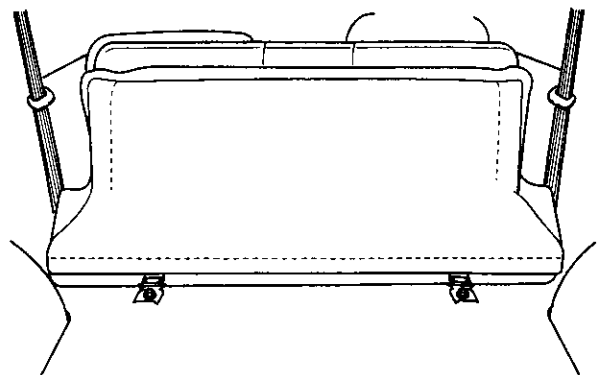
Install headliner in the reverse order of removal.



AN7A60B039

SEAT**Rear Seat****Removal**

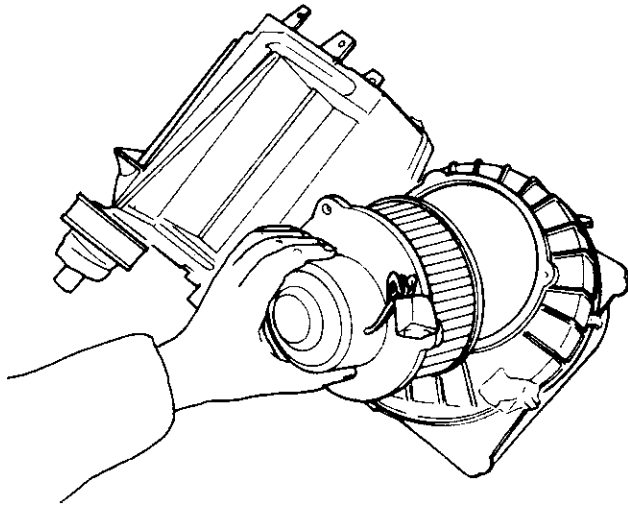
1. Slide the front seats forward(if not removed).
2. Remove two mounting bolts forward.
3. Pull the lock knobs and fold the rear seat down.
4. Rotate the seat forward.
5. Remove two mounting bolts backward.
6. Remove rear seat assembly through the back door.



AN7A60B032

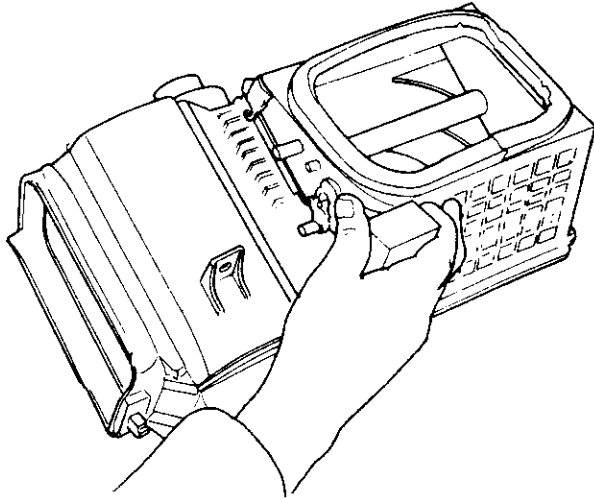
Installation

Install rear seat in the reverse order of removal.



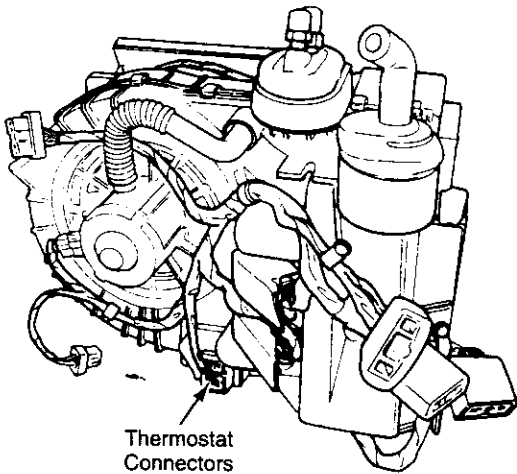
KIA163-62-14-S

9. Remove the four blower inlet duct screws.
10. Remove the blower inlet duct.



KIA163-62-15-S

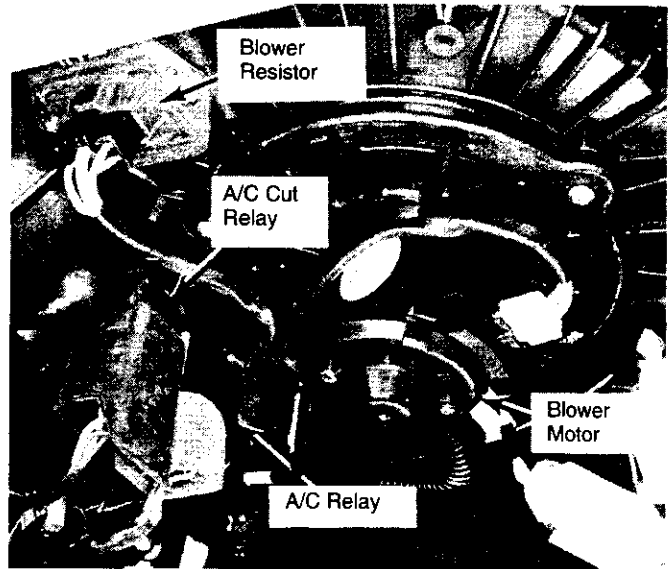
11. Remove the two wire connectors to the thermostat. (BRN wire on the left, BLU/WHT wire on the right.)



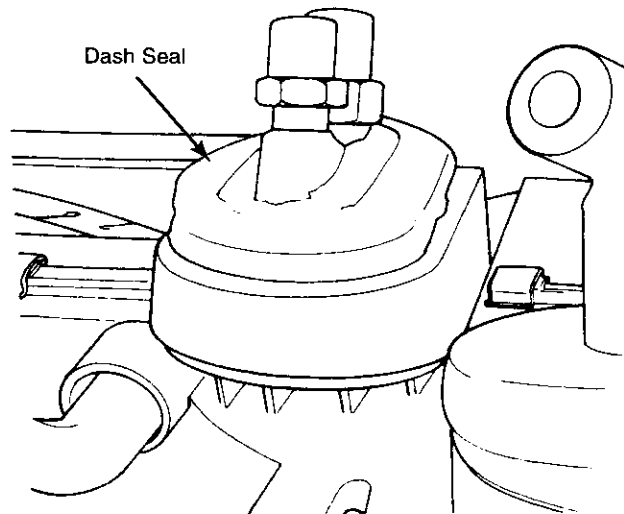
Thermostat Connectors

KIA163-62-16-S

12. Disconnect the connector to the A/C relay.
13. Remove two screws and remove the A/C relay.
14. Disconnect the connector to the A/C cut relay.
15. Remove two screws and remove the A/C cut relay.

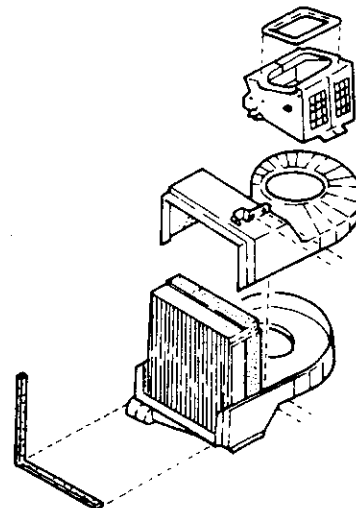


16. Remove the dash seal from around the evaporator core tube connections.
17. Detach eleven retaining clips holding the two halves of the blower housing unit together.



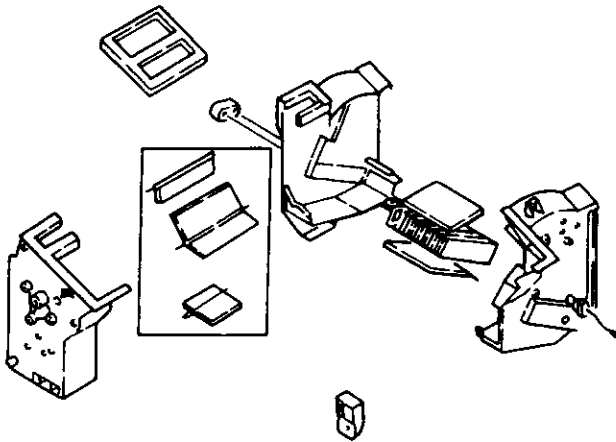
KIA163-62-18-S

18. Separate the two halves of the blower housing unit, exposing the evaporator and blower motor.



KIA163-62-19-S

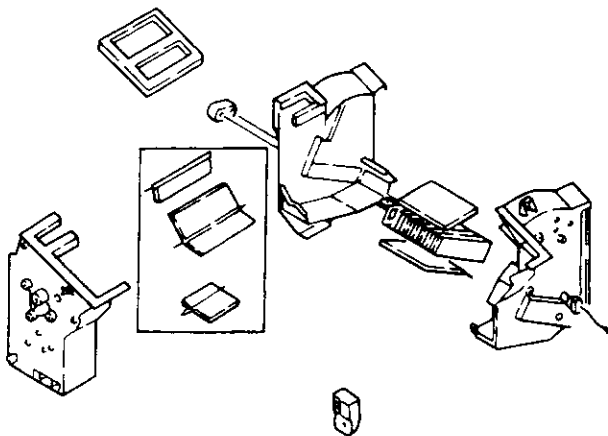
11. Disassemble the heater unit by removing the eight remaining retaining clips.
12. Remove the heater core from the unit assembly.



KJA163-62-33-S

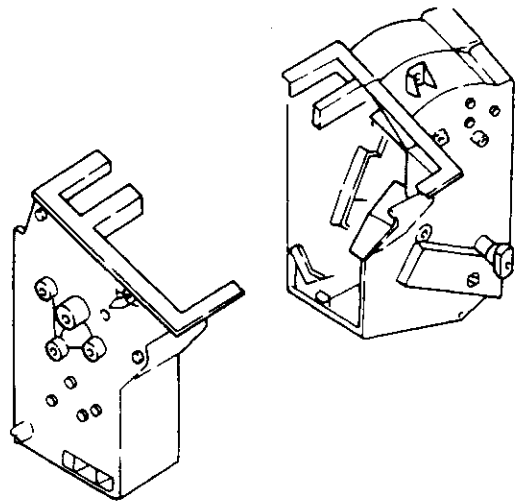
Assembly

1. Insert the heater core assembly into the heater unit assembly.
2. Attach the core tube mounting bracket to the housing with four screws.
Tighten the four screws to 53 lb-in (6 N·m).
3. Assemble the heater unit assembly around the heater core.
4. Attach the six retaining clips to keep the heater core housing assembled.



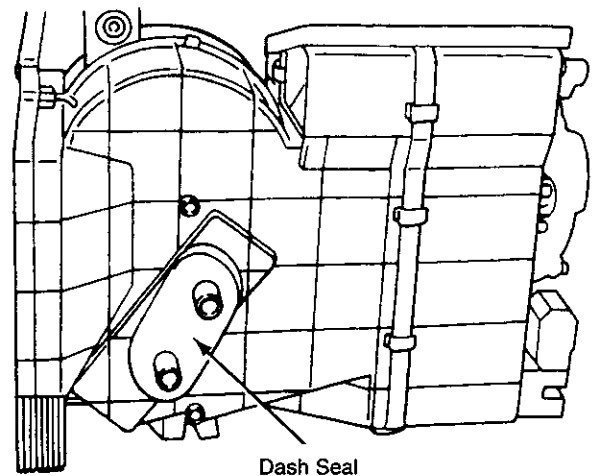
KJA163-62-33-S

5. Assemble the three sections of the heater unit together.
6. Attach eight retaining clips to hold the sections together.



KJA163-62-31-S

7. Replace the dash seal on the heater core tube connections.
8. Insert two screws to retain the wiring harness.
Tighten the two screws to 53 lb-in (6 N·m).



Dash Seal

KJA163-62-30-S