

RODEO

STEERING

POWER-ASSISTED STEERING SYSTEM

CONTENTS

Service Precaution	2A-2	Removal	2A-28
Diagnosis	2A-2	Inspection and Repair	2A-28
General Description	2A-8	Installation	2A-28
Power Steering System Test	2A-10	Supplemental Restraint System Steering	
Maintenance	2A-11	Wheel & Column	2A-29
Fluid Level	2A-11	Service Precaution	2A-29
Bleeding The Power Steering System	2A-11	SRS Connectors	2A-29
Bleeding Procedure	2A-11	Inflator Module	2A-31
Flushing The Power Steering System	2A-11	Inflator Module and Associated Parts	2A-31
Steering Wheel Free Play Inspection	2A-12	Removal	2A-31
Front End Alignment Inspection and		Inspection and Repair	2A-32
Adjustment	2A-12	Installation	2A-32
Main Data and Specifications	2A-16	Steering Wheel	2A-33
Special Tools	2A-17	Steering Wheel and Associated Parts	2A-33
Power Steering Unit	2A-18	Removal	2A-33
Power Steering Unit and Associated Parts	2A-18	Installation	2A-35
Removal	2A-18	Combination Switch	2A-36
Installation (4×2 Model)	2A-19	Combination Switch and Associated Parts	2A-36
Installation (4×4 Model)	2A-19	Removal	2A-36
Power Steering Unit Disassembled View	2A-20	Installation	2A-38
Disassembly	2A-21	Lock Cylinder	2A-40
Inspection and Repair	2A-21	Lock Cylinder and Associated Parts	2A-40
Reassembly	2A-21	Removal	2A-40
Main Data and Specifications	2A-21	Installation	2A-42
Special Tools	2A-22	System Inspection	2A-43
Power Steering Pump	2A-23	Steering Column	2A-44
Power Steering Pump and Associated		Steering Column and Associated Parts	2A-44
Parts	2A-23	Removal	2A-44
Removal	2A-23	Insepection	2A-46
Installation	2A-23	Installation	2A-48
Power Steering Pump Disassembled View	2A-24	System Inspection	2A-49
Disassembly	2A-24	Supplemental Restraint System Steering	
Inspection and Repair	2A-25	Wheel & Column and Associated Parts	2A-50
Reassembly	2A-25	Main Data and Specifications	2A-50
Main Data and Specifications	2A-27	Special Tools	2A-50
Transfer Gear Assembly	2A-28		
Transfer Gear Assembly and Associated			
Parts	2A-28		

Service Precaution

WARNING: THIS VEHICLE HAS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS). REFER TO THE SRS COMPONENT AND WIRING LOCATION VIEW IN ORDER TO DETERMINE WHETHER YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING. WHEN YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING, REFER TO THE SRS SERVICE INFORMATION. FAILURE TO FOLLOW WARNINGS COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY, OR OTHERWISE UNNEEDED SRS SYSTEM REPAIRS.

CAUTION: Always use the correct fastener in the proper location. When you replace a fastener, use **ONLY** the exact part number for that application. ISUZU will call out those fasteners that require a replacement after removal. ISUZU will also call out the fasteners that require thread lockers or thread sealant. **UNLESS OTHERWISE SPECIFIED, do not use supplemental coatings (Paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and the joint clamping force, and may damage the fastener. When you install fasteners, use the correct tightening sequence and specifications. Following these instructions can help you avoid damage to parts and systems.**

Diagnosis

Since the problems in steering, suspension, wheels and tires involve several systems, they must all be considered when diagnosing a complaint. To identify the symptom, always road test the vehicle first. Proceed with the following preliminary inspections and correct any defects which are found.

1. Inspect tires for proper pressure and uneven wear.
2. Raise vehicle on a hoist, then inspect front and rear suspension and steering linkage for loose or damaged parts.
3. Spin the front wheels. Inspect for out-of-round tires, out-of-balance tires, loose and/or rough hub unit bearings.

General Diagnosis

Condition	Possible Cause	Correction
Vehicle Pulls	Mismatched or uneven tires.	Replace tire.
	Tires not adequately inflated.	Adjust tire pressure.
	Broken or sagging springs.	Replace spring.
	Radial tire lateral force.	Replace tire.
	Improper wheel alignment.	Adjust wheel alignment.
	Brake dragging in one wheel.	Repair brake.
	Loose, bent or broken front or rear suspension parts.	Tighten or replace the appropriate suspension part(s).
	Faulty shock absorbers.	Replace shock absorber.
	Parts in power steering valve defective.	Replace power steering unit.
Abnormal or Excessive Tire Wear	Sagging or broken spring.	Replace spring.
	Tire out of balance.	Balance or replace tire.
	Improper wheel alignment.	Check front end alignment.
	Faulty shock absorber.	Replace shock absorber.
	Hard driving.	Replace tire.
	Overloaded vehicle.	Replace tire and reduce load.
	Tires not rotated periodically.	Replace or rotate tire.
	Worn Hub unit bearings.	Replace Hub unit bearing.
	Wobbly wheel or tires.	Replace wheel or tire.
	Tires not adequately inflated.	Adjust the pressure.

Condition	Possible Cause	Correction
Wheel Hop	Blister or bump on tire.	Replace tire.
	Improper shock absorber operation.	Replace shock absorber.
Shimmy, Shake or Vibration	Tire or wheel out of balance.	Balance wheels or replace tire/or wheel.
	Worn steering linkage ball joints.	Replace ball joints.
	Worn upper or lower end ball joints.	Replace ball joints.
	Excessive wheel run-out.	Repair or replace wheel and/or tire.
	Blister or bump on tire.	Replace tire.
	Excessive loaded radial run-out of tire/wheel assembly.	Replace tire or wheel.
	Improper wheel alignment.	Check wheel alignment.
	Loose or worn steering linkage.	Tighten or replace steering linkage.
	Loose steering unit.	Tighten steering unit.
	Tires not adequately inflated.	Adjust tire pressure.
	Loose, bent or broken front or rear suspension parts.	Tighten or replace the appropriate suspension parts.
	Faulty shock absorber.	Replace shock absorber.
	Hub bearing preload misadjustment.	Adjust preload.
	Parts in power steering valve defective.	Replace power steering unit.
Hard Steering	Bind in steering linkage ball studs, upper or lower end ball joint.	Replace ball joint.
	Improper wheel alignment.	Check wheel alignment.
	Tire not adequately inflated.	Inflate tires to proper pressure.
	Bind in steering column or shaft.	Repair or replace.
	Improper power steering system operation.	Repair or replace. <i>Refer to Power steering system diagnosis</i>
Too Much Play In Steering	Wheel bearings worn.	Replace wheel bearings.
	Loose steering unit or linkage.	Retighten or repair.
	Worn or loose steering shaft universal joint.	Retighten or replace steering shaft.
	Worn steering linkage ball joints.	Replace ball joints.
	Worn upper or lower end ball joints.	Replace ball joints.
Poor Steering Wheel Returnability	Bind in steering linkage ball joints.	Replace ball joints.
	Bind in upper or lower end ball joints.	Replace ball joints.
	Bind in steering column and shaft.	Repair or replace.
	Bind in steering gear.	Check and repair steering gear.
	Improper wheel alignment.	Adjust wheel alignment.
	Tires not adequately inflated.	Adjust tire pressure.
	Loose steering wheel nut.	Retighten.
	Worn wheel bearing.	Replace.

Condition	Possible Cause	Correction
Abnormal Noise	Worn, sticky or loose upper or lower ball joint, steering linkage ball joints or drive axle joints.	Replace.
	Faulty shock absorbers.	Replace.
	Worn upper or lower control arm bushing.	Replace.
	Loose stabilizer bar.	Retighten bolts or replace bushings.
	Loose wheel nuts.	Tighten nuts. Check for elongated wheel nut holes. Replace wheel if required.
	Loose suspension bolts or nuts.	Retighten suspension bolts or nuts.
	Broken or otherwise damaged wheel bearings.	Replace wheel bearing.
	Broken suspension springs.	Replace spring.
	Loose steering unit.	Retighten mounting bolt.
	Faulty steering unit.	Replace steering unit.
Wandering or Poor Steering Stability	Mismatched or unevenly worn tires.	Replace tire or inflate tires to proper pressure.
	Loose steering linkage ball joints.	Replace ball joints.
	Faulty shock absorbers.	Replace shock absorber.
	Loose stabilizer bar.	Tighten or replace stabilizer bar or bushings.
	Broken or sagging springs.	Replace spring (pairs).
	Improper wheel alignment.	Adjust wheel alignment.
Erratic Steering When Braking	Worn wheel bearings.	Replace wheel bearings.
	Broken or sagging springs.	Replace spring (pairs).
	Leaking caliper.	Repair or replace caliper.
	Warped discs.	Replace brake disc.
	Badly worn brake pads.	Replace brake pads.
	Tires are inflated unequally.	Inflate tires to proper pressure.

Power Steering System

There is some noise in all power steering systems. One of the most common is a hissing sound when the steering wheel is fully turned and the car is not moving. This noise will be most evident when the steering wheel is operated while the brakes are applied. There is no relationship between this noise and steering

performance. Do not replace the valve unless the "hissing" noise is extremely objectionable. A replacement valve will also have a slight noise, and is not always a cure for the condition.

Condition	Possible Cause	Correction
Rattle or Chucking Noise	Pressure hose touching other parts of vehicle.	Adjust hose position. Do not bend tubing by hand.
	Tie rod ends loose.	Tighten or replace tie rod end.
	Loose steering unit mounting.	Tighten steering unit mounting.
Poor Return of Steering Wheel to Center	Improper front wheel alignment.	Adjust front wheel alignment.
	Wheel bearing worn.	Replace front wheel bearing.
	Tie rod end binding.	Replace tie rod end.
	Ball joint binding.	Replace ball joint.
	Tight or frozen steering shaft bearing.	Replace steering assembly.
	Sticky or plugged steering unit valve.	Flush or replace steering unit.
	Entry of air in the power steering system.	Bleed the system.
Momentary Increase In Effort When Turning Wheel Fast To Right or Left	High internal leakage.	Repair steering gear.
	Power steering fluid level low.	Replenish fluid.
Steering Wheel Surges or Jerks When Turning Especially During Parking	Insufficient pump pressure.	Repair pump assembly.
	Sticky steering unit valve.	Flush or replace steering unit.
	Power steering fluid level low.	Replenish fluid.
Excessive Wheel Kick Back or Loose Steering	Air in system.	Bleed hydraulic system.
	Tie rod end loose.	Tighten tie rod end.
	Wheel bearing worn.	Replace wheel bearing.
Hard Steering or Lack of Power Assist	Sticky steering unit valve.	Flush or replace steering unit.
	Insufficient pump pressure.	Repair pump assembly.
	Excessive internal pump leakage.	Repair pump assembly.
	Excessive internal steering gear leakage.	Repair steering gear.
	Power steering fluid level low.	Replenish fluid.
Unstable Engine Idling or Stalling When Turning	Pressure switch of the power steering pump or its harness is faulty.	Repair or replace.

2A-6 POWER-ASSISTED STEERING SYSTEM

Power Steering Pump

Foaming milky power steering fluid, low fluid level, and possible low pressure can be caused by air in the fluid, or loss of fluid due to internal pump leakage. Check for leak and correct. Bleed the system. Extremely cold temperatures will cause air bubbles in the system if the

fluid level is low. If the fluid level is correct and the pump still foams, remove the pump from the vehicle and check housing for cracks. If the housing is cracked, replace the pump housing.

Condition	Possible Cause	Correction
Low Pressure Due to Steering Pump	Relief valve sticking or inoperative.	Replace relief valve.
	Side plate not flat against cam ring.	Replace side plate.
	Extreme wear of cam ring.	Replace cam ring.
	Scored side plate or rotor.	Replace side plate or rotor.
	Vanes sticking in rotor slots.	Repair or replace vanes and rotor.
	Cracked or broken side plate.	Replace side plate.
	High internal leakage.	Repair internal leakage.
Low Pressure Due to Steering Gear	Scored housing bore.	Replace housing.
Growling Noise In Steering Pump	Excessive back pressure in hoses or steering unit caused by restriction.	Repair steering unit or pump.
	Scored side plate or rotor.	Replace side plate or rotor.
	Worn cam ring.	Replace cam ring.
Groaning Noise In Steering Pump	Air in the fluid.	Bleed hydraulic system.
	Low fluid level.	Replenish fluid.
	Pump mounting loose.	Tighten mounting bolt.
Rattling Noise In Steering Pump	Vanes sticking in rotor slots.	Repair or replace vanes and rotor.
	Vane improperly installed.	Repair rotor and vane.
Swishing Noise In Steering Pump	Damaged relief valve.	Replace relief valve.
Whining Noise In Steering Pump	Scored side plate and vanes.	Replace side plate and vanes.

Steering Column Lock System

Condition	Possible Cause	Correction
Will Not Unlock	Damaged lock cylinder.	Replace lock cylinder.
	Damaged park lock cable.	Replace park lock cable.
Will Not Lock	Lock spring broken or worn.	Replace lock cylinder.
	Damaged lock cylinder.	Replace lock cylinder.
	Ignition switch stuck.	Repair or replace ignition switch.
	Park lock cable damaged.	Replace park lock cable.
Key Cannot be Removed in "OFF-LOCK"	Ignition switch is not set correctly.	Correct ignition switch.
	Damaged lock cylinder.	Replace lock cylinder.
	Faulty shift lock mechanism.	Repair or replace the shift lock mechanism.

Column

Condition	Possible Cause	Correction
Noise in Column	Universal joint loose.	Tighten joint.
	Shaft lock snap ring not seated.	Place snap ring in proper position.

Turn Signal Switch

This diagnosis covers mechanical problems only. Refer to *Turn Signal Switch in Electrical section for electrical diagnosis.*

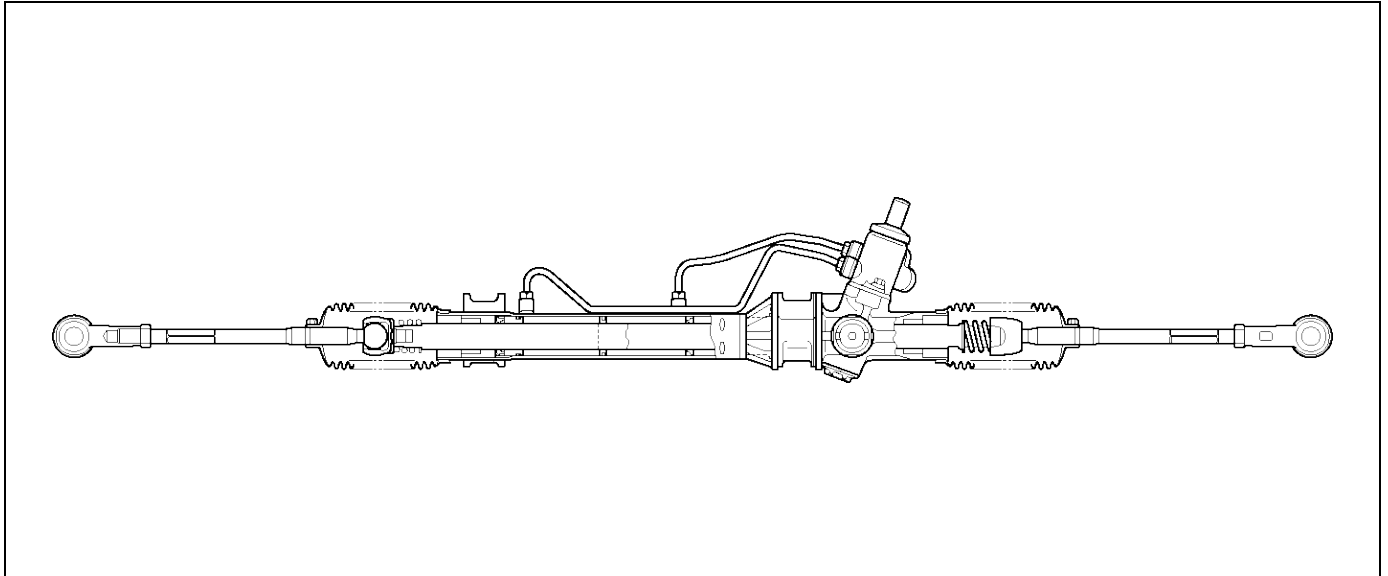
Condition	Possible Cause	Correction
Turn Signal Will Not Stay In Turn Position	Foreign material or loose parts preventing movement of yoke.	Repair or replace signal switch.
	Broken or missing detent or canceling spring.	Replace signal switch.
Turn Signal Will Not Cancel	Loose switch mounting screws.	Tighten mounting screws.
	Switch or anchor bosses broken.	Replace turn signal switch.
	Broken, missing or out of position detent, return or canceling spring.	Replace turn signal switch.
	Worn canceling cam.	Replace turn signal switch.
Turn Signal Difficult To Operate	Turn signal switch arm loose.	Tighten arm screw.
	Broken or distorted yoke.	Replace turn signal switch.
	Loose or misplaced springs.	Replace turn signal switch.
	Foreign parts and/or material.	Repair turn signal switch.
	Loose turn signal switch mounting screws.	Tighten mounting screws.
Turn Signal Will Not Indicate Lane Change	Broken lane change pressure pad or spring hanger.	Replace turn signal switch.
	Broken, missing or misplaced lane change spring.	Replace turn signal switch.
	Base of wire damaged.	Replace turn signal switch.
Hazard Switch Cannot Be Turned Off	Foreign material between hazard switch to turn signal switch body.	Repair or replace hazard switch.
No Turn Signal Lights	Electrical failure in chassis harness.	Refer to <i>Electrical</i> section.
	Inoperative turn signal flasher unit.	Replace flasher unit.
	Loose chassis harness connector.	Repair loose connector.
Front or Rear Turn Signal Lights Not Flashing	Burned-out or damaged turn signal bulb.	Replace bulb.
	High resistance connection to ground at bulb socket.	Repair bulb socket.
	Loose chassis harness connector.	Repair loose connector.

2A-8 POWER-ASSISTED STEERING SYSTEM

General Description

The hydraulic power steering system consists of a pump, an oil reservoir, a steering unit, a pressure hose and a return hose.

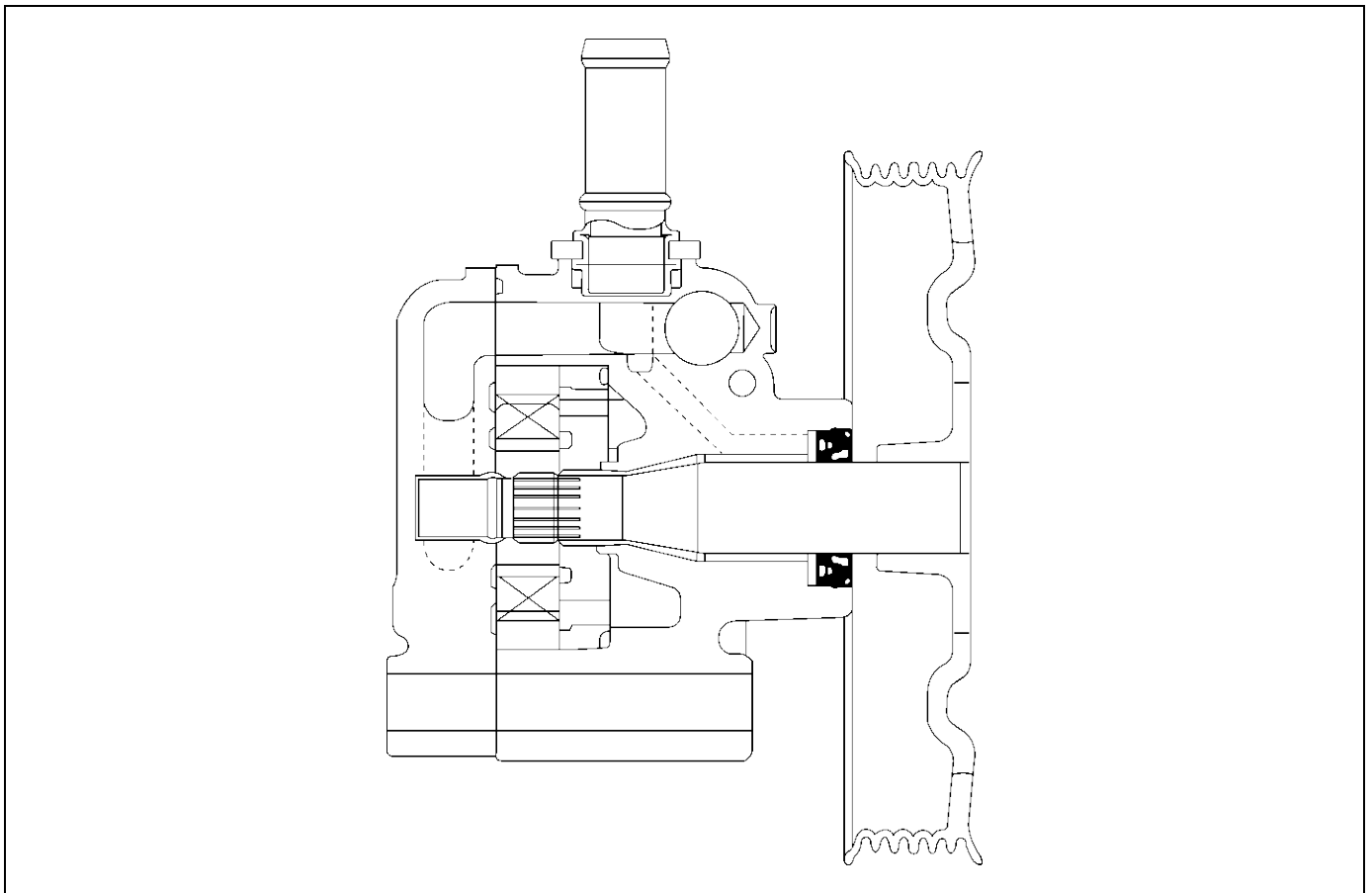
Power Steering Unit



A02RW001

The power steering unit is rack and pinion type.
The toe-in angle can be adjusted by turning the rod on each side.
The steering housing cannot be disassembled.

Hydraulic Pump



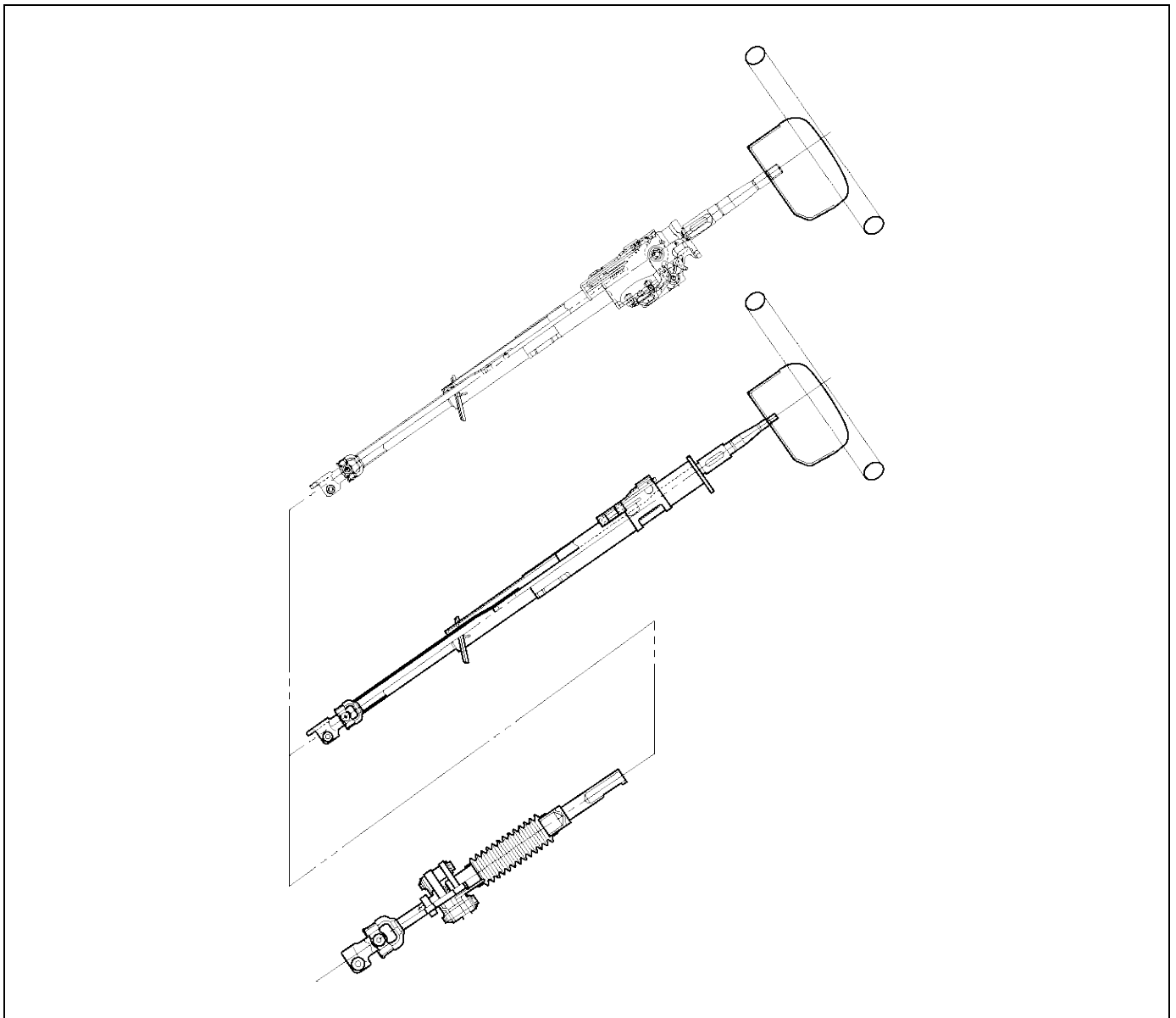
A02RX002

The hydraulic pump is vane-type design. The submerged pump has housing and internal parts that are inside the reservoir and operate submerged in oil. There are two bore openings at the rear of the pump housing. The larger opening contains the cam ring, pressure plate, thrust plate, rotor and vane assembly, and end plate. The smaller opening contains the pressure line union, flow control valve and spring. The flow control orifice is part of the pressure line union. The pressure relief valve inside the flow control valve limits the pump pressure.

Pressure Switch

When hydraulic pressure reaches 3430 kPa (500 psi), the pressure switch of the power steering pump closes causing the Powertrain Control Module (PCM) to actuate the throttle valve, which increases the engine rpm to prevent the overload-induced engine speed slow down. The switch opens when hydraulic pressure drops to 2940 kPa (430 psi).

Steering Column



431RY00004

WARNING: TO AVOID DEPLOYMENT WHEN TROUBLE-SHOOTING THE SRS SYSTEM, DO NOT USE ELECTRICAL TEST EQUIPMENT, SUCH AS BATTERY-POWERED OR A/C-POWERED VOLT-METER, OHMMETER, ETC., OR ANY TYPE OF ELECTRICAL EQUIPMENT OTHER THAN SPECIFIED IN THIS MANUAL. DO NOT USE A NON-POWERED PROBE-TYPE TESTER.

INSTRUCTION IN THIS MANUAL MUST BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

When servicing a vehicle equipped with Supplemental Restraint System, pay close attention to all WARNINGS and CAUTIONS.

For detailed explanation about SRS, refer to *Restraints* section.

2A-10 POWER-ASSISTED STEERING SYSTEM

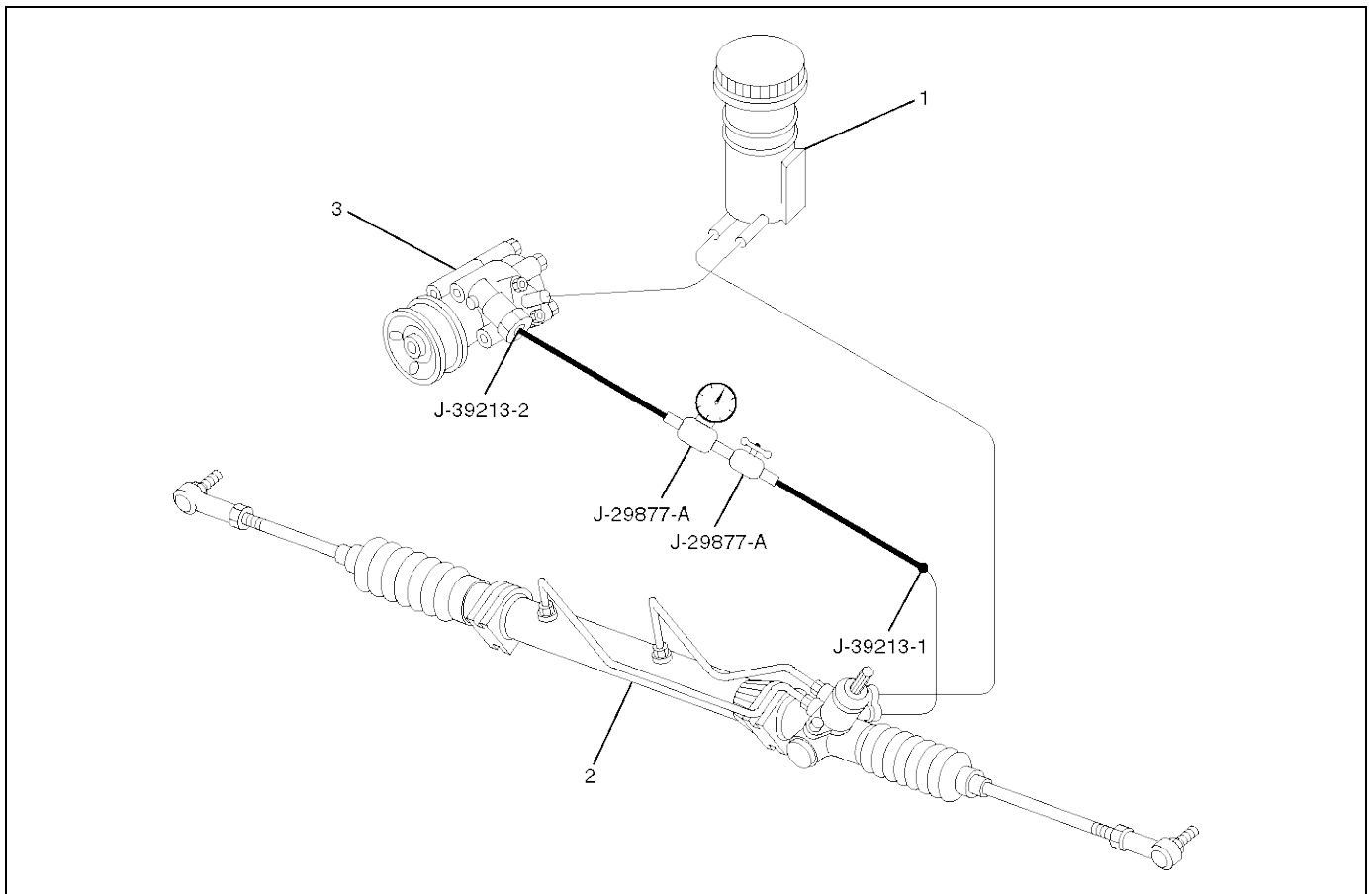
The steering column has three important features in addition to the steering function:

1. The column is energy absorbing, designed to compress in a front-end collision to minimize the possibility of injury to the driver of the vehicle.
2. The ignition switch and lock are mounted conveniently on the column.
3. With the column mounted lock, the ignition and steering operation can be locked to prevent theft of the vehicle.

The column can be disassembled and reassembled. However, to insure the energy absorbing action, use only the specified screws, bolts and nuts as designated, and tighten them to the specified torque. Handle the column with care when it is removed from the vehicle. A sharp blow on the end of steering shaft or shift lever, or dropping the assembly could shear or loosen the fasteners that maintain column rigidity.

Power Steering System Test

Test Procedure



Legend

(1) Fluid Reservoir

(2) Power Steering Unit

(3) Power Steering Pump

Test of fluid pressure in the power steering system is performed to determine whether or not the oil pump and power steering unit are functioning normally. The power steering system test is used to identify and isolate hydraulic circuit difficulties. Prior to performing this test, the following inspections and corrections, if necessary, must be made.

- Inspect pump reservoir for proper fluid level.
- Inspect pump belt for proper tension.
- Inspect pump driver pulley condition.

1. Place a container under the pump to catch the fluid when disconnecting or connecting the hoses.
2. With the engine NOT running, disconnect the pressure hose at the power steering pump and install power steering tester J-29877-A. The gage must be between the shutoff valve and pump. Open the shutoff valve.
3. Check the fluid level. Fill the reservoir with power steering fluid, to the "Full" mark. Start the engine, then turn the steering wheel and momentarily hold it against a stop (right or left). Turn the engine off and check the connections at tester for leakage.

C02RW001

4. Bleed the system. Refer to *Bleeding the Power Steering System* in this section.
5. Start the engine and check the fluid level. Add power steering fluid if required. When the engine is at normal operating temperature, increase engine speed to 1500 rpm.

CAUTION: Do not leave shutoff valve fully closed for more than 5 seconds, as the pump could become damaged internally.

6. Fully close the shutoff valve. Record the highest pressures.
 - If the pressure recorded is within 9300–9800 kPa (1350–1420 psi), the pump is functioning within its specifications.
 - If the pressure recorded is higher than 9800 kPa (1420 psi), the valve in the pump is defective.
 - If the pressure recorded is lower than 9300 kPa (1350 psi), the valve or the rotating group in the pump is defective.
7. If the pump pressures are within specifications, leave the valve open and turn (or have someone else turn) the steering wheel fully in both directions. Record the highest pressures and compare with the maximum pump pressure recorded in step 6. If this pressure cannot be built in either side of the power steering unit, the power steering unit is leaking internally and must be replaced.
8. Shut the engine off, remove the testing gauge.
9. Reconnect the pressure hose, check the fluid level and make the needed repairs.
10. If the problem still exists, the steering and front suspension must be thoroughly examined.

Maintenance

The hydraulic system should be kept clean and fluid level in the reservoir should be checked at regular intervals and fluid added when required. Refer to *Recommended Fluids and Lubricants in General Information* section for the type of fluid to be used and the intervals for filling.

If the system contains some dirt, flush it as described in this section. If it is exceptionally dirty, the pump must be completely disassembled before further usage. (The steering unit cannot be disassembled.)

All tubes, hoses, and fittings should be inspected for leakage at regular intervals. Fittings must be tight. Make sure the clips, clamps and supporting tubes and hoses are in place and properly secured.

Power steering hoses and lines must not be twisted, kinked or tightly bent. Air in the system will cause spongy action and noisy operation. When a hose is disconnected or when fluid is lost, for any reason, the system must be bled after refilling. Refer to *Bleeding the Power Steering System* in this section.

- Inspect belt for tightness.
- Inspect pulley for looseness or damage. The pulley should not wobble with the engine running.
- Inspect hoses so they are not touching any other parts of the vehicle.
- Inspect fluid level and fill to the proper level.

Fluid Level

1. Run the engine until the power steering fluid reaches normal operating temperature, about 55°C (130°F), then shut the engine off.
2. Check the level of fluid in the reservoir.
3. If the fluid level is low, add power steering fluid as specified in General Information to the proper level and install the receiver cap.
4. When checking the fluid level after the steering system has been serviced, air must be bled from the system. Refer to *Bleeding the Power Steering System* in this section.

Bleeding The Power Steering System

When a power steering pump or unit has been installed, or an oil line has been disconnected, the air that has entered the system must be bled out before the vehicle is operated. If air is allowed to remain in the power steering fluid system, noisy and unsatisfactory operation of the system may result.

Bleeding Procedure

When bleeding the system, and any time fluid is added to the power steering system, be sure to use only power steering fluid as specified in General Information.

1. Fill the pump fluid reservoir to the proper level and let the fluid settle for at least two minutes.
2. Start the engine and let it run for a few seconds. Do not turn the steering wheel. Then turn the engine off.
3. Add fluid if necessary.
4. Repeat the above procedure until the fluid level remains constant after running the engine.
5. Raise and support the front end of the vehicle so that the wheels are off the ground.
6. Start the engine. Slowly turn the steering wheel right and left, lightly contacting the wheel stops.
7. Add power steering fluid if necessary.
8. Lower the vehicle, set the steering wheel at the straight forward position after turning it to its full steer positions 2 or 3 times, and stop the engine.
9. Check the fluid level and refill as required.
10. If the fluid is extremely foamy, allow the vehicle to set a few minutes, then repeat the above procedure.

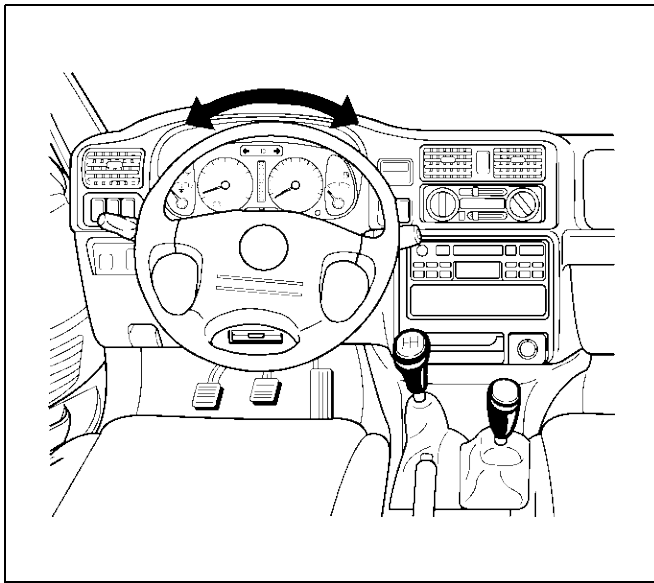
Flushing The Power Steering System

1. Raise and support the front end of the vehicle off the ground until the wheels are free to turn.
2. Remove the fluid return line at the pump inlet connector and plug the connector port on the pump. Position the line toward a large container to catch the draining fluid.
3. While running the engine at idle, fill the reservoir with new power steering fluid. Turn the steering wheel in both directions. Do not contact or hold the steering wheel to the wheel stops. This will cause the pump to go to pressure relief mode, which may cause a sudden fluid overflow at the reservoir.

2A-12 POWER-ASSISTED STEERING SYSTEM

4. Install all the lines and hoses. Fill the system with new power steering fluid and bleed the system as described in Bleeding The Power Steering System. Operate the engine for about 15 minutes. Remove the pump return line at the pump inlet and plug the connection on the pump. While refilling the reservoir, check the draining fluid for contamination. If foreign material is still evident, replace all lines, disassemble and clean or replace the power steering system components. Do not re-use any drained power steering fluid.

Steering Wheel Free Play Inspection



1. With the tires in the straight-ahead position, check the amount of steering wheel play by turning the wheel in both directions until the tires begin to move.

NOTE: The wheel free play should be checked with the engine running.

Free play: 0 – 30mm (0 – 1.18in)

2. Also check the steering wheel for play and looseness in the mount by moving it back and forth and sideways. When test driving, check for hard steering, steering shimmy and tendency to pull to one side.

Front End Alignment Inspection and Adjustment

General Description

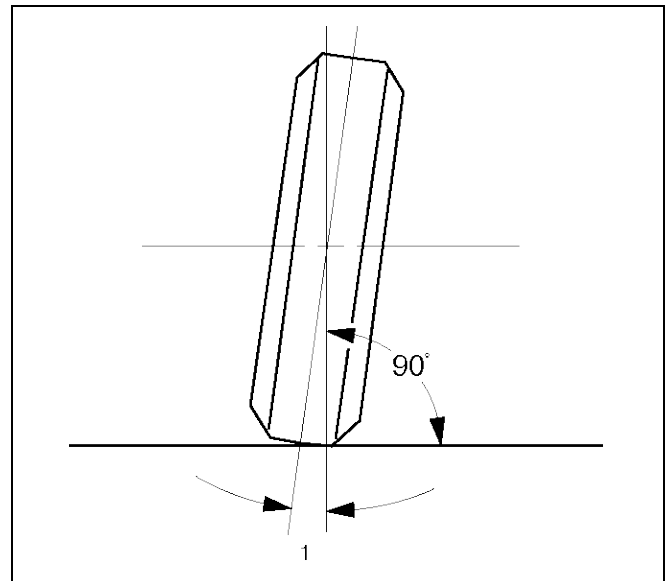
"Front End Alignment" refers to the *angular relationship between the front wheels*, the front suspension attaching parts and the ground.

Proper front end alignment must be maintained in order to insure efficient steering, good directional stability and to prevent abnormal tire wear.

The most important factors of front end alignment are wheel toe-in, wheel camber and axle caster.

Camber:

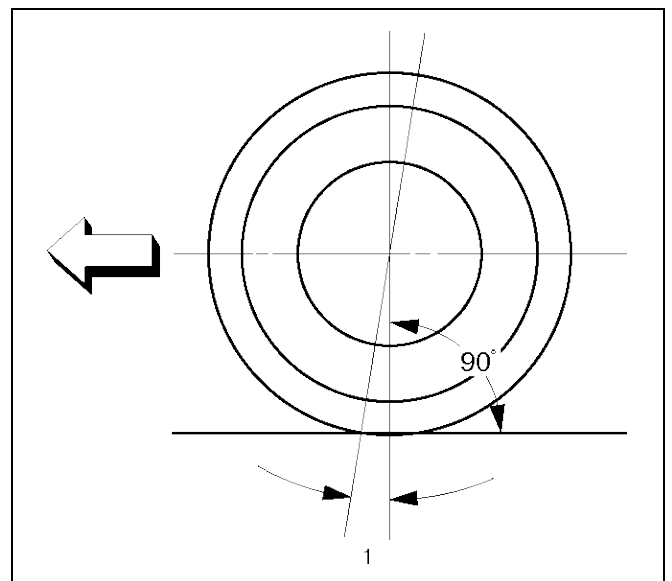
This illustration shows view from the front of the vehicle.



Camber is the vertical tilting inward or outward of the front wheels. When the wheels tilt outward at the top, the camber is positive (+). When the wheels tilt inward at the top, the camber is negative (-). The amount of tilt measured in degrees from the vertical is called the camber angle (1). If camber is extreme or unequal between the wheels, improper steering and excessive tire wear will result. Negative camber causes wear on the inside of the tire, while positive camber causes wear to the outside.

Caster:

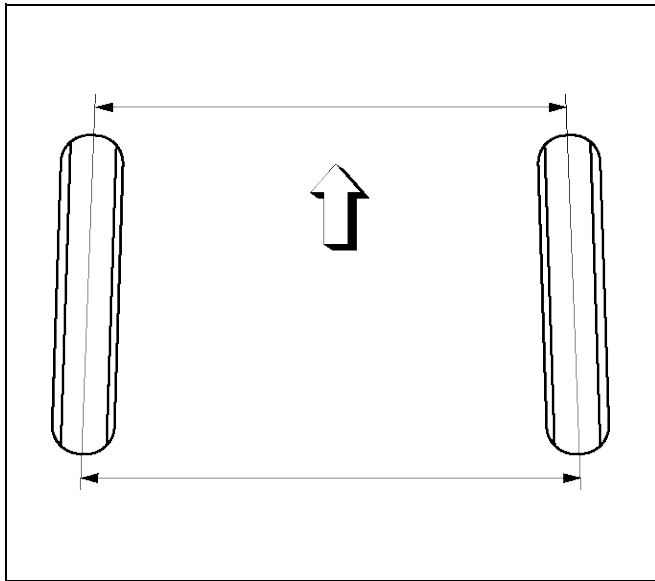
This illustration shows view from the side of the vehicle.



Caster (1) is the vertical tilting of the wheel axis either forward or backward (when viewed from the side of the vehicle). A backward tilt is positive (+) and a forward tilt is negative (-). On the short and long arm type suspension you cannot see a caster angle without a special instrument, but if you look straight down from the top of the upper control arm to the ground, the ball joints do not line up (fore and aft) when a caster angle other than 0 degree is present. With a positive angle, the lower ball joint would be slightly ahead (toward the front of the vehicle) of the upper ball joint center line.

Toe-in:

This illustration shows view from the top of the vehicle.



Toe-in is the measured amount the front wheels are turned in. The actual amount of toe-in is normally a fraction of a degree. Toe-in is measured from the center of the tire treads or from the inside of the tires. The purpose of toe-in is to insure parallel rolling of the front wheels and to offset any small deflections of the wheel support system which occurs when the vehicle is rolling forward. Incorrect toe-in results in excessive toe-in and unstable steering. Toe-in is the last alignment to be set in the front end alignment procedure.

Inspection

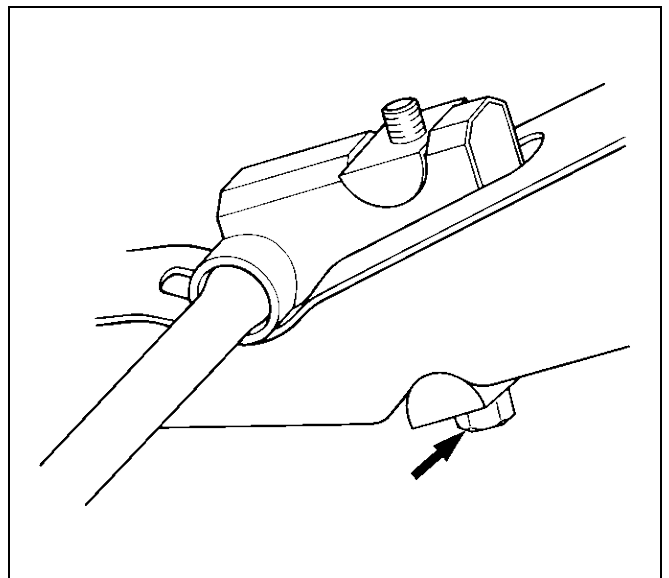
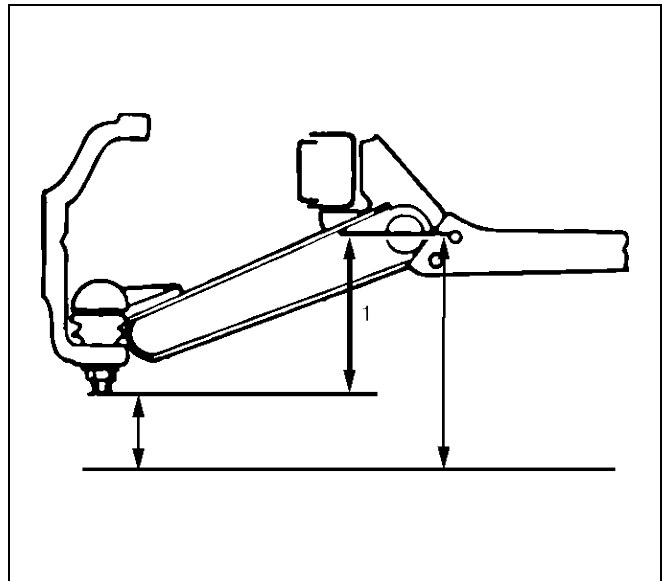
Before making any adjustments affecting caster, camber or toe-in, the following front end inspection should be made.

1. Inspect the tires for proper inflation pressure. Refer to *Main Data and Specifications in Wheel and Tire System* section.
2. Make sure that the vehicle is unladen condition (With no passenger or loading).
3. Make sure that the spare tire is installed at the normal position.
4. Inspect the front wheel bearings for proper adjustment. Refer to *Front Hub and Disc Overhaul in Suspension* section.
5. Inspect the ball joints and tie rod ends. If excessive looseness is noted, correct before adjusting. Refer to *Steering Linkage* in this section.
6. Inspect the wheel and tires for run-out. Refer to *Wheel Replacement in Wheel and Tire System* section.
7. Inspect the trim height. If not within specifications, the correction must be made before adjusting caster.
8. Inspect the steering unit for looseness at the frame.
9. Inspect shock absorbers for leaks or any noticeable noise. Refer to *Shock Absorber in Suspension* section.
10. Inspect the control arms or stabilizer bar attachment for looseness. Refer to *Suspension* section.
11. Inspect the front end alignment using alignment equipment. Follow the manufacturer's instructions.
12. Park the vehicle on a level surface.

Trim Height Adjustment

Adjust the trim height (1) by means of the adjusting bolt on the height control arms.

CAUTION: When adjusting front end alignment, be sure to begin with trim height first, as it may change other adjusted alignments.



2A-14 POWER-ASSISTED STEERING SYSTEM

1. Check and adjust the tire inflation pressures.
2. Park the vehicle on a level ground and move the front of the vehicle up and down several times to settle the suspension.
3. Make necessary adjustment with the adjusting bolt on the height control arms.

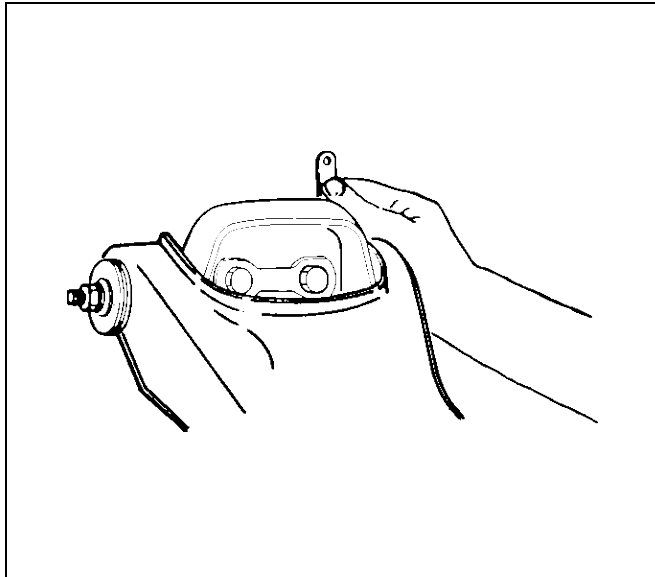
Trim height: $119 \pm 5\text{mm}$ ($4.69 \pm 0.2\text{in}$)

Caster Adjustment

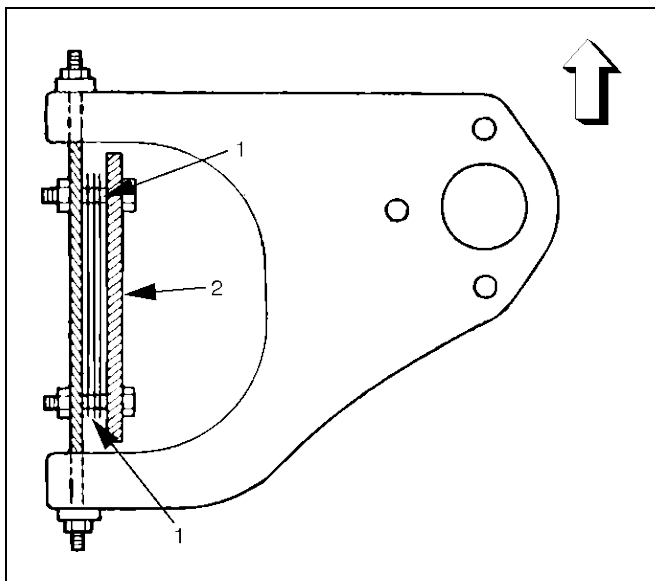
The caster angle can be adjusted by means of the caster shims (1) installed between the chassis frame (2) and fulcrum pins.

Caster angle: $2^{\circ}30' \pm 1^{\circ}$

CAUTION: Left and right side must be equal within $30'$.



450RW006



450RS002

NOTE: Difference of the caster shim front/rear thickness should be 3.6mm (0.142in) or less. Overall thickness of caster shim and camber shim should be 10.8mm (0.425in) or less.

Tighten the fulcrum pin bolt to the specified torque.

Torque: $152\text{N}\cdot\text{m}$ 112 (lbft)

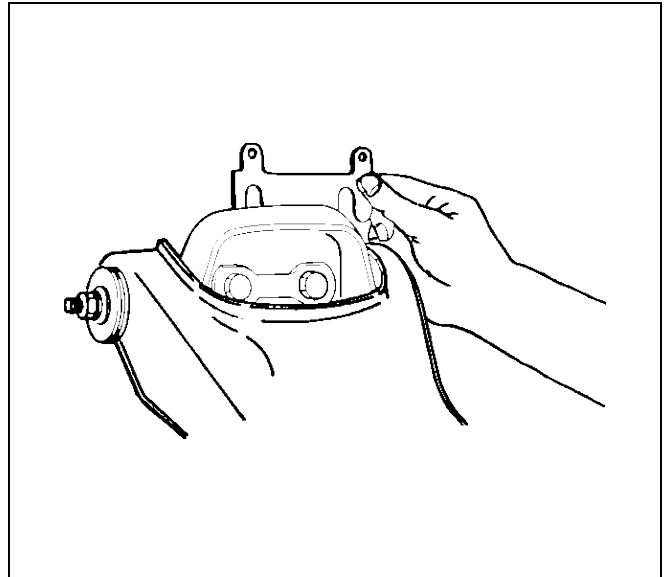
Camber Adjustment

The camber angle can be adjusted by means of the camber shims (2) installed in position between the chassis frame (1) and fulcrum pins.

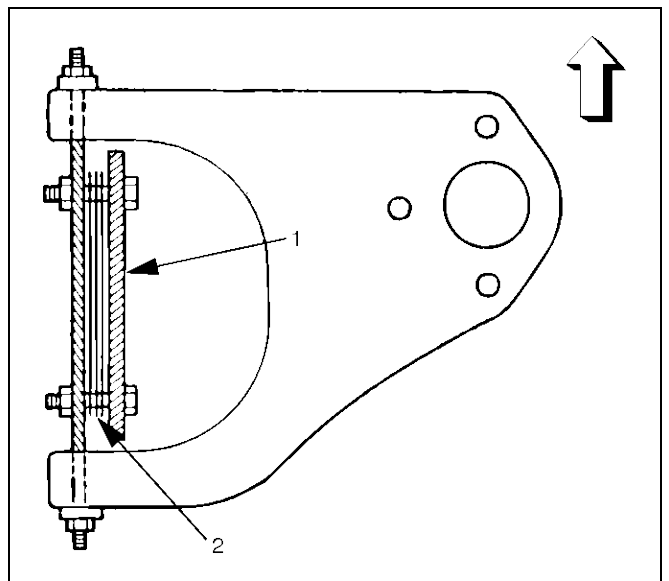
Camber angle: $0^{\circ} \pm 30'$

King pin inclination: $12^{\circ}30' \pm 30'$

CAUTION: Left and right side must be equal within $30'$.



450RW007



450RS005

NOTE: Overall thickness of caster shim and camber shim should be 10.8mm (0.425in) or less.
Tighten the fulcrum pin bolt to the specified torque.

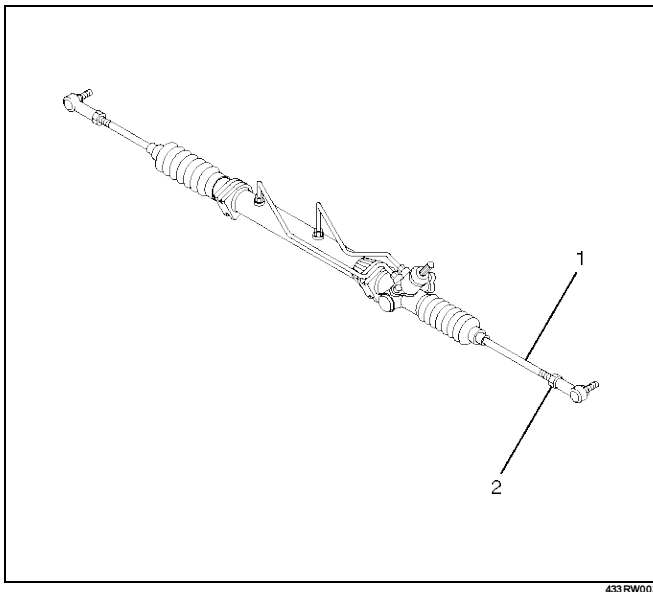
Torque: 152N·m (112lbft)

	Position of shims		Camber angle	Caster angle
	Front side	Rear side		
Caster shim	When added	When removed	Decreases	Decreases
	When removed	When added	Increases	Increases
	—	When removed	Unchanged	Decreases
	—	When added	Unchanged	Increases
Camber shim	When added		Decreases	Unchanged
	When removed		Increases	Unchanged

Toe-in Adjustment

1. To adjust the toe-in angle, loosen the lock nuts (2) on the tie rod (1) and turn the tie rod. Turn both rods the same amount, to keep the steering wheel centered .

Toe-in: 0 to +2mm (0 to +0.08in)



433 RW003

2. Tighten the lock nut to the specified torque.

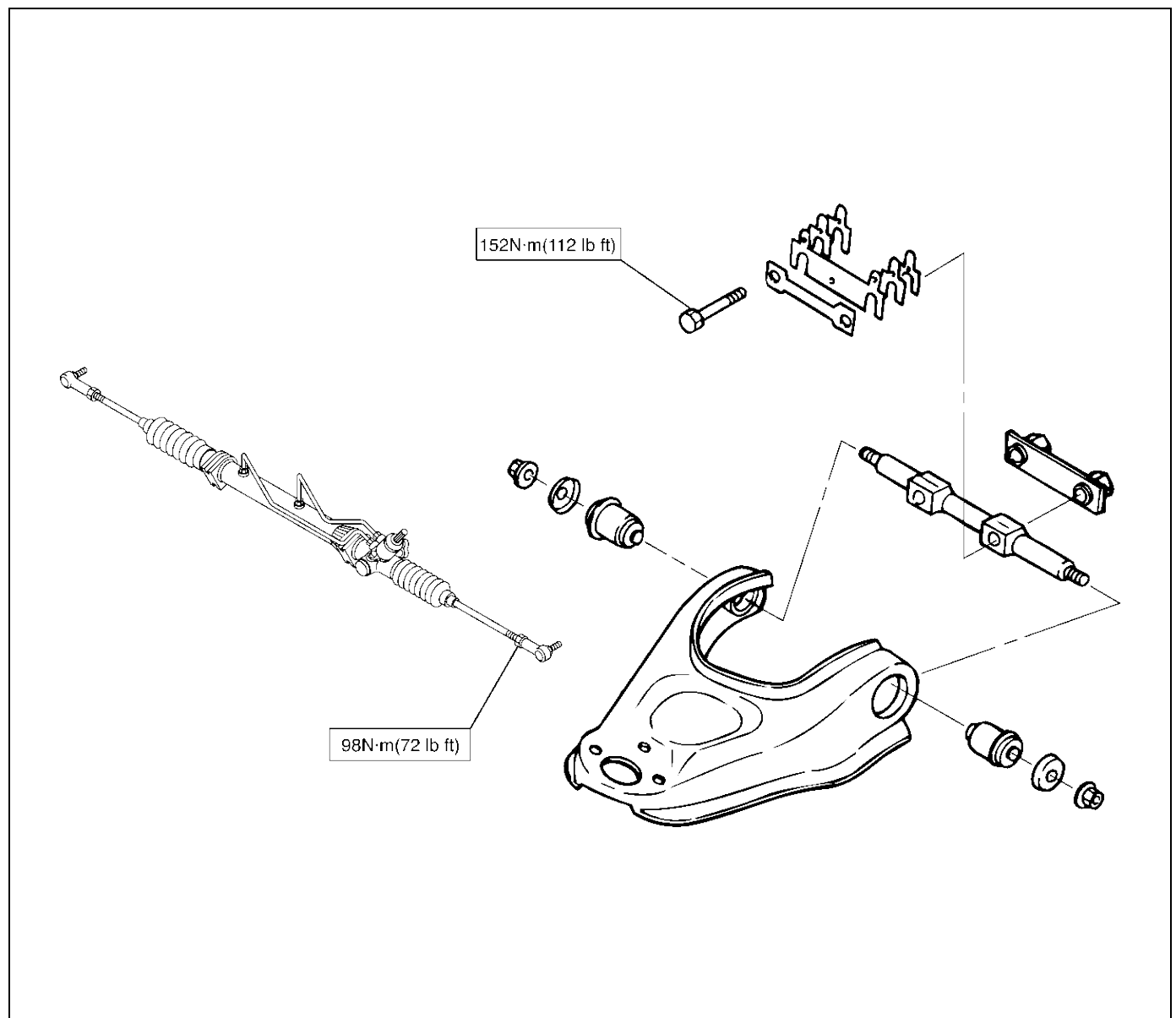
Torque: 98N·m (72lbft)

Main Data and Specifications

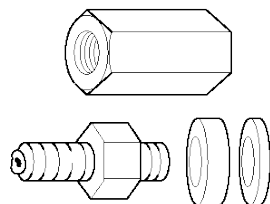
General Specification

Caster		$2^{\circ}30' \pm 1^{\circ}$
Camber		$0^{\circ} \pm 30'$
King pin inclination		$12^{\circ}30' \pm 30'$
Toe-in		0 to +2mm (0 to +0.08in)
Max. steering angle	inside	32.6° (+ $0^{\circ}30'$ to $-2^{\circ}30'$)
	outside	31.8°

Torque Specification

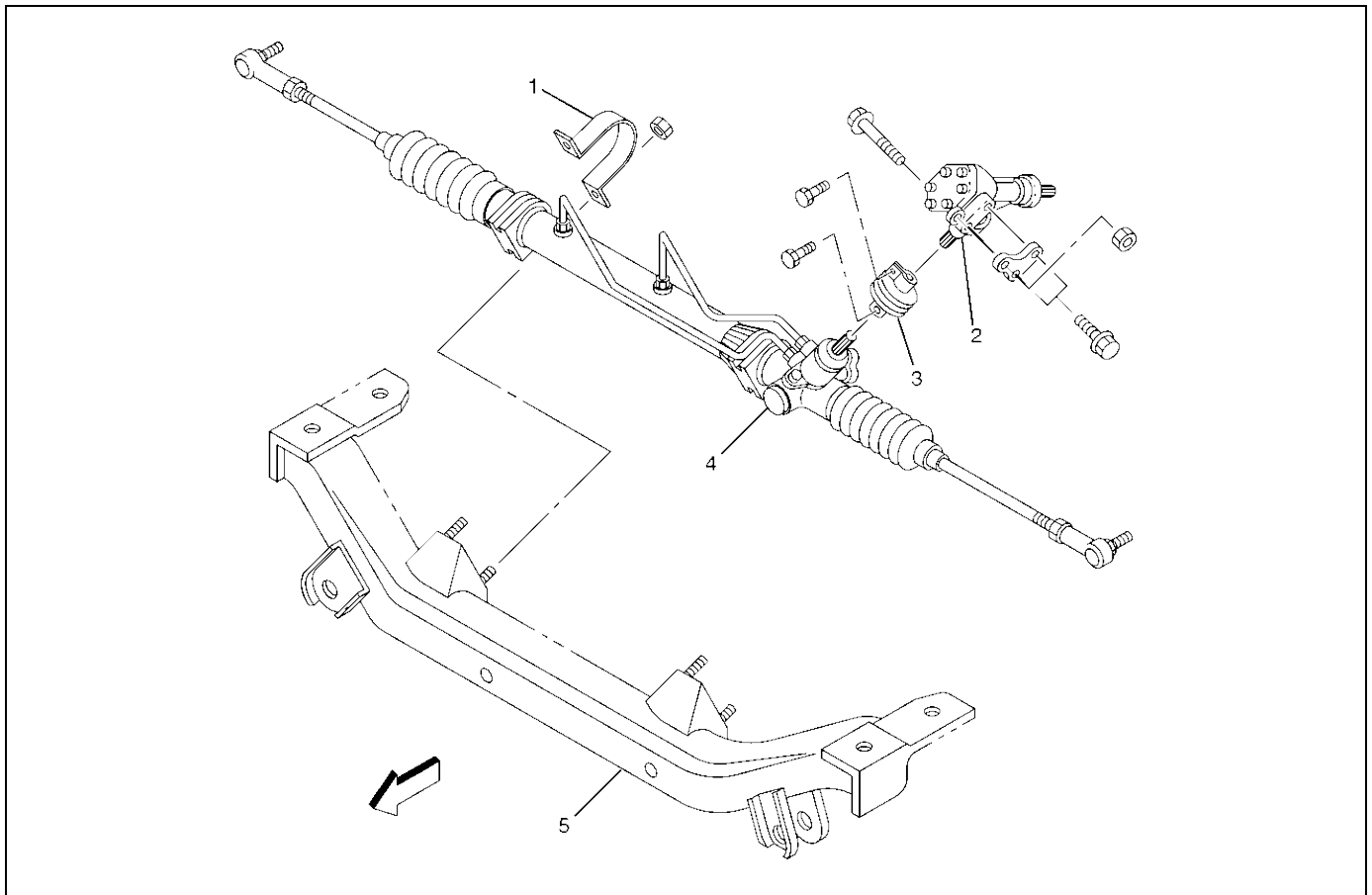


Special Tools

ILLUSTRATION	TOOL NO. TOOL NAME
 901RS276	J-29877-A Tester; Power steering
 901RS276	J-39213 Adapter; Power steering tester

Power Steering Unit

Power Steering Unit and Associated Parts



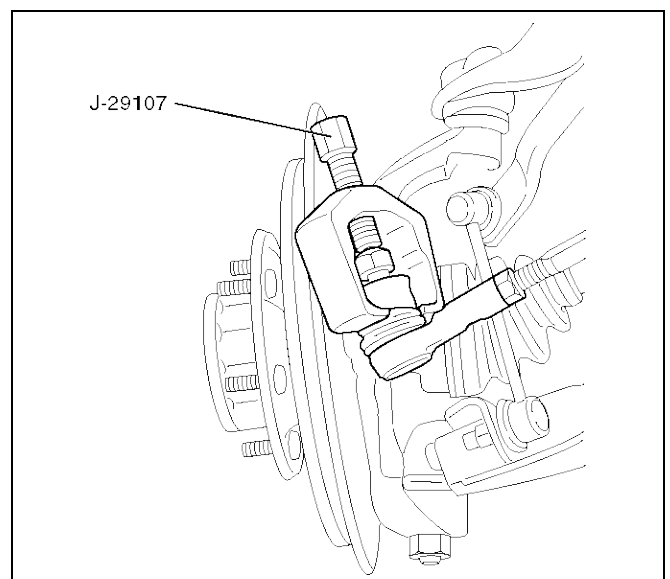
440R100001

Legend

- | | |
|----------------------------|----------------------------------|
| (1) Bracket | (3) Joint Assembly |
| (2) Transfer Gear Assembly | (4) Power Steering Unit Assembly |
| | (5) Crossmember |

Removal

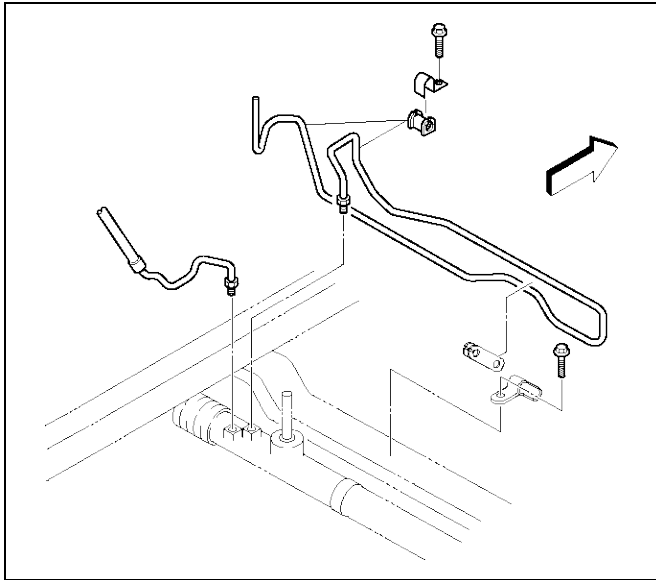
1. Remove the stone guard.
2. Remove the transfer gear assembly and universal joint assembly.
Make a setting mark across the coupling flange and steering unit to ensure reassembly of the parts in the original position.
3. Drain power steering fluid.
4. Remove the tie rod end assembly from knuckle.
Use tie rod end remover J-29107.



433RW002

5. Disconnect the feed line and return line from steering unit.
Remove the clips on the crossmember and frame.
Wire the power steering line to frame.

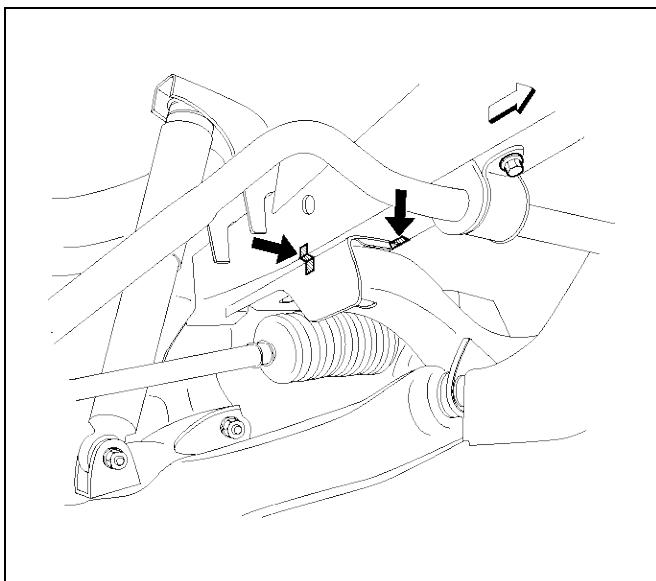
NOTE: Take care to prevent foreign matter from entry when disconnect the power steering line.



436 RW001

4×4 model:

1. Remove the torsion bar. Refer to *Front Suspension in Suspension* section.
2. Remove the lower control arm bolt (Frame side). Refer to *Front Suspension in Suspension* section.
3. Apply a setting mark across the crossmember and frame so parts can be reassembled in their original position.



431RX013

4. Remove the crossmember fixing bolt.
5. Remove the power steering unit with the crossmember.

6. Remove the power steering unit.

4×2 model:

1. Remove the power steering unit from the crossmember.

Installation (4×2 Model)

1. Install power steering unit to crossmember.
Tighten fixing bolt to specified torque.

Torque: 116N·m (85lb ft)

2. Connect the feed line and return line.

Torque: 25N·m (18lb ft)

3. Install tie-rod end assembly to knuckle.

Torque: 118N·m (87lb ft)

- 4.

- a Align the setting marks made at removal.
Install the universal joint assembly to the transfer gear assembly.
Temporary tighten the universal joint bolt.
- b Install the universal joint assembly to the power steering unit assembly.
Temporary tighten the universal joint bolt.
- c Install the transfer gear assembly with the shim to frame.

Torque: 54N·m (40lb ft)

- d Tighten the universal joint bolt to the specified torque.

Torque: 31 N·m (23lb ft)

5. Install the stone guard.

6. Bleed the system.

Refer to *Bleeding the Power Steering System* in this section.

Installation (4×4 Model)

1. Install power steering unit to crossmember.
Tighten fixing bolt to specified torque.

Torque: 116N·m (85lb ft)

2. Install power steering unit with crossmember to frame by aligning the setting marks made when removing.
Tighten crossmember mounting bolt to specified torque.

Torque: 173N·m (128lb ft)

3. Install lower control arm bolt.
Refer to *Front Suspension in Suspension* section.

4. Install torsion bar.

Refer to *Front Suspension in Suspension* section.

5. Connect the feed line and return line.

Torque: 25N·m (18lb ft)

6. Install tie-rod end assembly to knuckle.

Torque: 118N·m (87lb ft)

2A-20 POWER-ASSISTED STEERING SYSTEM

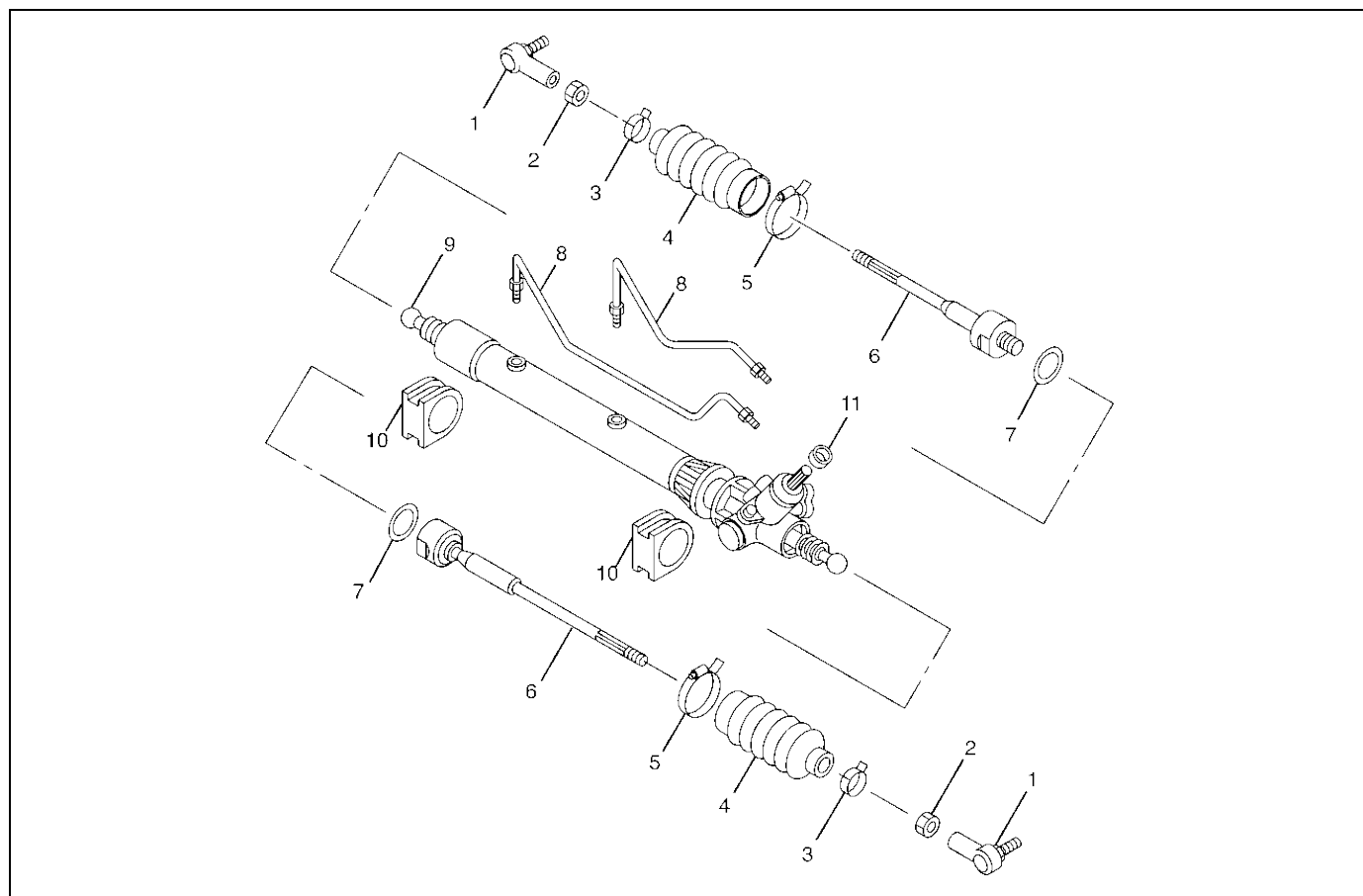
7.
 - a Align the setting marks made at removal.
Install the universal joint assembly to the transfer gear assembly.
Temporary tighten the universal joint bolt.
 - b Install the universal joint assembly to the power steering unit assembly.
Temporary tighten the universal joint bolt.
 - c Install the transfer gear assembly with the shim to frame.
8. Install the stone guard.
9. Bleed the system.
Refer to *Bleeding the Power Steering System* in this section.

Torque: 54 N·m (40 lbft)

- d Tighten the universal joint bolt to the specified torque.

Torque: 31 N·m (23 lbft)

Power Steering Unit Disassembled View



440R100002

Legend

- | | |
|-----------------|----------------------------|
| (1) Tie-rod End | (6) Tie-rod Assembly |
| (2) Lock Nut | (7) Tab Washer |
| (3) Clip | (8) Oil Line |
| (4) Bellows | (9) Valve Housing Assembly |
| (5) Band | (10) Mounting Rubber |
| | (11) Dust Cover |

Disassembly

NOTE: The valve housing is made of aluminum and care should be exercised when clamping in a vise, etc. to prevent distortion or damage.

1. Loosen lock nut and remove tie-rod end.
2. Remove clip (3) and band (5), then remove bellows (4).
3. Remove tie-rod assembly.
To remove, move the boot toward the tie-rod end, then remove tab washer.
4. Remove oil line, mounting rubber and dust cover.

Inspection and Repair

Inspect the following parts for wear, damage or any abnormal conditions.

Tie-rod End

If looseness or play is found when checked by moving the end of ball joint at tie-rod end, replace tie-rod end.

Tie-rod Assembly

If the resistance is insufficient or play is felt when checked by moving the ball on the tie-rod, replace the tie-rod assembly.

Rubber Parts

If wear or damage is found through inspection, replace with new ones.

Main Data and Specifications

General Specifications

Power Steering unit	Type	Rack and pinion
	Rack stroke	152mm (5.98in)
	Lock to lock	3.64

Reassembly

1. Install mounting rubber and dust cover (If removed).
2. Install oil line.

Torque: 13N·m (113lb in)

3. Install tie-rod assembly with tab washer.
Apply grease to ball joint, install tie-rod and tab washer, then tighten to specified torque.

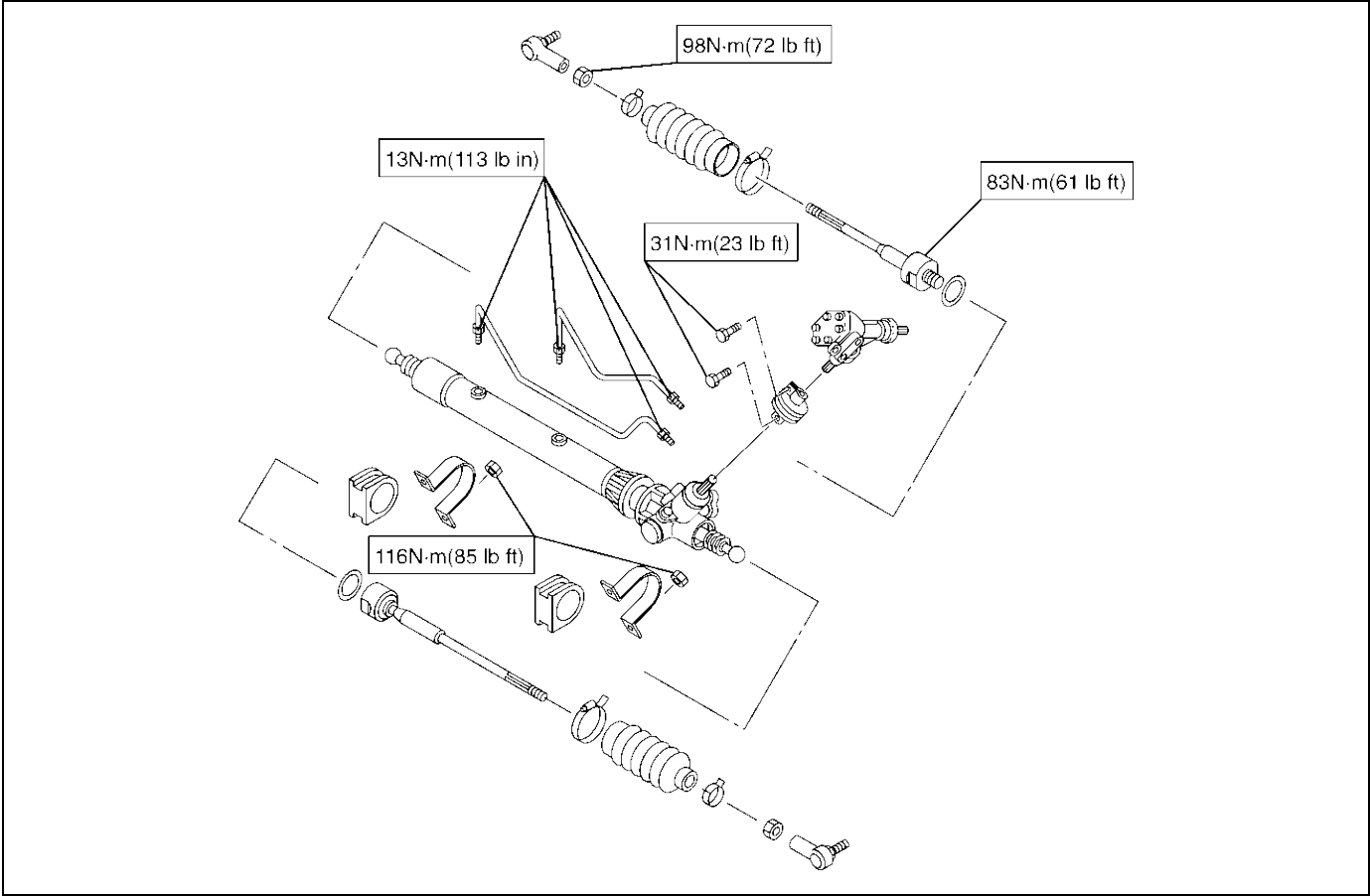
Torque: 83N·m (61 lb ft)

After tightening, bend tab washer against width across flat of inner ball joint.

4. Apply a thin coat of grease to the shaft for smooth installation. Then install bellows.
5. Install band and clip.
6. Install tie-rod end and tighten lock nut.

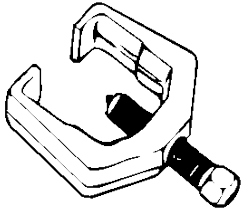
Torque: 98N·m (72lb ft)

Torque Specifications



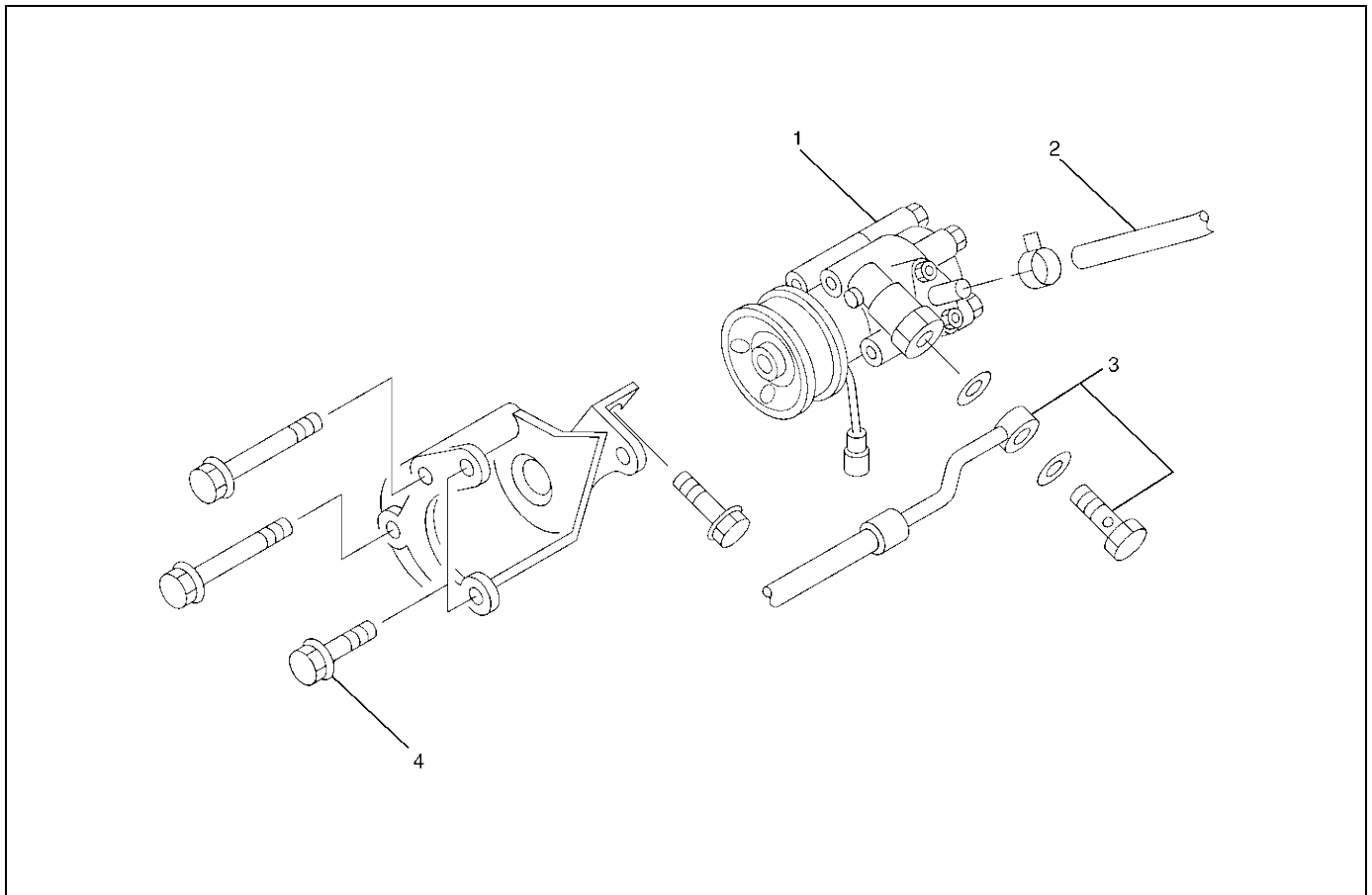
440R100003

Special Tools

ILLUSTRATION	TOOL NO. TOOL NAME
 901R5279	J-29107 Tie rod end remover

Power Steering Pump

Power Steering Pump and Associated Parts



Legend

- (1) Pump Assembly
- (2) Hose, Suction

- (3) Hose, Flexible
- (4) Bolt

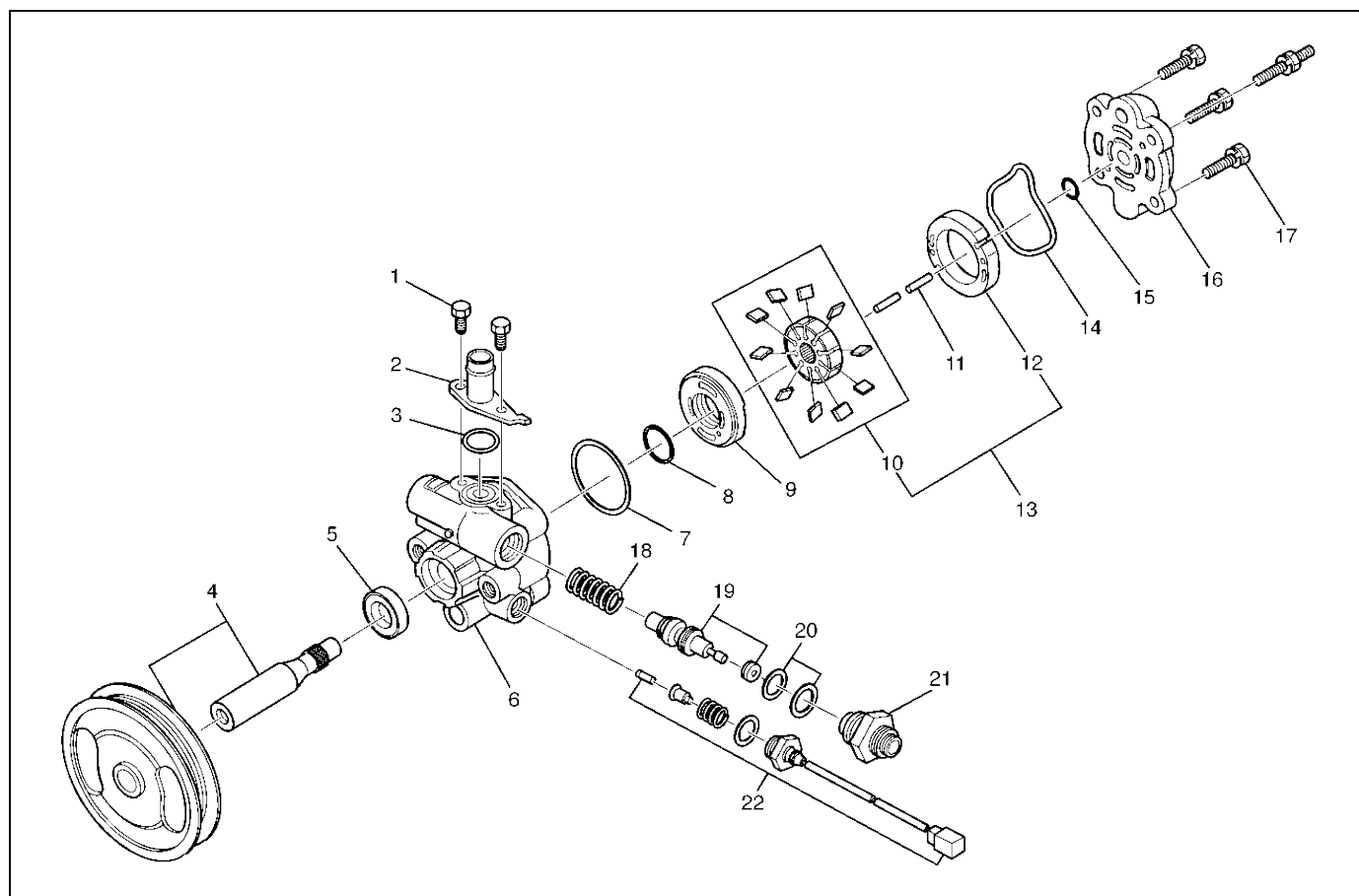
Removal

1. Remove the drive belt.
2. Place a drain pan below the pump.
3. Disconnect the suction hose.
4. Disconnect the flexible hose.
5. Remove the power steering fixing bolt and remove the pump assembly.

Installation

1. Install the pump assembly to the pump bracket, tighten the fixing bolt to the specified torque.
Torque: 46 N·m (34 lb ft)
2. Install the flexible hose.
Tighten the eye bolt to specified torque.
Torque: 54 N·m (40 lb ft)
3. Install the drive belt.
4. Connect the suction hose, then fill and bleed system.
Refer to *Bleeding the Power Steering System* in this section.

Power Steering Pump Disassembled View



Legend

- | | |
|---------------------|-------------------------------|
| (1) Bolt | (12) Cam |
| (2) Suction Pipe | (13) Pump Cartridge Assembly |
| (3) O-ring | (14) O-ring |
| (4) Shaft Assembly | (15) Snap Ring |
| (5) Oil Seal | (16) Rear Housing |
| (6) Front Housing | (17) Bolt |
| (7) O-ring | (18) Spring |
| (8) O-ring | (19) Relief Valve |
| (9) Side Plate | (20) O-ring |
| (10) Rotor and Vane | (21) Connector |
| (11) Pin | (22) Pressure Switch Assembly |

Disassembly

1. Clean the oil pump with solvent (plug the discharge and suction ports to prevent the entry of solvent). Be careful not to expose the oil seal of shaft assembly to solvent.
2. Remove the bolt, suction pipe and O-ring.
3. Remove the connector, O-ring, relief valve and spring.
4. Remove the pressure switch assembly.

5. Remove the bolt, rear housing and O-ring.
6. Remove the snap ring.
7. Remove the shaft assembly.
8. Remove the oil seal.

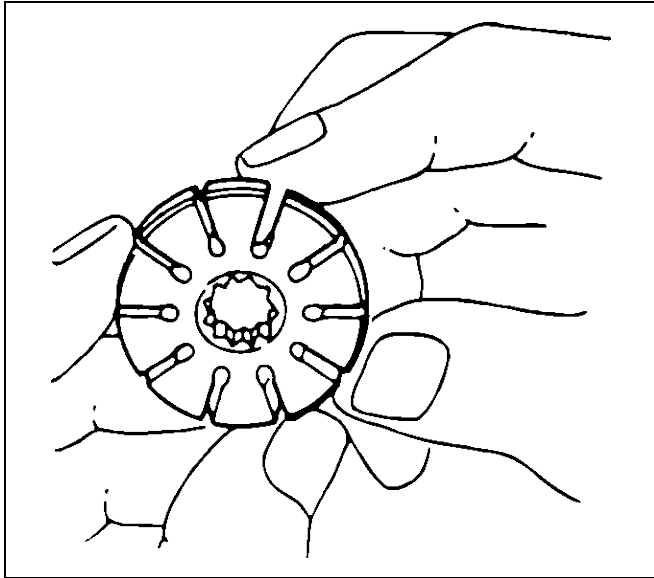
CAUTION: When removing the oil seal, be careful not to damage the housing.

9. Remove the pump cartridge assembly from the front housing.
10. Remove two O-rings.

Inspection and Repair

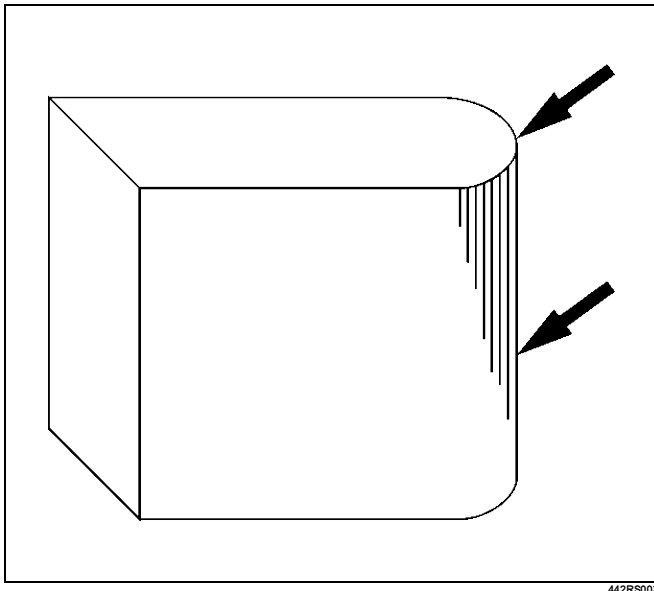
Make all necessary adjustments, repairs, and part replacements if wear, damage, or other problems are discovered during inspection.

Rotor



Check that the groove in the vane is free from excessive wear and that the vane slides smoothly. When part replacement becomes necessary, the pump cartridge should be replaced as a subassembly.

Vane



Sliding faces of the vane should be free from wear. (Particularly the curved face at the tip that contact with the cam should be free from wear and distortion). When part replacement becomes necessary, the pump cartridge should be replaced as a subassembly.

Cam

The inner face of the arm should have a uniform contact pattern without a sign of step wear. When part replacement becomes necessary, the pump cartridge should be replaced as a subassembly.

Side Plate

The sliding faces of parts must be free from step wear (more than 0.01 mm), which can be felt by the finger nail.

The parts with minor scores may be reused after lapping the face.

Relief Valve

The sliding face of the valve must be free from burrs and damage. The parts with minor scores may be reused after smoothing with emery cloth (#800 or finer).

Shaft

Oil seal sliding faces must be free from a step wear which can be felt by the finger nail. Bushing fitting face must be free from damage and wear.

O-ring, Oil Seal, Snap Ring

Be sure to discard used parts, and always use new parts for installation. Prior to installation, lubricate all seals and rings with power steering fluid.

Pressure Switch

Check the switch operation as follows:

With engine idling and A/C on, turn the steering wheel fully to the left; compressor should interrupt and engine idle speed will increase. Shut off A/C and again turn steering fully to the left; engine idle will increase. If system fails to function properly, disconnect connector at the pressure switch and repeat system check while testing continuity across disconnected SW connector.

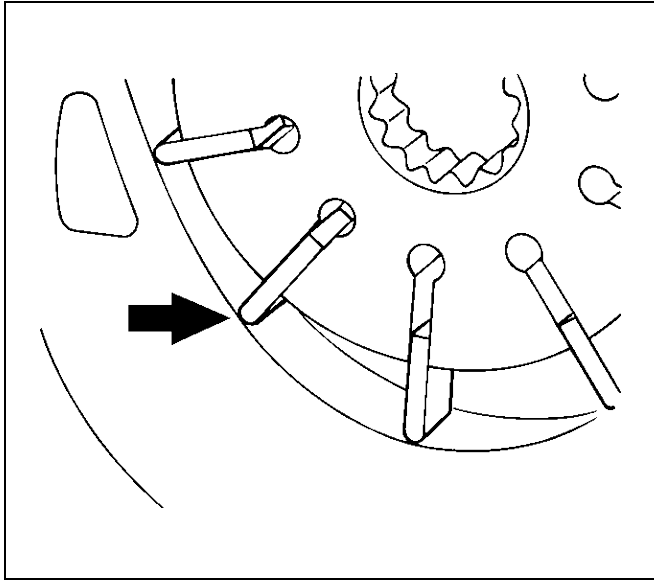
Reassembly

1. Install oil seal to front housing. Be sure to discard used oil seal, and always use new parts for installation.

CAUTION: When installing the oil seal, be careful not to damage the oil seal contacting surface of the housing.

2. Install shaft assembly.

3. Install the vanes to rotor with curved face in contact with the inner wall of cam.



4. Install rotor and vanes to cam.
5. Install pin to front housing.
6. Install two new O-rings to front housing. Be sure to discard used O-ring.
7. Install side plate.

CAUTION: When installing side plate, be careful not to damage its inner surface. Damaged side plate may cause poor pump performance, pump seizure or oil leakage.

8. Install pump cartridge assembly to front housing.
9. Install snap ring to shaft end.
10. Install rear housing with a new O-ring. Be sure to discard used O-ring. Then install bolt and tighten it to specified torque.

Torque: 24 N·m (17 lbft)

11. Install suction pipe with a new O-ring. Be sure to discard used O-ring. Then install bolt and tighten it to specified torque.

Torque: 10 N·m (87 lbin)

12. Install relief valve and spring.
13. Install connector with a new O-ring. Be sure to discard used O-ring. Tighten the connector to specified torque.

Torque: 59 N·m (43 lbft)

14. Install pressure switch assembly and tighten it to specified torque.

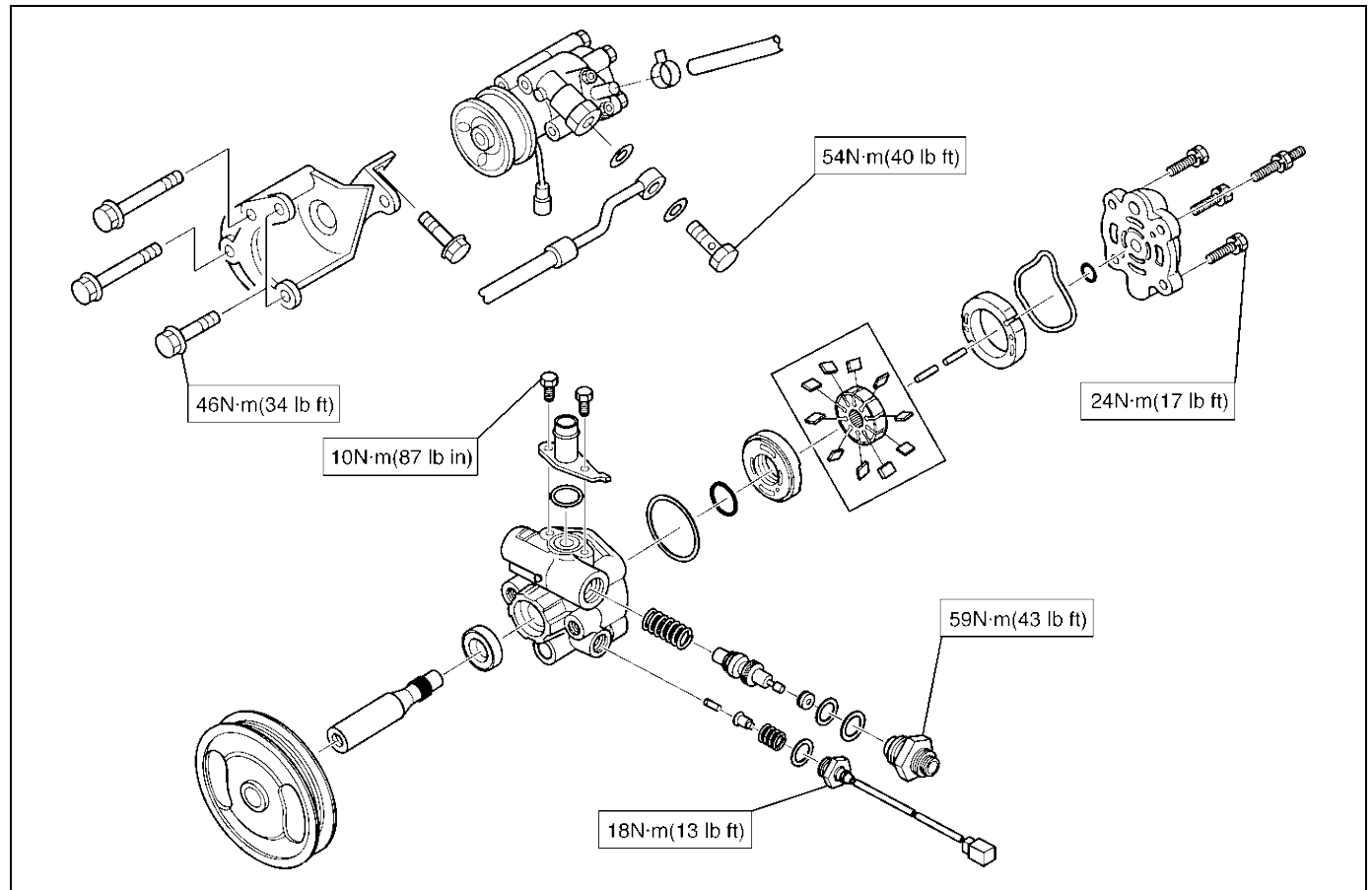
Torque: 18 N·m (13 lbft)

Main Data and Specifications

General Specifications

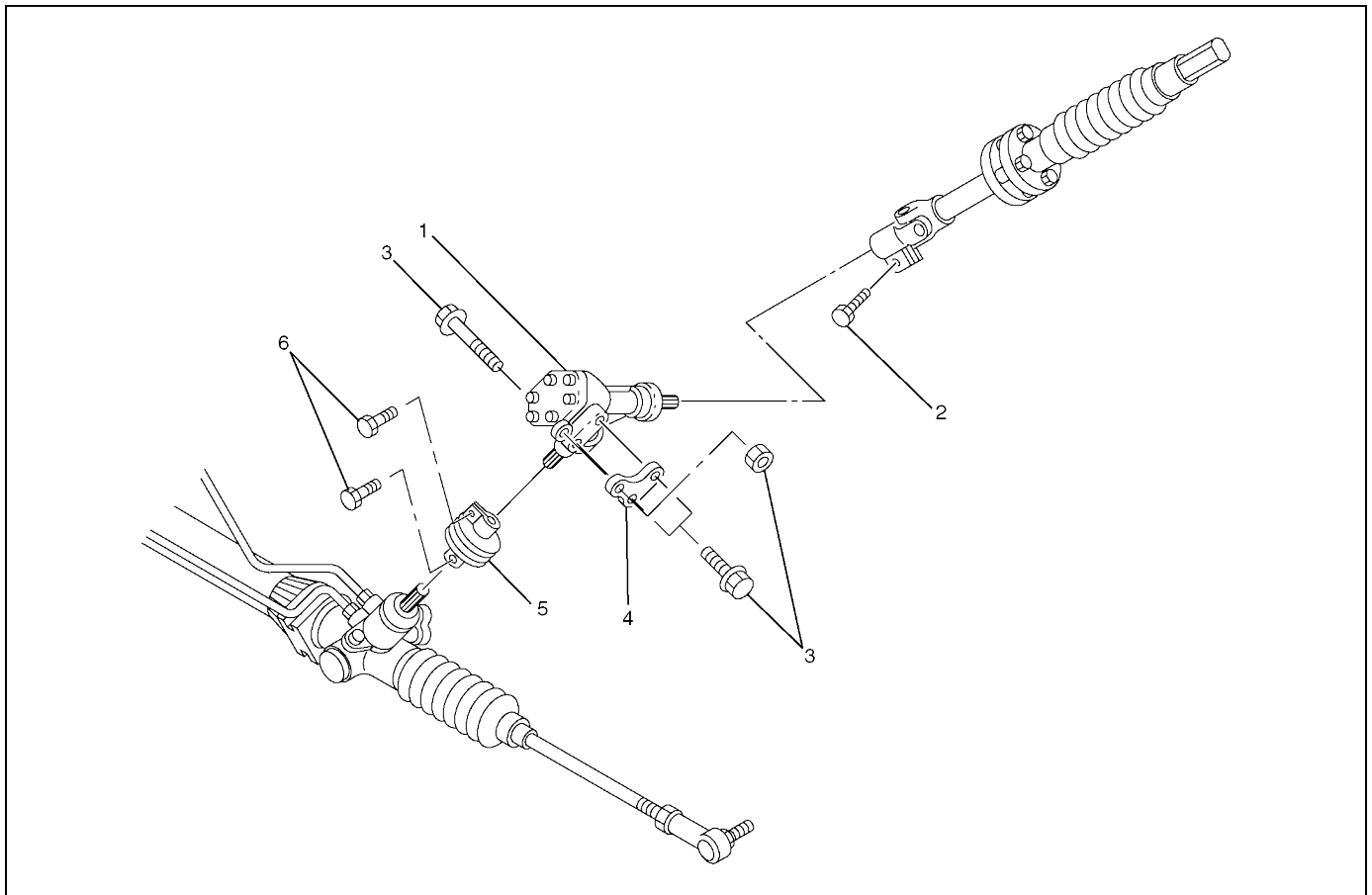
Oil pump	Type	Vane
	Operating fluid	ATF DEXRON®-III

Torque Specifications



Transfer Gear Assembly

Transfer Gear Assembly and Associated Parts



441R200001

Legend

- | | |
|---|--|
| (1) Transfer Gear Assembly | (4) Shim |
| (2) Bolt, Universal Joint (Steering Shaft Side) | (5) Universal Joint Assembly |
| (3) Fixing Bolt Nut | (6) Bolt, Universal Joint (Steering Unit Side) |

Removal

1. Apply a setting mark across the universal joint (steering shaft side) and transfer gear assembly to reassemble the parts in their original position.
2. Remove universal joint bolt (steering shaft side).
3. Apply a setting mark across the universal joint assembly and the transfer gear assembly to reassemble the parts in their original position.
4. Remove universal joint bolts (both of transfer gear assembly side and power steering unit assembly side).
5. Loosen fixing bolts and nut and remove transfer gear assembly with shim.

Inspection and Repair

The transfer gear assembly cannot be disassembled. If damage or abnormal condition are found, replace the entire transfer gear assembly.

Installation

1. Install the transfer gear assembly to the universal joint (steering shaft side) align the setting marks made at removal.
Then tighten the universal joint bolt.
2. Install the universal joint assembly to the power steering unit assembly align the setting marks made at removal.
Then temporary tighten the universal joint bolt (both of transfer gear assembly side and power steering unit assembly side).
3. Install the transfer gear assembly with the shim to frame.
Torque: 54 N·m (40 lb ft)
4. Tighten the universal joint bolts to the specified torque.
Torque: 31 N·m (23 lb ft)

Supplemental Restraint System Steering Wheel & Column

Service Precaution

This steering wheel and column repair section covers the Supplemental Restraint System (SRS) steering column. The following repair procedures are specific to SRS components. When servicing a vehicle equipped with Supplemental Restraint System, pay close attention to all WARNINGS and CAUTIONS. For detailed explanation about SRS, refer to *Restraints* section.

WARNING: THIS VEHICLE HAS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS). REFER TO *THE SRS COMPONENT AND WIRING LOCATION VIEW* IN ORDER TO DETERMINE WHETHER YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING. WHEN YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING, REFER TO *THE SRS SERVICE INFORMATION*. FAILURE TO FOLLOW WARNINGS COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY, OR OTHERWISE UNNEEDED SRS SYSTEM REPAIRS. SAFE HANDLING OF INFLATOR MODULES REQUIRES FOLLOWING THE PROCEDURES DESCRIBED BELOW FOR BOTH LIVE AND DEPLOYED MODULES.

SAFETY PRECAUTIONS MUST BE FOLLOWED WHEN HANDLING A DEPLOYED AIR BAG ASSEMBLY (AIR BAG). AFTER DEPLOYMENT, THE AIR BAG ASSEMBLY (AIR BAG) SURFACE MAY CONTAIN A SMALL AMOUNT OF SODIUM HYDROXIDE, A BY-PRODUCT OF THE DEPLOYMENT REACTION, THAT IS IRRITATING TO THE SKIN AND EYES. MOST OF THE POWDER ON THE AIR BAG ASSEMBLY (AIR BAG) IS HARMLESS. AS A PRECAUTION, WEAR GLOVES AND SAFETY GLASSES WHEN HANDLING A DEPLOYED AIR BAG ASSEMBLY, AND WASH YOUR HANDS WITH MILD SOAP AND WATER AFTERWARDS.

WHEN CARRYING A LIVE AIR BAG ASSEMBLY, MAKE SURE THE BAG AND TRIM COVER ARE POINTED AWAY FROM YOU. NEVER CARRY AN AIR BAG ASSEMBLY BY THE WIRES OR CONNECTOR ON THE UNDERSIDE OF MODULE. IN THE CASE OF AN ACCIDENTAL DEPLOYMENT, THE BAG WILL THEN DEPLOY WITH MINIMAL CHANCE OF INJURY. WHEN PLACING A LIVE AIR BAG ASSEMBLY ON A BENCH OR OTHER SURFACE, ALWAYS FACE THE BAG AND TRIM COVER UP, AWAY FROM THE SURFACE.

NEVER REST A STEERING COLUMN ASSEMBLY ON THE STEERING WHEEL WITH THE AIR BAG ASSEMBLY FACE DOWN AND COLUMN VERTICAL. THIS IS NECESSARY SO THAT A FREE SPACE IS PROVIDED TO ALLOW THE AIR BAG ASSEMBLY TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY COULD RESULT. TO AVOID DEPLOYMENT WHEN TROUBLESHOOTING THE SRS SYSTEM, DO NOT USE ELECTRICAL TEST EQUIPMENT, SUCH AS BATTERY-POWERED OR A/C-POWERED VOLT-METER, OHMMETER, ETC., OR ANY TYPE OF ELECTRICAL EQUIPMENT OTHER THAN SPECIFIED IN THIS MANUAL. DO NOT USE A NON-POWERED PROBE-TYPE TESTER. INSTRUCTIONS IN THIS MANUAL MUST BE FOLLOWED CAREFULLY, OTHERWISE PERSONAL INJURY MAY RESULT.

SRS Connectors

CAUTION: The special yellow color connectors are used for supplemental restraint system-air bag circuit.

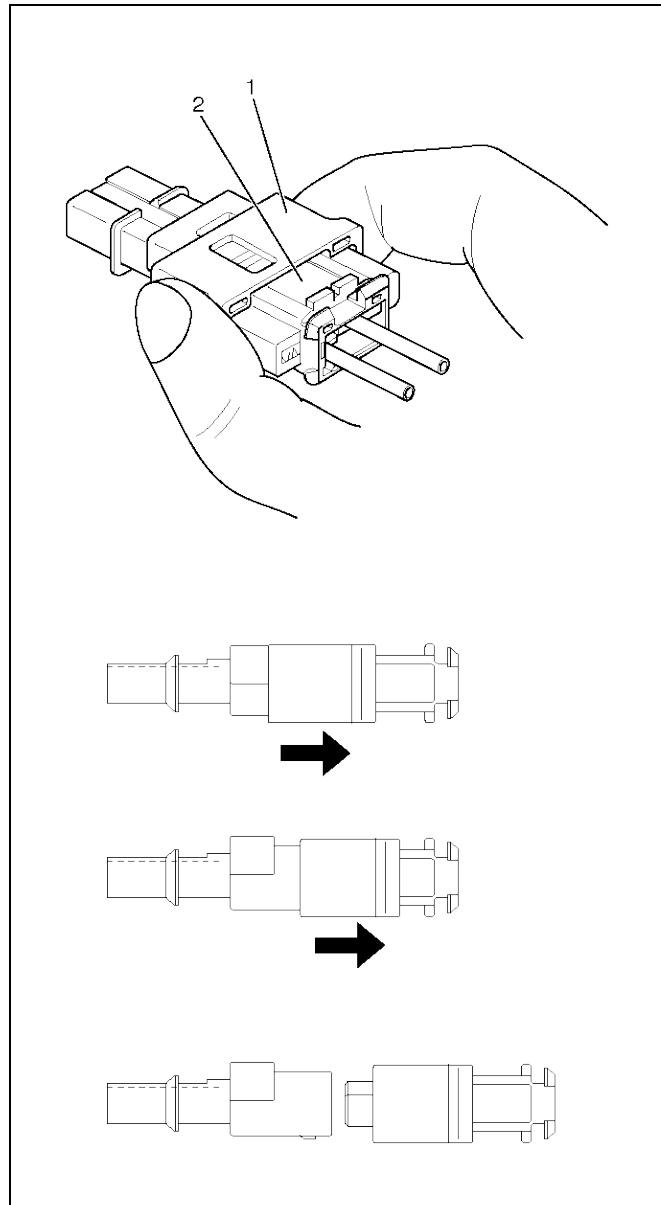
When removing the cable harness disconnect the connector by unlocking at two places, outside (1) and inside (2). Do not pull the wires or disconnection may occur.

When connecting the double lock type SRS connector, insert the connector completely then lock the connector. Imperfect locking may cause the SRS circuit to malfunction.

Removal

To remove the connector, hold the cover insulator(1) and pull it. The cover insulator slides and lock will be released.

Do not hold the socket insulator(2).

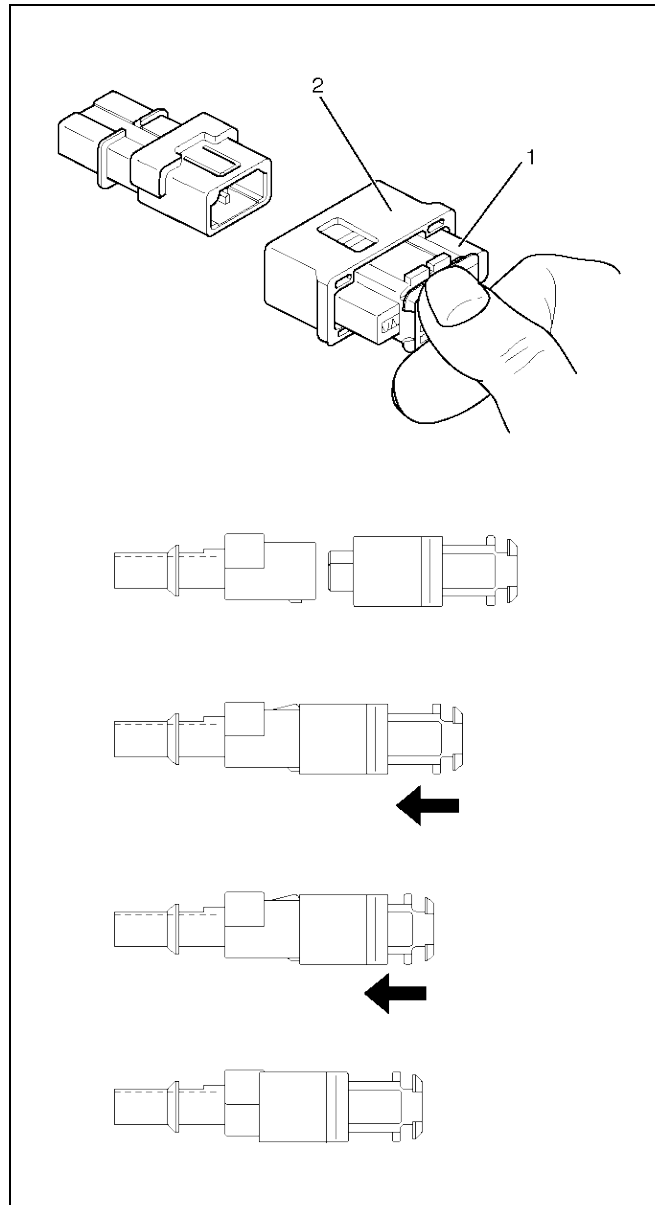


827RW028

Installation

To install the connector, hold the socket insulator(1) and insert it. The cover insulator slides and connector will be locked.

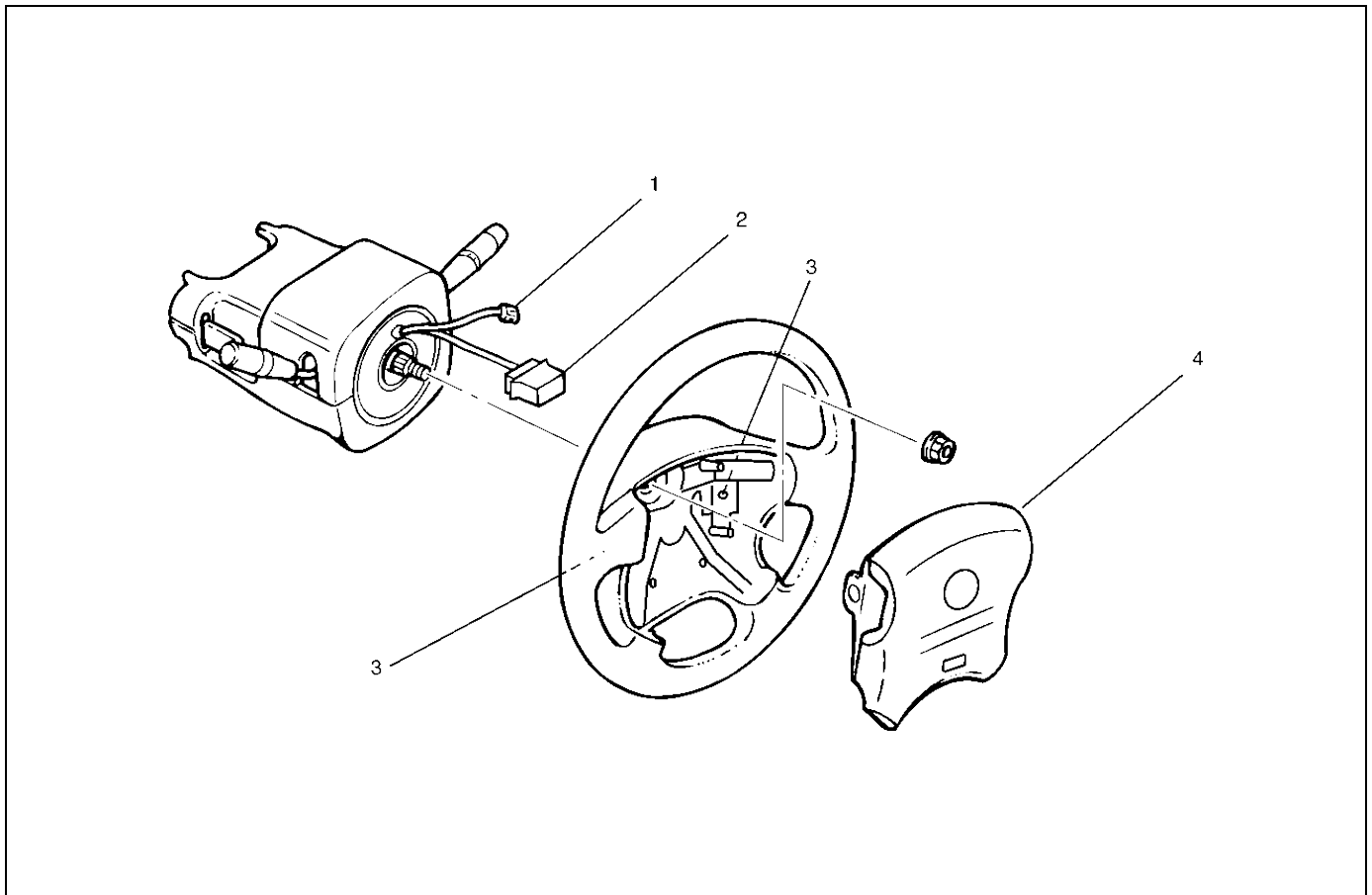
Do not hold the cover insulator(2).



827RW027

Inflator Module

Inflator Module and Associated Parts



827RW071

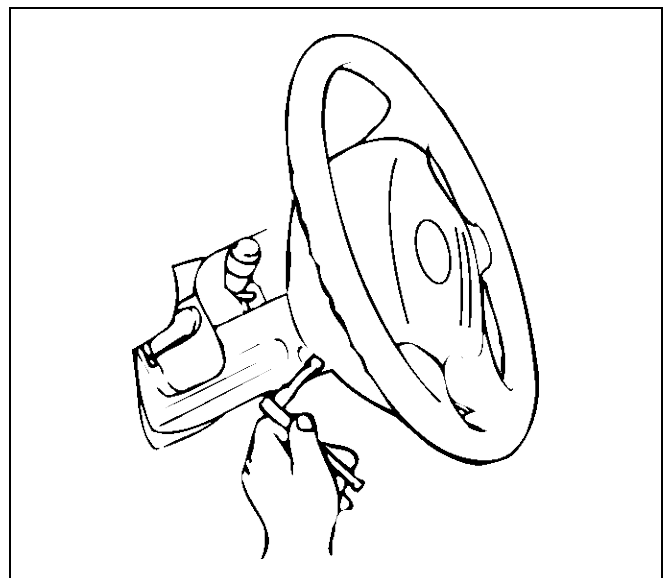
Legend

- (1) Horn Lead
- (2) SRS Connector

- (3) Fixing Bolt
- (4) Inflator Module

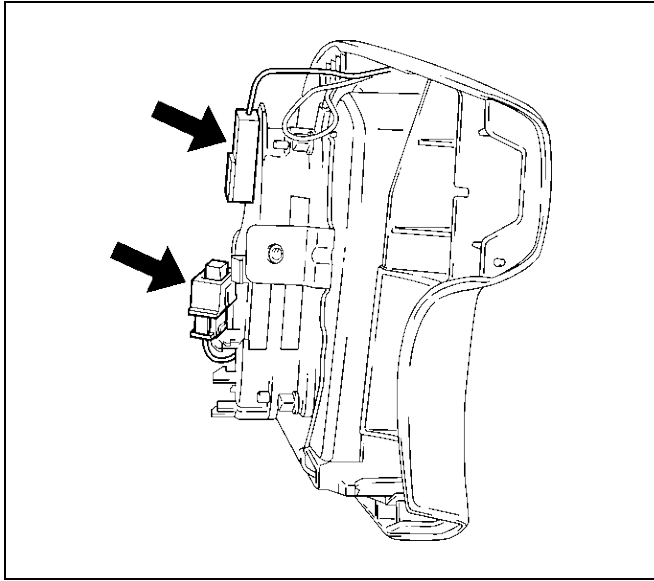
Removal

1. Turn the steering wheel so that the vehicle's wheels are pointing straight ahead.
2. Turn the ignition switch to "LOCK".
3. Disconnect the battery "-" terminal cable, and wait at least 5 minutes.
4. Disconnect the yellow 2-way SRS connector located under the steering column.
5. Loosen the inflator module fixing bolt from behind the steering wheel assembly using a TORX® driver or equivalent until the inflator module can be released from steering assembly .



827RW070

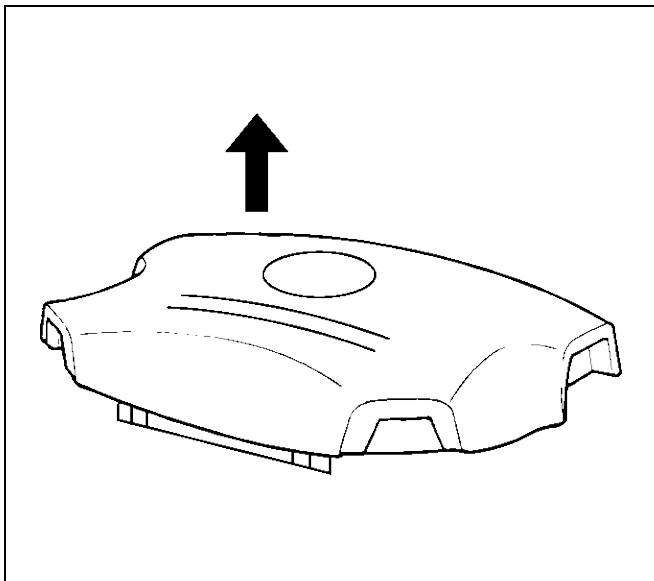
6. Disconnect the yellow 2-way SRS connector and horn lead located behind the inflator module.



7. Remove inflator module.

Inspection and Repair

WARNING: THE INFLATOR MODULE SHOULD ALWAYS BE CARRIED WITH THE TRIM COVER AWAY FROM YOUR BODY AND SHOULD ALWAYS BE LAID ON A FLAT SURFACE WITH THE URETHANE SIDE UP. THIS IS NECESSARY BECAUSE FREE SPACE IS PROVIDED TO ALLOW THE AIR CUSHION TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY MAY RESULT .



The inflator module consists of a cover, air bag, inflator, and retainer. Inspect the inflator module mainly for the following:

- Check for holes, cracks, severe blemishes and deformation on the cover.
- Check that the retainer is not deformed.
- Check for defects such as damage and breakage in the lead wire for the igniter.

Replace the inflator module if a defect is found during inspection.

Installation

1. Install inflator module.
2. Support the module and carefully connect the module connector and horn lead.

NOTE: Pass the lead wire through the tabs on the plastic cover (wire protector) of inflator to prevent lead wire from being pinched.

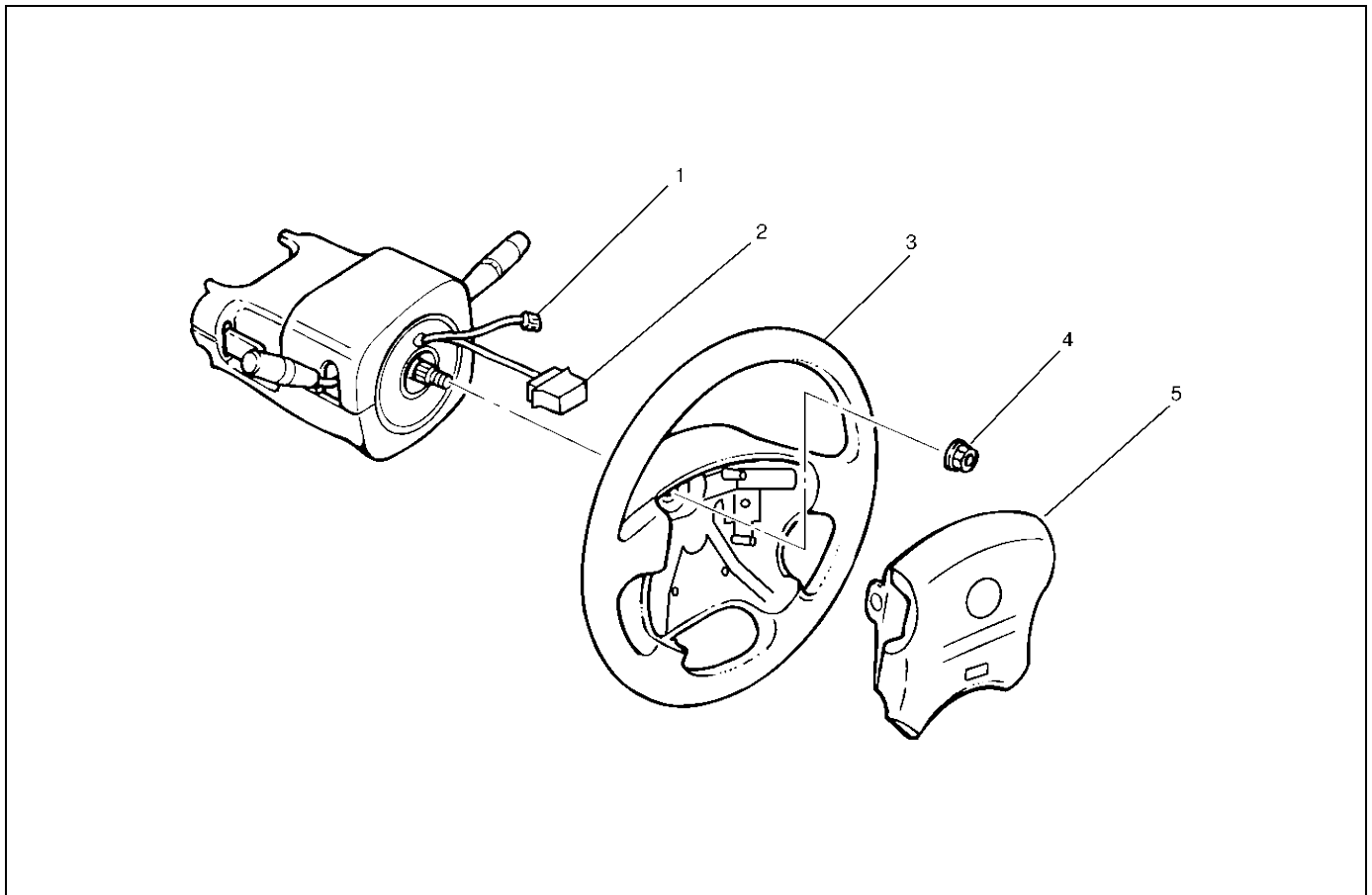
3. Tighten bolts to specified torque.

Torque: 9N·m (78lbin)

4. Connect the yellow 2-way SRS connector located under the steering column.
5. Connect the battery “-” terminal cable.
6. Set ignition to “ON” while watching warning light. Light should flash 7 times and then go off. If lamp does not operate correctly, refer to *Restraints* section.

Steering Wheel

Steering Wheel and Associated Parts



827RW069

Legend

- (1) Horn Lead
- (2) SRS Connector

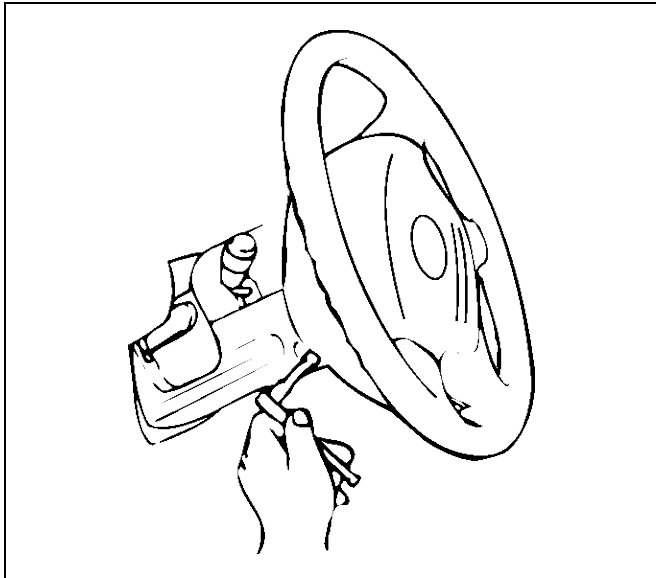
- (3) Steering Wheel
- (4) Steering Wheel Fixing Nut
- (5) Inflator Module

CAUTION: Once the steering column is removed from the vehicle, the column is extremely susceptible to damage. Dropping the column assembly on its end could collapse the steering shaft or loosen the slide block which maintains column rigidity. Leaning on the column assembly could cause the jacket to bend or deform. Any of the above damage could impair the column's collapsible design. If it is necessary to remove the steering wheel, use only the specified steering wheel puller. Under no conditions should the end of the shaft be hammered upon, as hammering could loosen the slide block which maintains column rigidity.

Removal

1. Turn the steering wheel so that the vehicle's wheels are pointing straight ahead.
2. Turn the ignition switch to "LOCK".
3. Disconnect the battery ground cable, and wait at least 5 minutes.
4. Disconnect the yellow 2-way SRS connector located under the steering column.

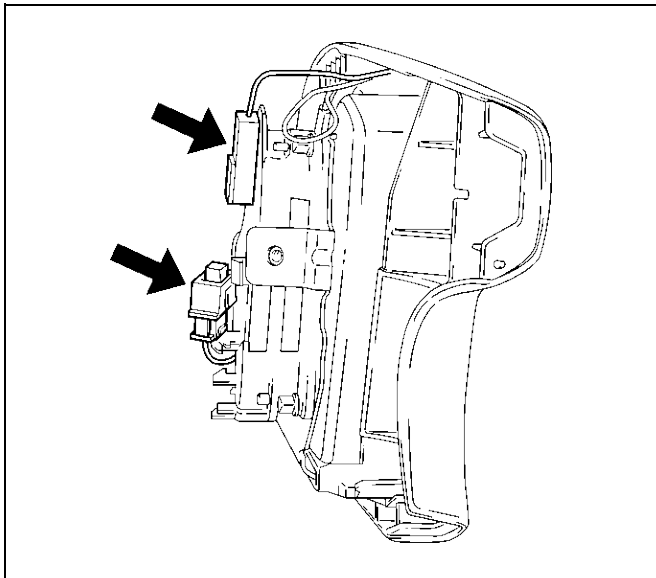
5. Loosen the inflator module fixing bolt from behind the steering wheel assembly using a TORX® driver or equivalent until the inflator module can be released from steering assembly.



827 RW070

6. Disconnect the yellow 2-way SRS connector located behind the inflator module.

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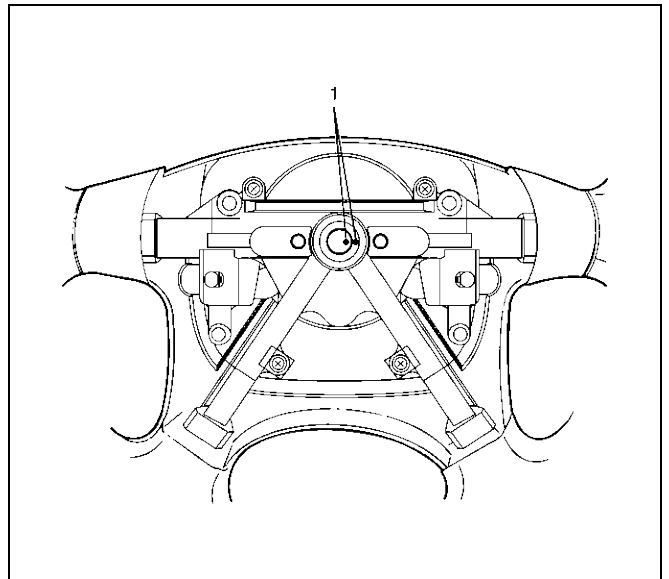


827 RW073

7. Disconnect horn lead.

8. Remove steering wheel fixing nut.

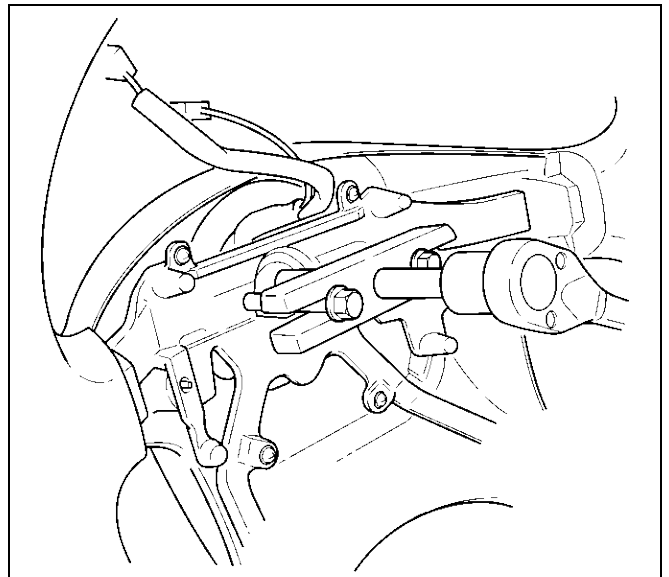
9. Apply a setting mark (1) across the steering wheel and shaft so parts can be reassembled in their original position, then remove steering wheel.



430RW021

10. Move the front wheels to the straight ahead position, then use steering wheel remover J-29752 to remove the steering wheel.

CAUTION: Never apply force to the steering wheel shaft using a hammer or other impact tools in an attempt to remove the steering wheel. The steering shaft is designed as an energy absorbing unit.



430RX006

Installation

1. Install steering wheel by aligning the setting marks made when removing.

CAUTION: Never apply force to the steering wheel shaft using a hammer or other impact tools in an attempt to remove the steering wheel. The steering shaft is designed as an energy absorbing unit.

2. Tighten the steering wheel fixing nut to the specified torque.

Torque: 34 N·m (25 lbft)

3. Connect horn lead.
4. Support the module and carefully connect the SRS connector.

NOTE: Pass the lead wire through the tabs on the plastic cover (wire protector) of inflator to prevent lead wire from being pinched.

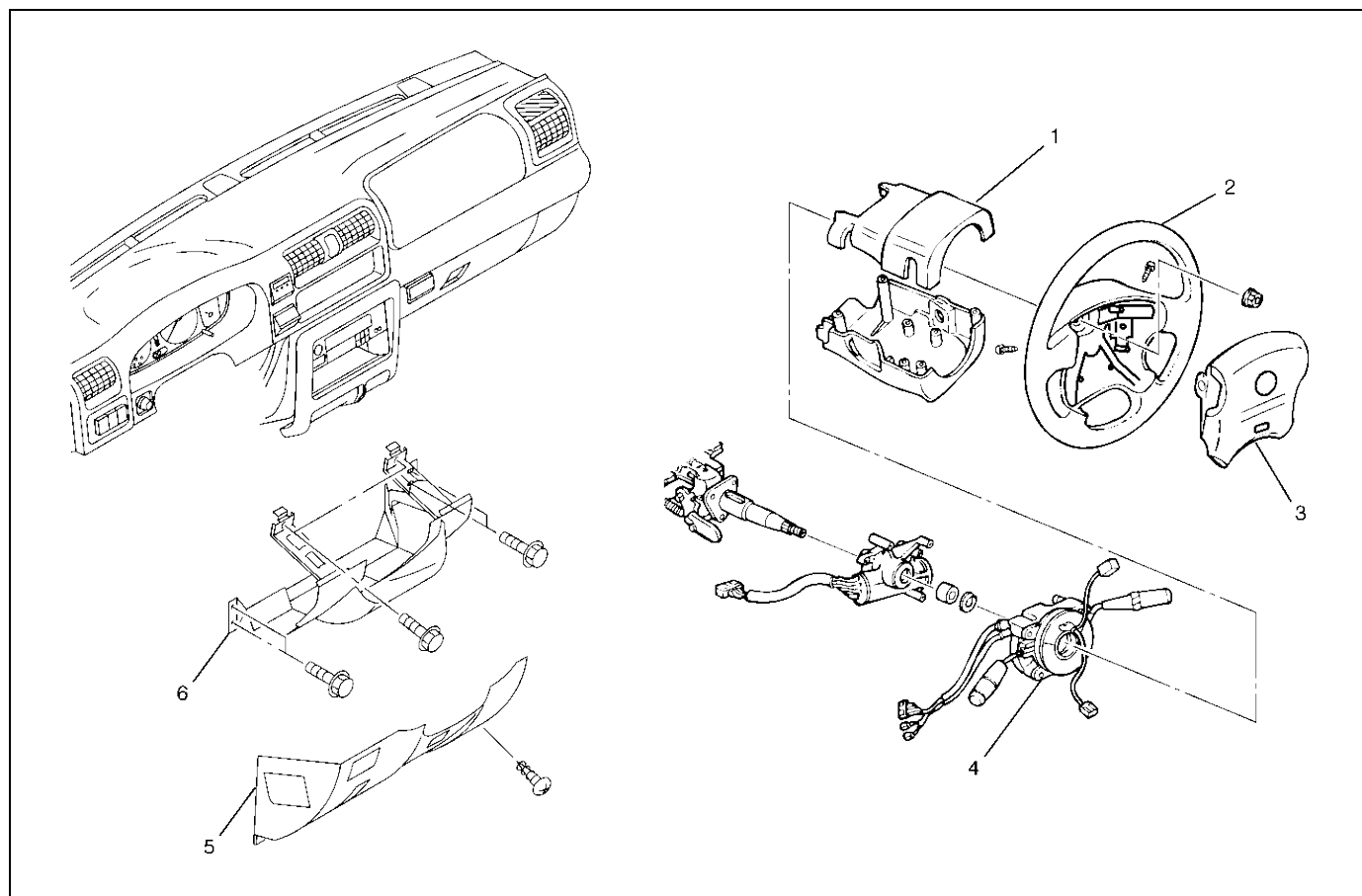
5. Tighten bolts to specified torque.

Torque: 9 N·m (78 lb in)

6. Connect the yellow 2-way SRS connector located under the steering column.
7. Connect the battery “-” terminal cable.
8. Turn the ignition switch to the “ON” position and observe the warning lamp. The lamp should flash 7 times. If the lamp does not operate correctly, refer to *Restraints* section.

Combination Switch

Combination Switch and Associated Parts



Legend

- (1) Steering Column Cover
- (2) Steering Wheel
- (3) Inflator Module

- (4) Combination Switch and SRS Coil Assembly
- (5) Instrument Panel Lower Cover
- (6) Driver Knee Bolster (reinforcement)

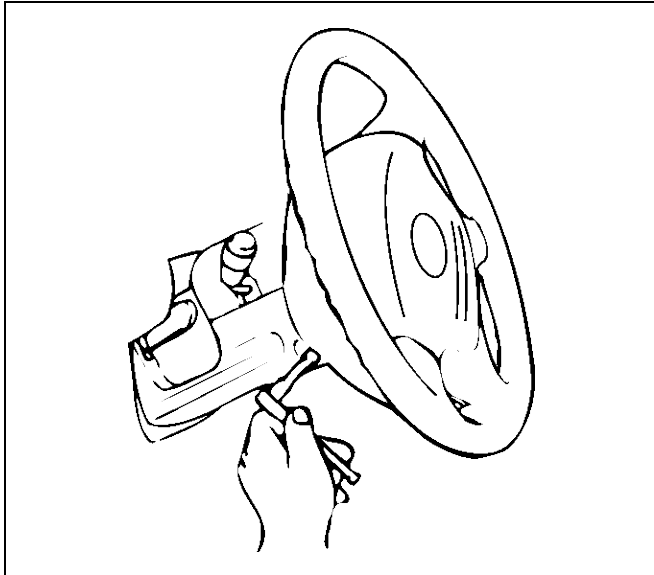
Removal

1. Turn the steering wheel so that the vehicle's wheels are pointing straight ahead.
2. Turn the ignition switch to "LOCK".
3. Disconnect the battery ground cable, and wait at least 5 minutes.
4. Disconnect the yellow 2-way SRS connector located under the steering column.

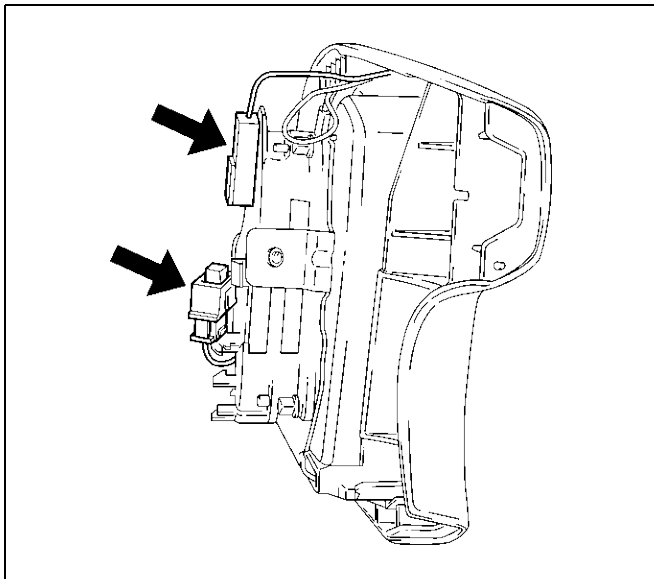
CAUTION: The wheels of the vehicle must be straight ahead and the steering column in the "LOCK" position before disconnecting the steering wheel. Failure to do so will cause the coil assembly to become uncentered which will cause damage to the coil assembly.

5. Remove the engine hood opening lever, then remove instrument panel lower cover.
6. Remove the driver knee bolster (reinforcement).

7. Loosen the inflator module fixing bolt from behind the steering wheel assembly using a TORX® driver or equivalent until the inflator module can be released from steering assembly. Disconnect the yellow 2-way SRS connector and horn lead located behind the inflator module, then remove inflator module.

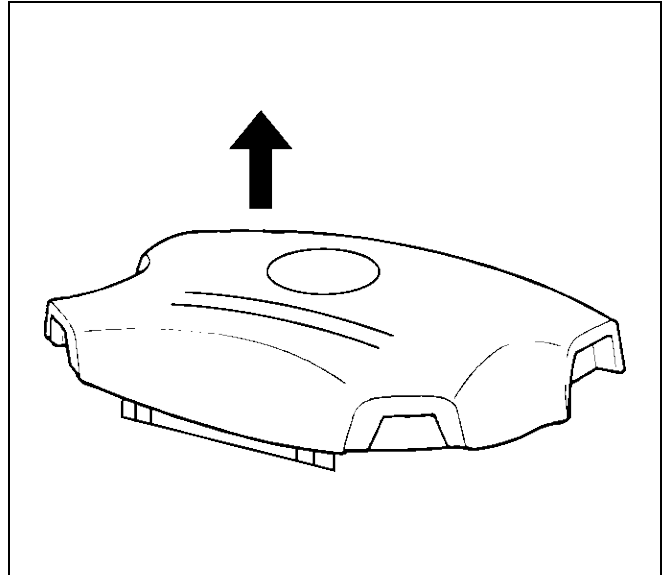


827 RW070



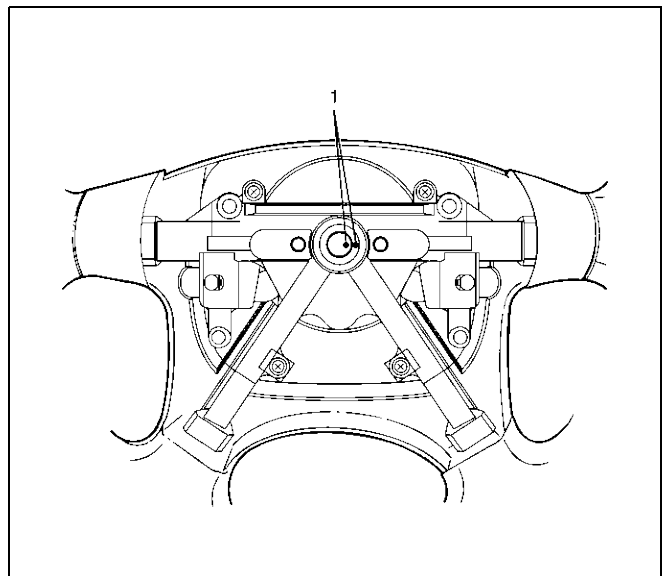
827 RW073

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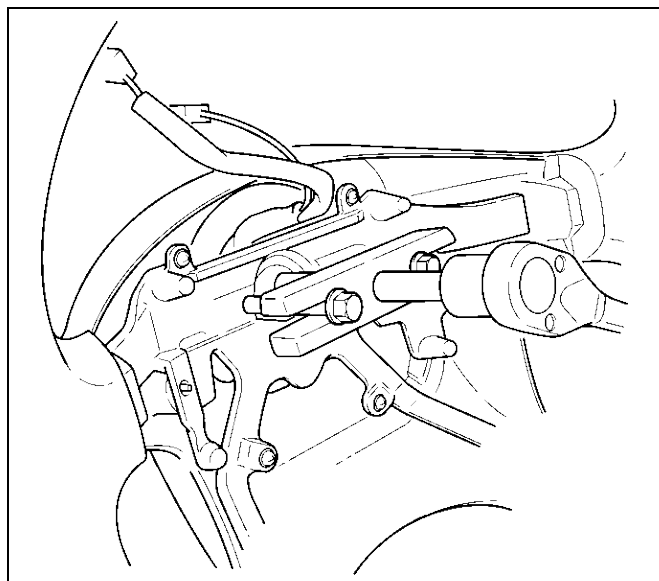
827 RW072

8. Apply a setting mark (1) across the steering wheel and shaft so parts can be reassembled in their original position. Move the front wheels to the straight ahead position, then use steering wheel remover J-29752 to remove the steering wheel.



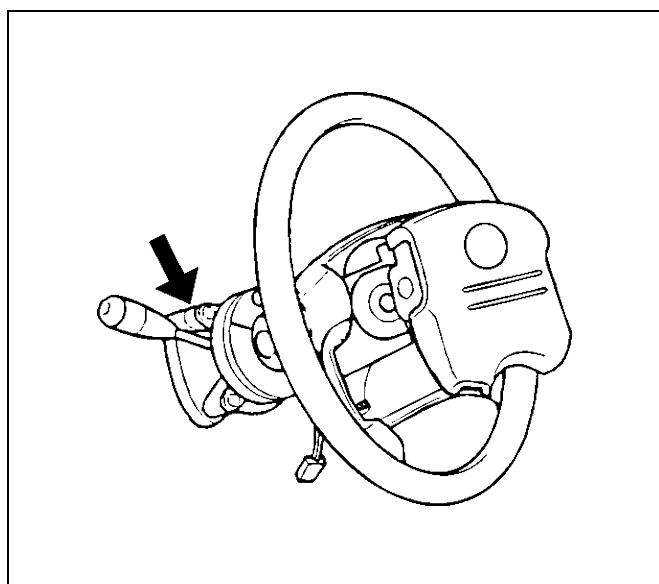
430RW021

CAUTION: Never apply force to the steering wheel shaft using a hammer or other impact tools in an attempt to remove the steering wheel. The steering shaft is designed as an energy absorbing unit.



430RX006

9. Remove steering column cover.
10. Disconnect the wiring harness connectors located under the steering column then remove combination switch and SRS coil assembly.

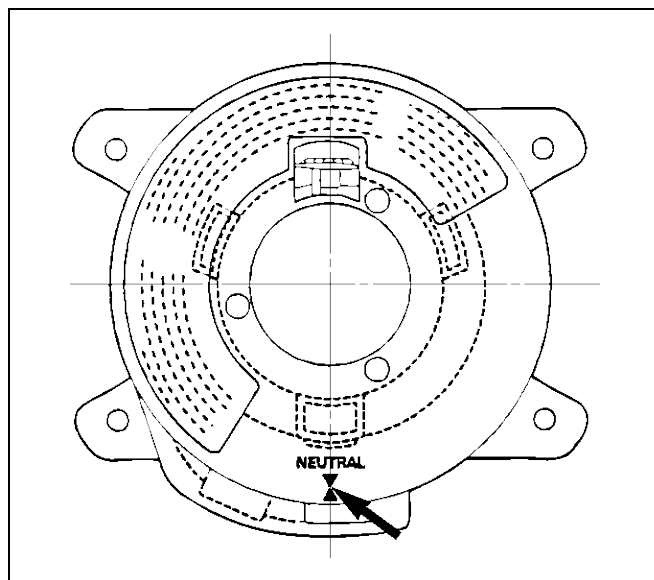


825 RW288

Installation

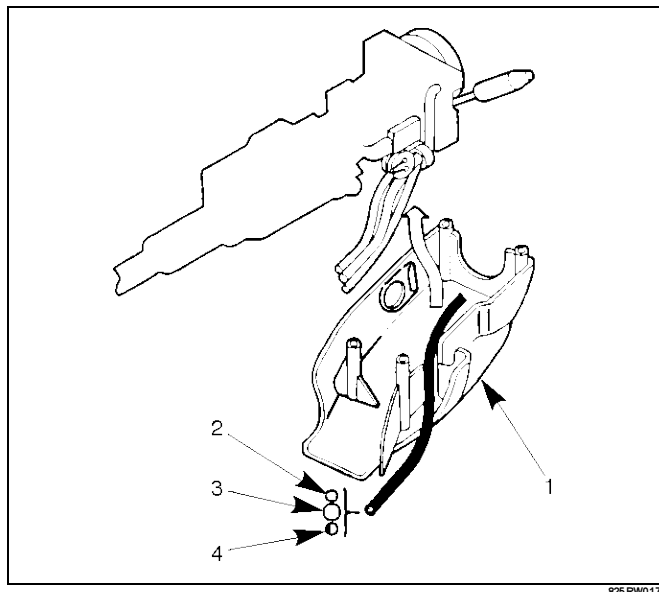
1. Install combination switch and SRS coil assembly. After installation of combination switch assembly, connect the combination switch wiring harness connector and the SRS 2-way connector located under the steering column. Then turn the SRS coil counter clockwise to full, return about 3 turns and align the neutral mark.

CAUTION: Turn the SRS coil counter clockwise until some resistance is felt, or damage may occur to the SRS coil.



825RW016

2. When installing the steering column cover, be sure to route each wire harness as illustrated so that the harnesses do not catch on any moving parts.

**Legend**

- (1) Steering Column Cover
- (2) Starter Switch Harness
- (3) Combination Switch Harness
- (4) Inflator Module Harness

3. Align the setting marks made when removing then install steering wheel.

CAUTION: Never apply force to the steering wheel shaft using a hammer or other impact tools in an attempt to remove the steering wheel. The steering shaft is designed as an energy absorbing unit.

4. Tighten the steering wheel fixing nut to the specified torque.

Torque: 34 N·m (25 lbft)

5. Support the inflator module and carefully connect the SRS connector and horn lead.

NOTE: Pass the lead wire through the tabs on the plastic cover (wire protector) of inflator to prevent lead wire from being pinched.

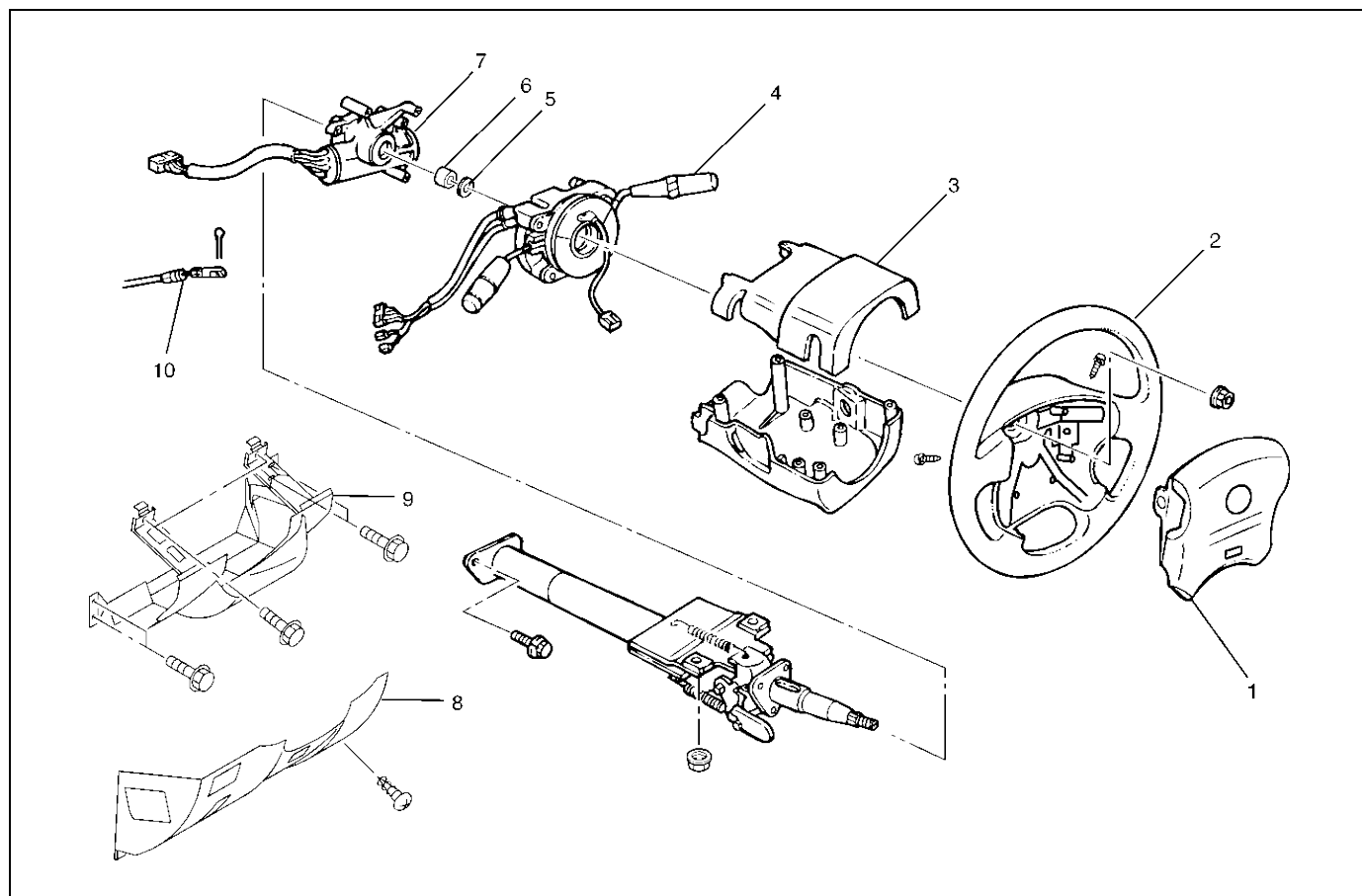
6. Tighten bolts to specified torque.

Torque: 9 N·m (78 lb in)

7. Install driver knee bolster (reinforcement).
8. Install instrument panel lower cover then Install the engine hood opening lever.
9. Connect the SRS connector.
10. Connect the battery "-" terminal cable.
11. Turn the ignition switch to the "ON" position and observe the warning lamp. The lamp should flash 7 times. If the lamp does not operate correctly, refer to *Restraints* section.

Lock Cylinder

Lock Cylinder and Associated Parts



431RX006

Legend

- | | |
|--|---|
| (1) Inflator Module | (6) Cushion Rubber |
| (2) Steering Wheel | (7) Lock Cylinder Assembly |
| (3) Steering Column Cover | (8) Instrument Panel Lower Cover |
| (4) Combination Switch and SRS Coil Assembly | (9) Driver Knee Bolster (reinforcement) |
| (5) Snap Ring | (10) Shift Lock Cable (for A/T) |

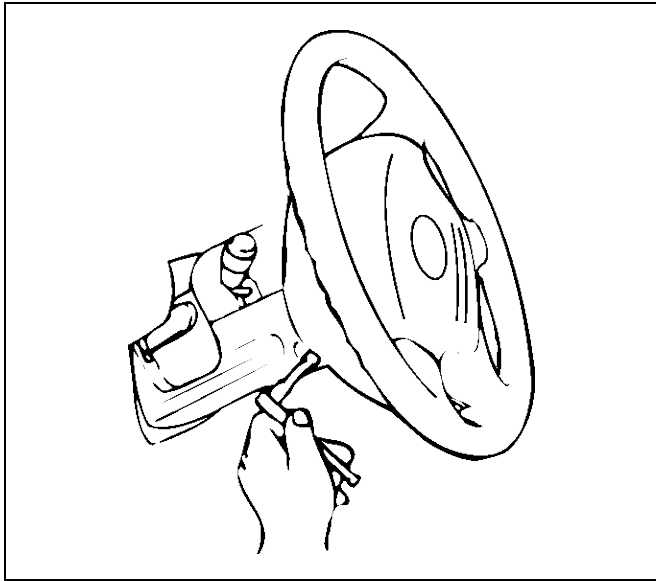
Removal

1. Turn the steering wheel so that the vehicle's wheels are pointing straight ahead.
2. Turn the ignition switch to "LOCK".
3. Disconnect the battery ground cable, and wait at least 5 minutes.
4. Disconnect the yellow 2-way SRS connector located under the steering column.

CAUTION: The wheels of the vehicle must be straight ahead and the steering column in the "LOCK" position before disconnecting the steering wheel. Failure to do so will cause the coil assembly to become uncentered which will cause damage to the coil assembly.

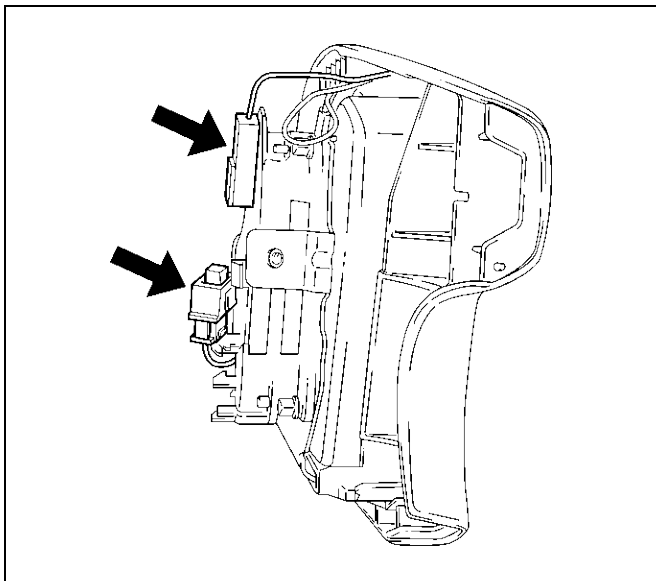
5. Remove the engine hood opening lever and steering lower cover.
6. Remove driver knee bolster (reinforcement).

7. Loosen the inflator module fixing bolt from behind the steering wheel assembly using a TORX® driver or equivalent until the inflator module can be released from steering assembly.



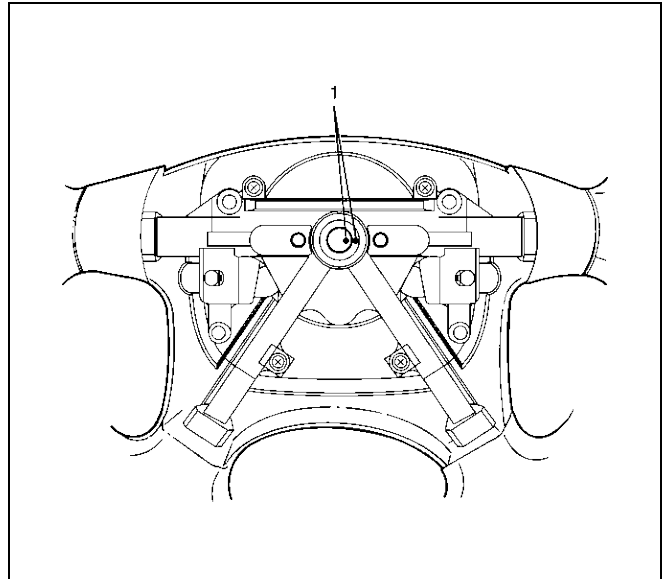
827 RW070

8. Disconnect the yellow 2-way SRS connector and horn lead located behind the inflator module.



827 RW073

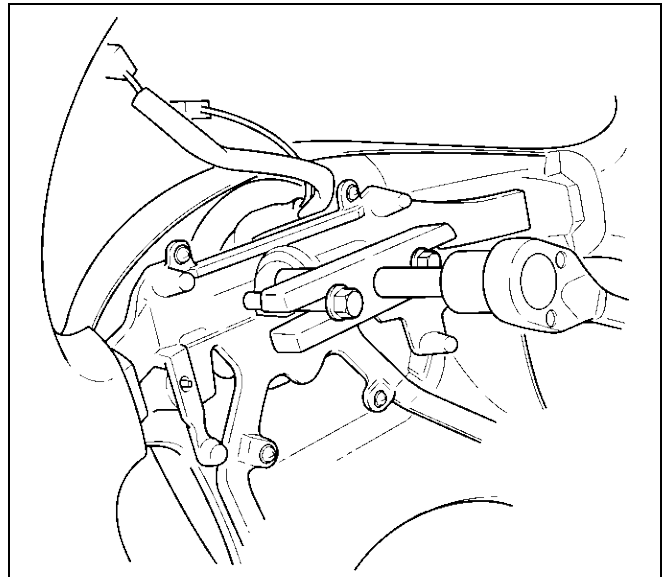
9. Apply a setting mark (1) across the steering wheel and shaft so parts can be reassembled in their original position.



430RW021

10. Move the front wheels to the straight ahead position, then use steering wheel remover J-29752 to remove the steering wheel.

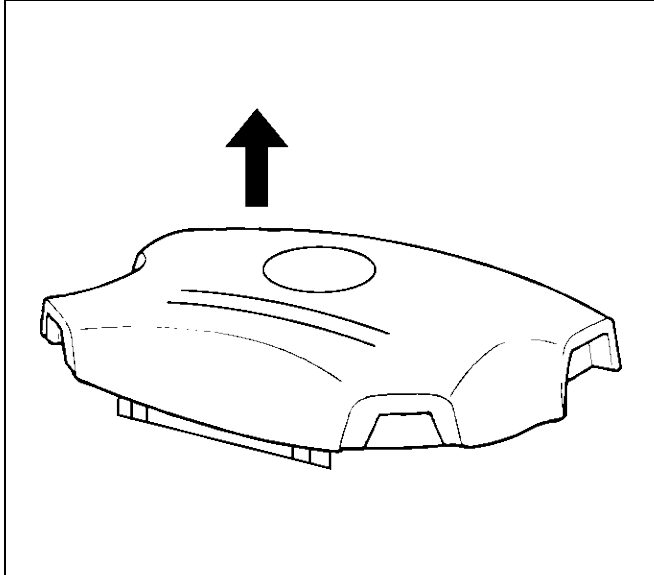
CAUTION: Never apply force to the steering wheel shaft using a hammer or other impact tools in an attempt to remove the steering wheel. The steering shaft is designed as an energy absorbing unit.



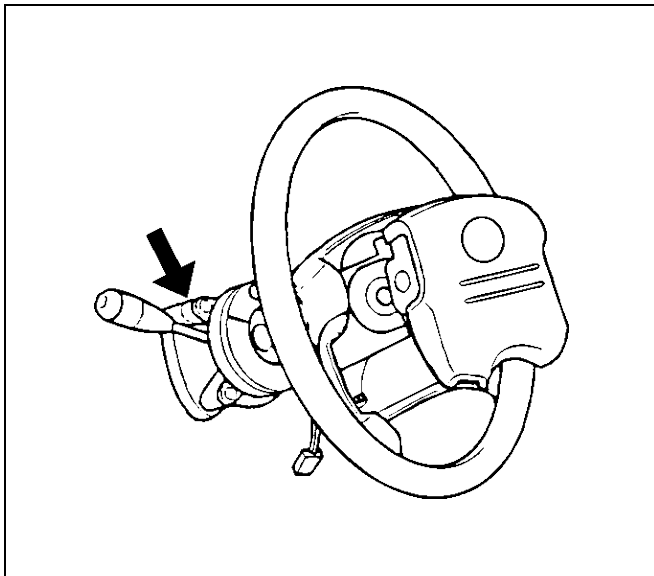
430RX006

2A-42 POWER-ASSISTED STEERING SYSTEM

WARNING: THE INFLATOR MODULE SHOULD ALWAYS BE CARRIED WITH THE TRIM COVER AWAY FROM YOUR BODY AND SHOULD ALWAYS BE LAID ON A FLAT SURFACE WITH THE URETHANE SIDE UP. THIS IS NECESSARY BECAUSE FREE SPACE IS PROVIDED TO ALLOW THE AIR CUSHION TO EXPAND IN THE UNLIKELY EVENT OF ACCIDENTAL DEPLOYMENT. OTHERWISE, PERSONAL INJURY MAY RESULT.



11. Remove steering column cover.
12. Disconnect the wiring harness connectors located under the steering column.
13. Remove the combination switch assembly with SRS coil.

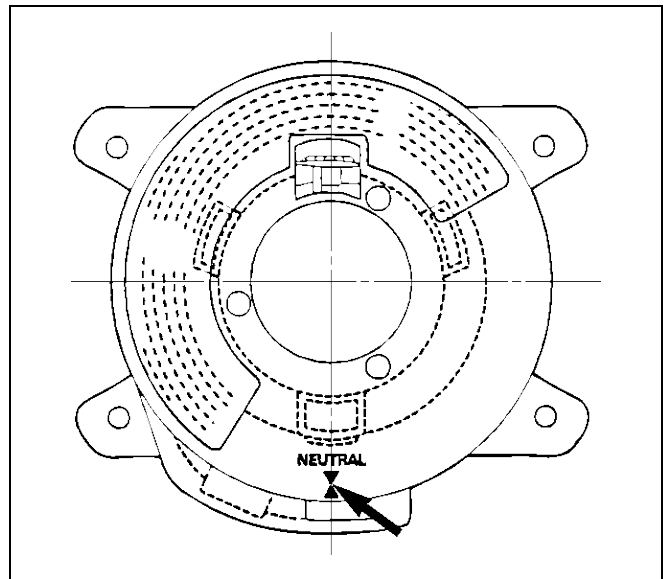


14. Remove snap ring.
15. Remove cushion rubber.
16. Remove shift lock cable (for A/T).
17. Disconnect the starter switch harness connector located under the steering column then remove lock cylinder assembly.

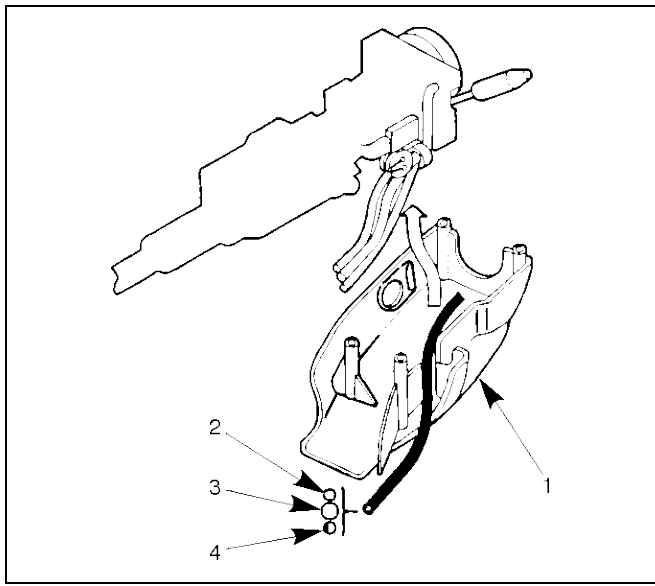
Installation

1. Install lock cylinder assembly.
2. Install shift lock cable (for A/T).
3. Install cushion rubber.
4. Install snap ring.
5. Install Combination switch and SRS coil assembly.
After installation of combination switch assembly, connect the combination switch wiring harness connector and the SRS 2-way connector located under the steering column.
6. Turn the SRS coil counter clockwise to full, return about 3 turns and align the neutral mark.

CAUTION: Turn the SRS coil counter clockwise until some resistance is felt, or damage may occur to the SRS coil.



7. When installing the steering column cover, be sure to wire (through each harness) as illustrated so that the harnesses starter switch, combination switch and SRS coil may not catch wiring.



825 RW017

Legend

- (1) Steering Column Cover
- (2) Starter Switch Harness
- (3) Combination Switch Harness
- (4) Inflator Module Harness

8. Install steering wheel by aligning the setting marks made during removal.

CAUTION: Never apply force to the steering wheel shaft using a hammer or other impact tools in an attempt to remove the steering wheel. The steering shaft is designed as an energy absorbing unit.

9. Tighten the steering wheel fixing nut to the specified torque.

Torque: 34 N·m (25 lbft)

10. Support inflator module and carefully connect the SRS connector and horn lead, then install inflator module.

NOTE: Pass the lead wire through the tabs on the plastic cover (wire protector) of inflator to prevent lead wire from being pinched.

11. Tighten fixing bolts to specified torque.

Torque: 9 N·m (78 lb in)

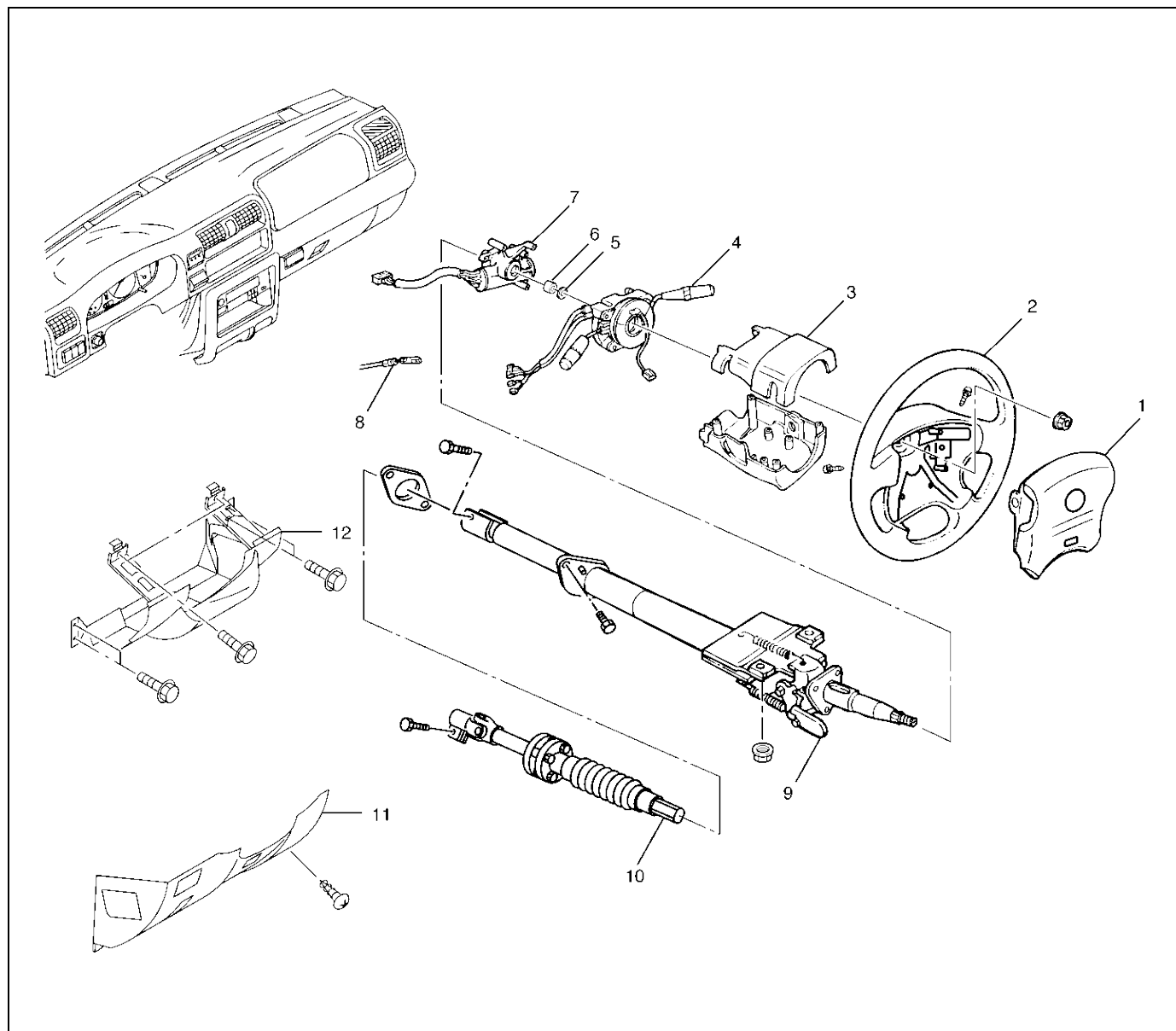
- 12. Install driver knee bolster (reinforcement).
- 13. Install instrument panel lower cover, then install the engine hood opening lever.
- 14. Connect the yellow 2-way SRS connector located under the steering column.
- 15. Connect the battery ground cable.

System Inspection

Turn the ignition switch to the "ON" position and observe the warning lamp. The lamp should flash 7 times. If the lamp does not operate correctly, refer to *Restraints* section.

Steering Column

Steering Column and Associated Parts



Legend

- | | |
|--|--|
| (1) Inflator Module | (7) Lock Cylinder Assembly |
| (2) Steering Wheel | (8) Shift Lock Cable (For A/T) |
| (3) Steering Column Cover | (9) Steering Column Assembly |
| (4) Combination Switch and SRS Coil Assembly | (10) Second Steering Shaft |
| (5) Snap Ring | (11) Instrument Panel Lower Cover |
| (6) Cushion Rubber | (12) Driver Knee Bolster (reinforcement) |

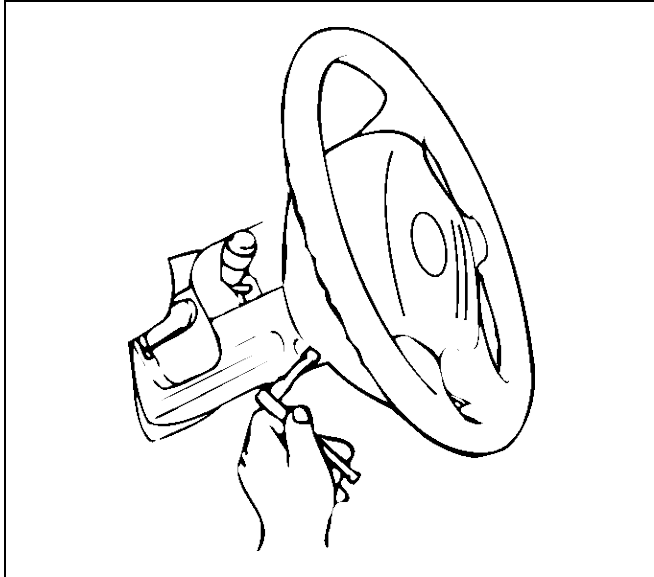
Removal

1. Turn the steering wheel so that the vehicle's wheels are pointing straight ahead.
2. Turn the ignition switch to "LOCK".
3. Disconnect the battery ground cable, and wait at least 5 minutes.

4. Disconnect the yellow 2-way SRS connector located under the steering column.

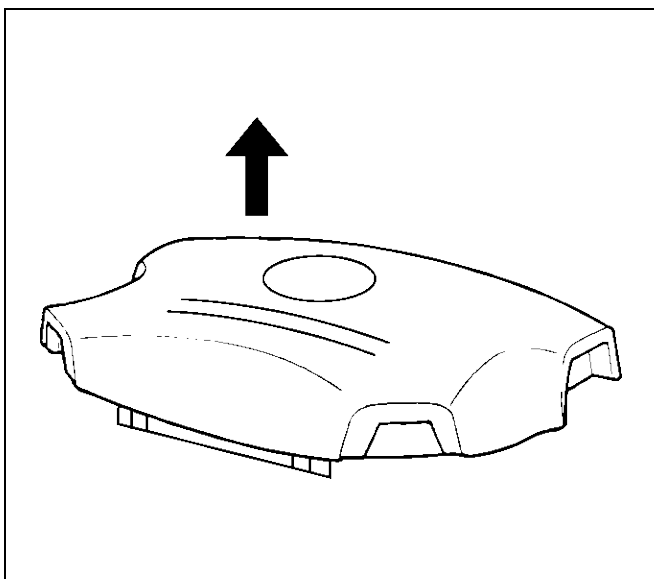
CAUTION: The wheel of the vehicle must be straight ahead and the steering column in the "LOCK" position before disconnecting the steering column from the steering gear. Failure to do so will cause the SRS coil assembly to become uncentered which will cause damage to the SRS coil assembly.

5. Remove the engine hood opening lever, then remove instrument panel lower cover.
6. Remove driver knee bolster (reinforcement).
7. Loosen the inflator module fixing bolt from behind the steering wheel assembly using a TORX® driver or equivalent until the inflator module can be released from steering assembly.

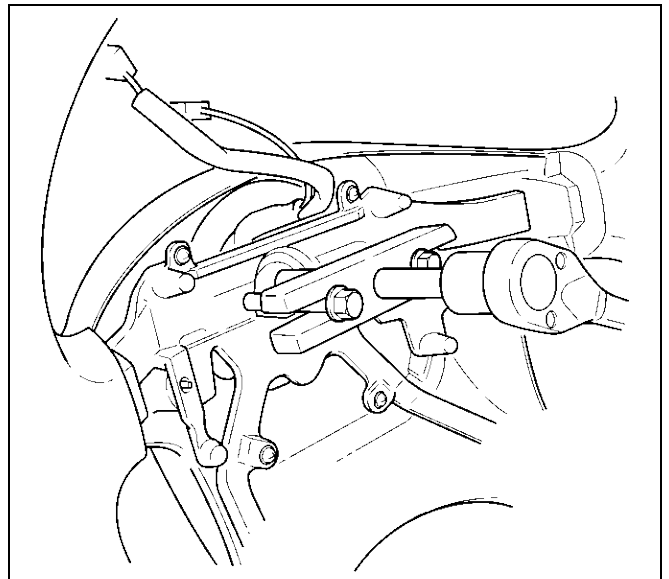
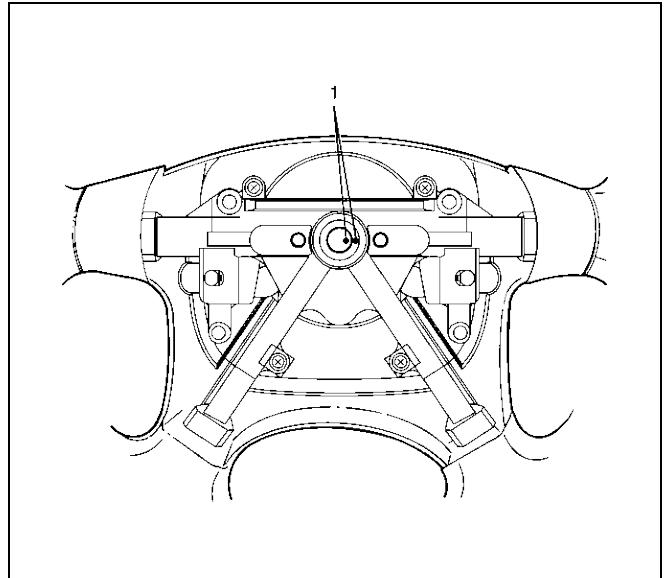


8. Disconnect the yellow 2-way SRS connector and horn lead located behind the inflator module.
9. Remove inflator module.

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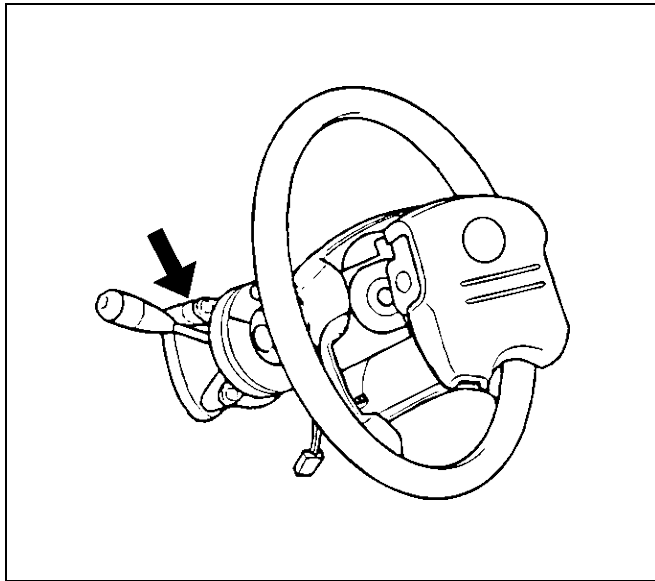


10. Apply a setting mark (1) across the steering wheel and shaft so parts can be reassembled in their original position. Move the front wheels to the straight ahead position, then use steering wheel remover J-29752 to remove the steering wheel.



11. Remove steering column cover.
12. Disconnect the wiring harness connectors located under the steering column.

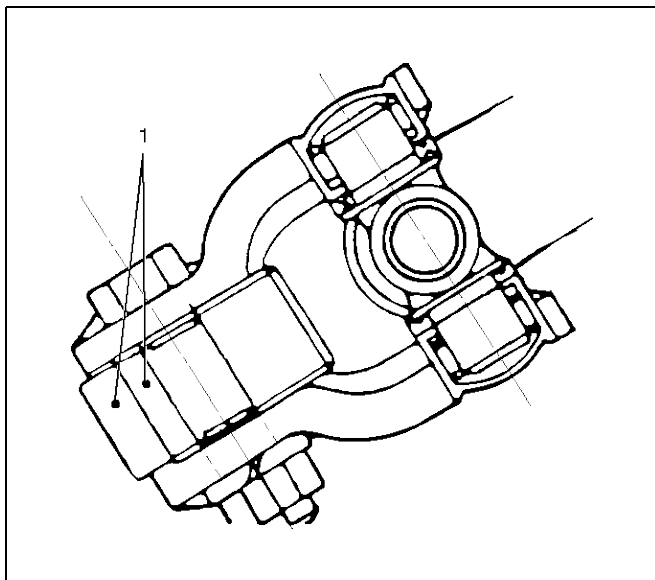
13. Remove the combination switch assembly with SRS coil.



825 RW288

14. Remove snap ring.
 15. Remove cushion rubber.
 16. Remove shift lock cable (For A/T).
 17. Disconnect the starter switch harness connector located under the steering column, then remove lock cylinder assembly.
 18. Apply a setting mark (1) across the universal joint and second steering shaft to reassemble the parts in their original position, then remove steering column assembly and second shaft.

NOTE: A setting mark can be easily made if the shaft is withdrawn a little by loosening the steering shaft universal joint.



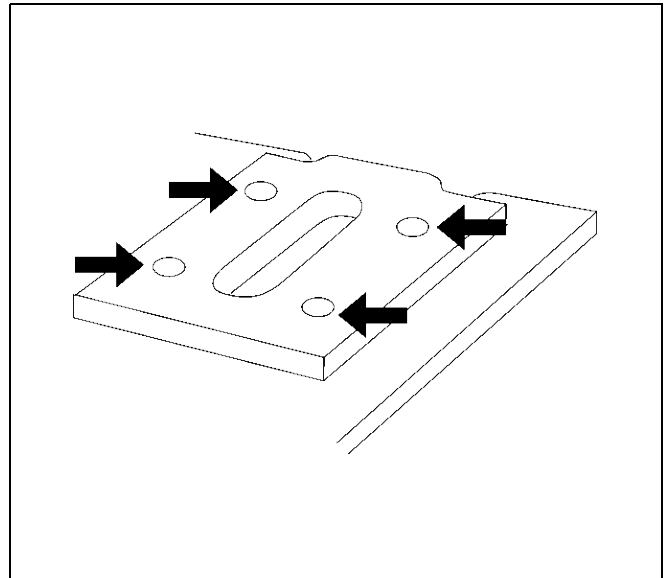
431 RW009

Inspection

If the abnormal conditions are found through inspection, replace the steering column assembly.

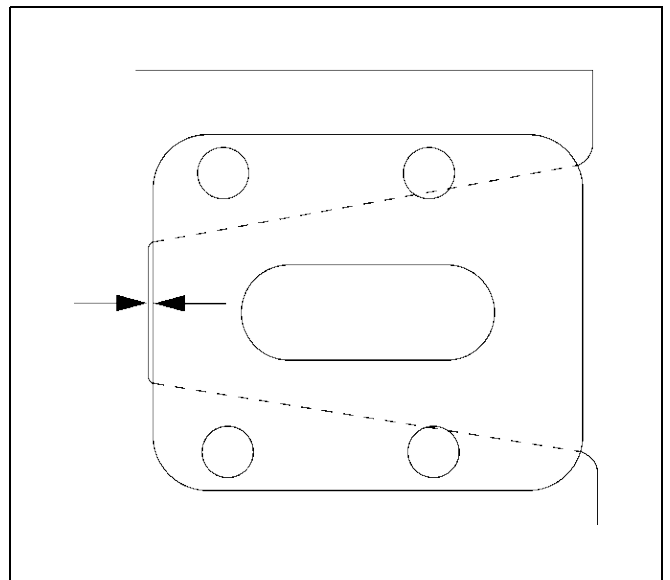
Column Capsule

Check capsules on steering column bracket assembly; all must be securely seated in bracket slots and checked for any loose conditions when pushed or pulled by hand.



431 RW030

Check clearance between capsule and bracket. It must be within 1mm (0.039 in).

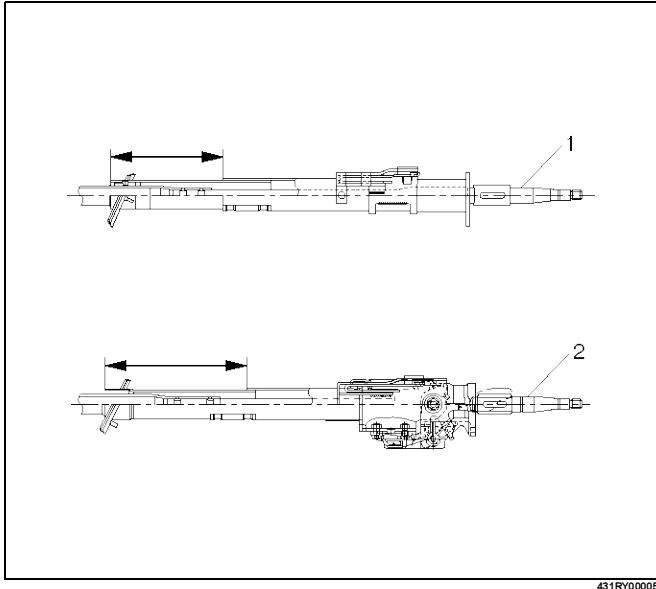


431 RW031

Column Tube

Check for collapses by measuring the distance as shown in the figure.

Standard distance: 162.2-165.8 mm (6.386-6.528 in)



Legend

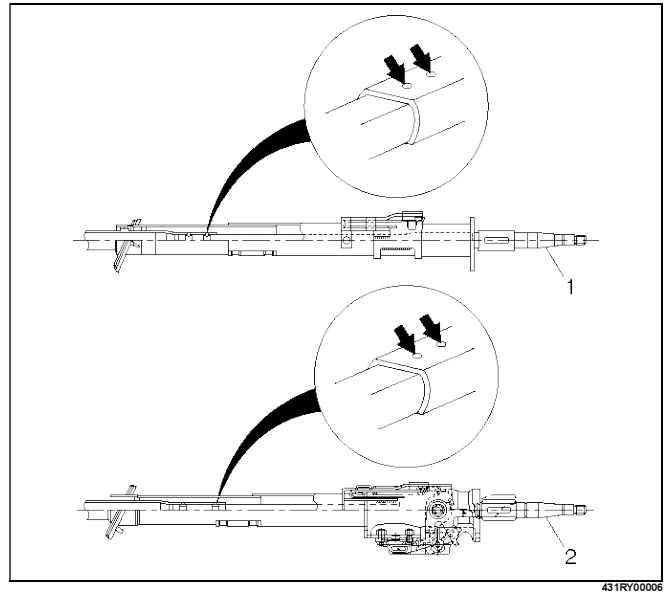
- (1) NON TILT TYPE
- (2) TILT TYPE

Column Universal Joint for Tilt Mechanism

Check steering column assembly for any resistance by rotating the universal joint. If resistance is felt then replace the steering column assembly.

Sheared Injected Plastic Pin

Check the sheared injected plastic pins for any loose conditions or damage.



Legend

- (1) NON TILT TYPE
- (2) TILT TYPE

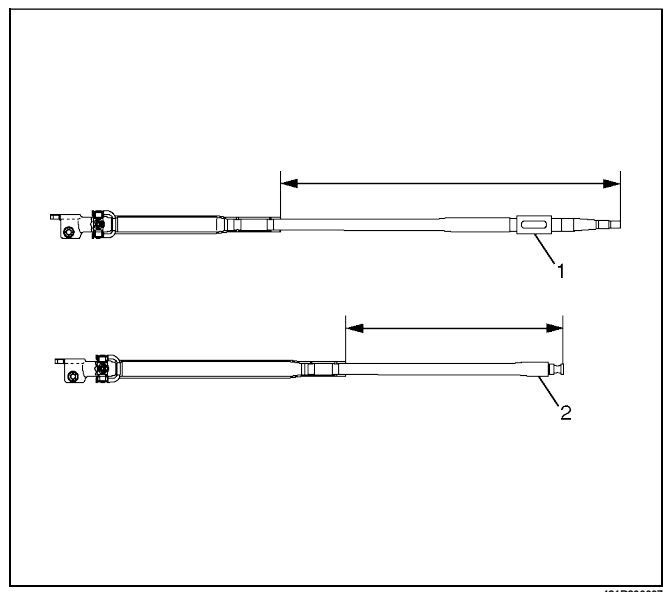
Shaft Length

Check the shaft length from the upper end of the slide joint to the end of the shaft. If column length is not in specifications, steering column should be replaced.

Standard length:

NON TILT TYPE: 540.9–542.9 mm (21.295–21.374 in)

TILT TYPE: 291.7–295.7 mm (11.484–11.642 in)



Legend

- (1) NON TILT TYPE
- (2) TILT TYPE

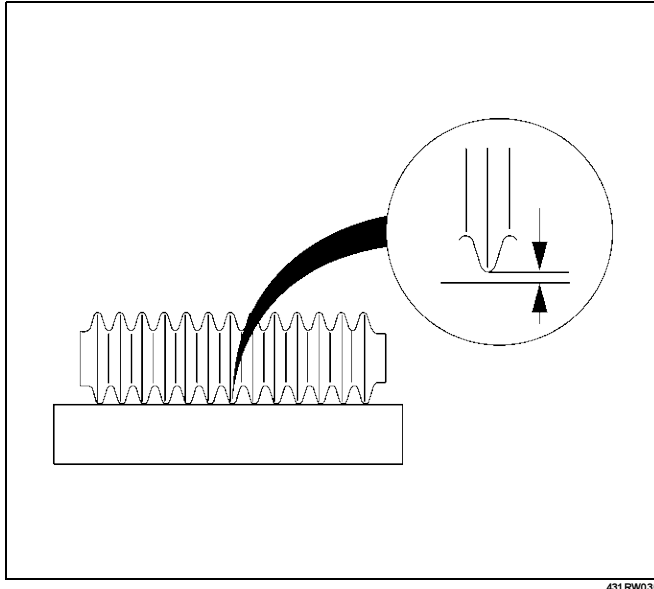
Shaft Universal Joint (Lower End)

If the resistance is felt when checked by rotate the joint, replace the steering column assembly.

Shaft Bellows Pipe

Use a straightedge to inspect the shaft bellows pipe for straightness. Replace if the clearance is more than the specifications.

Standard: Less than 1mm (0.039 in)



431 RW035

Tilt Mechanism

Tilt mechanism should move smoothly. While locked the tilt mechanism, be sure the steering column latch securely by pushing the steering wheel upward and downward.

Installation

1. Install steering column assembly and second steering shaft.
2. Align the setting marks on the universal joint and second steering shaft made during removal.
3. Tighten the steering column fixing bolt (dash panel) to the specified torque.

Torque: 20 N·m (14 lbft)

4. Tighten the steering column fixing nuts (cross beam) to the specified torque.

Torque: 17 N·m (12 lbft)

5. Tighten the universal joint to the specified torque.

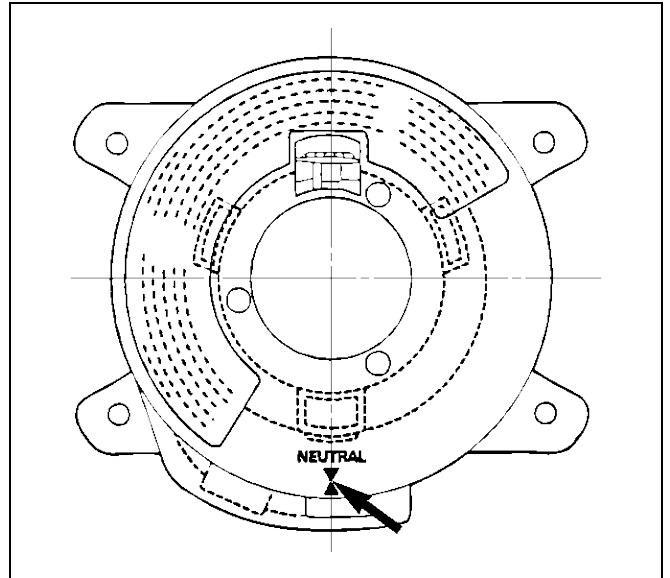
Torque: 31 N·m (23 lbft)

6. Install lock cylinder assembly.
7. Install shift lock cable (For A/T).
8. Install cushion rubber.
9. Install snap ring.

10. Install combination switch and SRS coil assembly. After installation of combination switch assembly, connect the combination switch wiring harness connector and the SRS 2-way connector located under the steering column.

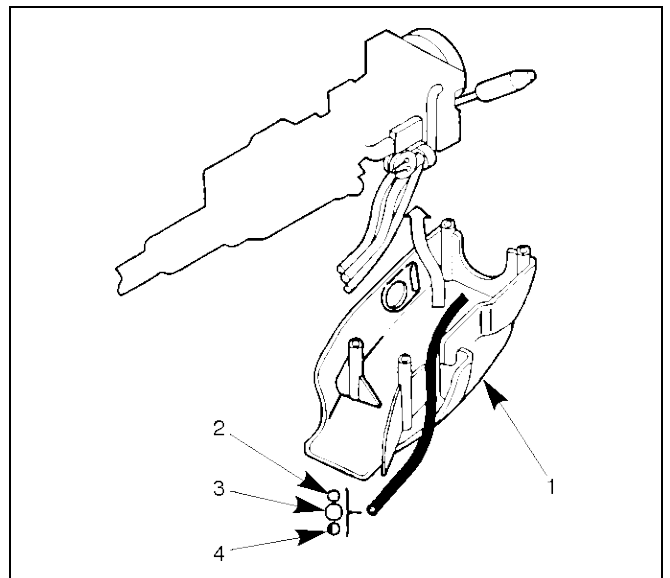
11. Turn the SRS coil counter clockwise to full, return about 3 turns and align the neutral mark.

CAUTION: Turn the SRS coil counter clockwise until a resistance is felt or damage to the SRS coil may occur from over turning.



825RW016

12. When installing the steering column cover, be sure to route each wire harness as illustrated so that the harnesses do not catch any moving parts.



825RW017

Legend

- (1) Steering Column Cover
- (2) Starter Switch Harness
- (3) Combination Switch Harness
- (4) Inflator Module Harness

13. Install steering wheel and align the setting marks made when removing.

CAUTION: Never apply force to the steering wheel shaft using a hammer or other impact tools in an attempt to remove the steering wheel. The steering shaft is designed as an energy absorbing unit.

14. Tighten the steering wheel fixing nut to the specified torque.

Torque: 34 N·m (25 lbft)

15. Support the module and carefully connect the module connector and horn lead, then install inflator module.

NOTE: Pass the lead wire through the tabs on the plastic cover (wire protector) of inflator to prevent lead wire from being pinched.

16. Tighten bolts to specified torque.

Torque: 9 N·m (78 lb in)

17. Install driver knee bolster (reinforcement).
18. Install instrument panel lower cover.
19. Install the engine hood opening lever.
20. Connect the yellow 2-way SRS connector and horn lead located under the steering column.
21. Connect the battery ground cable.

System Inspection

Turn the ignition switch "ON" and observe if the warning lamp flashes 7 times. If the warning lamp does not operate correctly, refer to the *Restraints* section.

