

SUSPENSION

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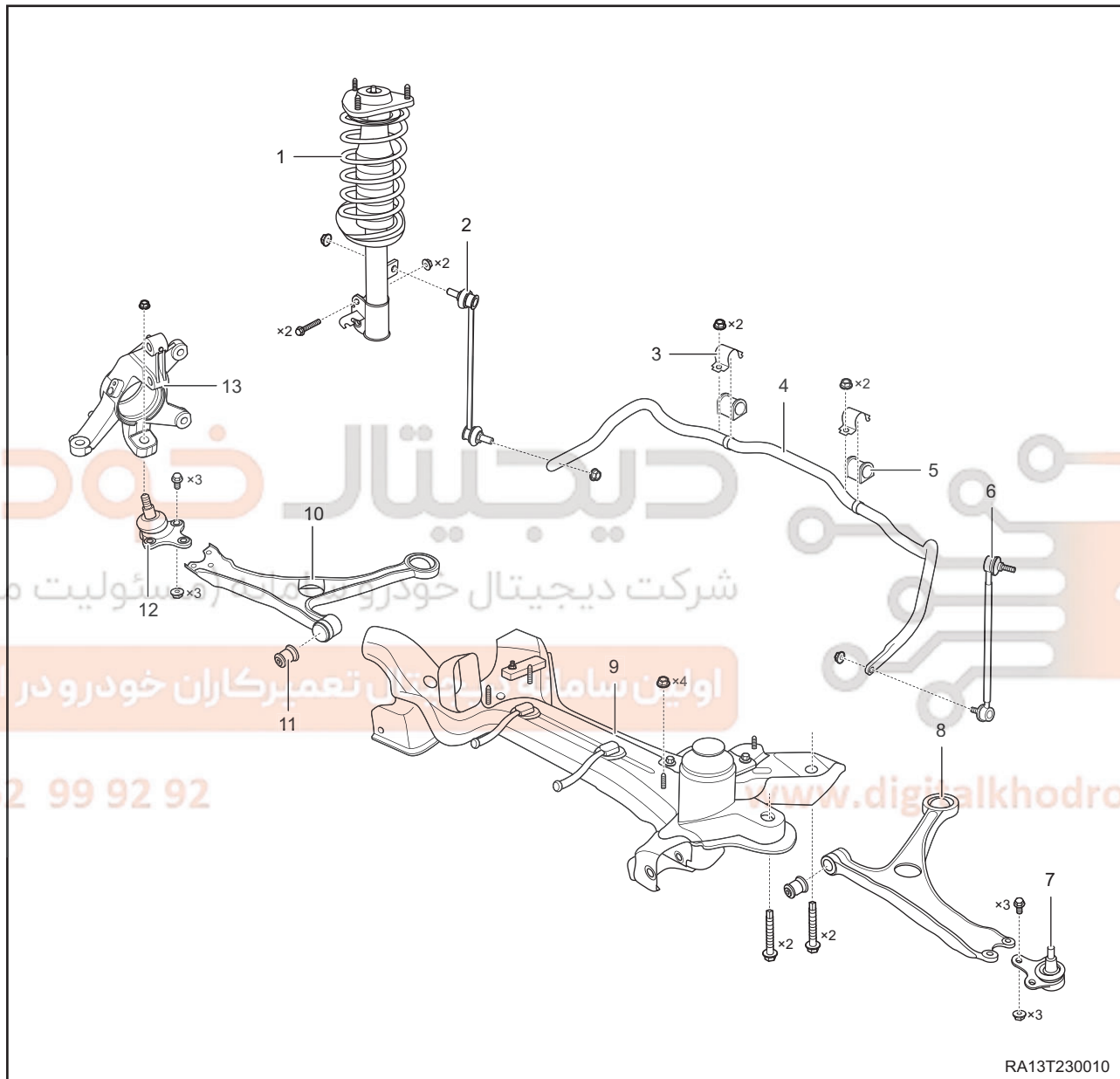
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GENERAL INFORMATION

Description

Front Suspension

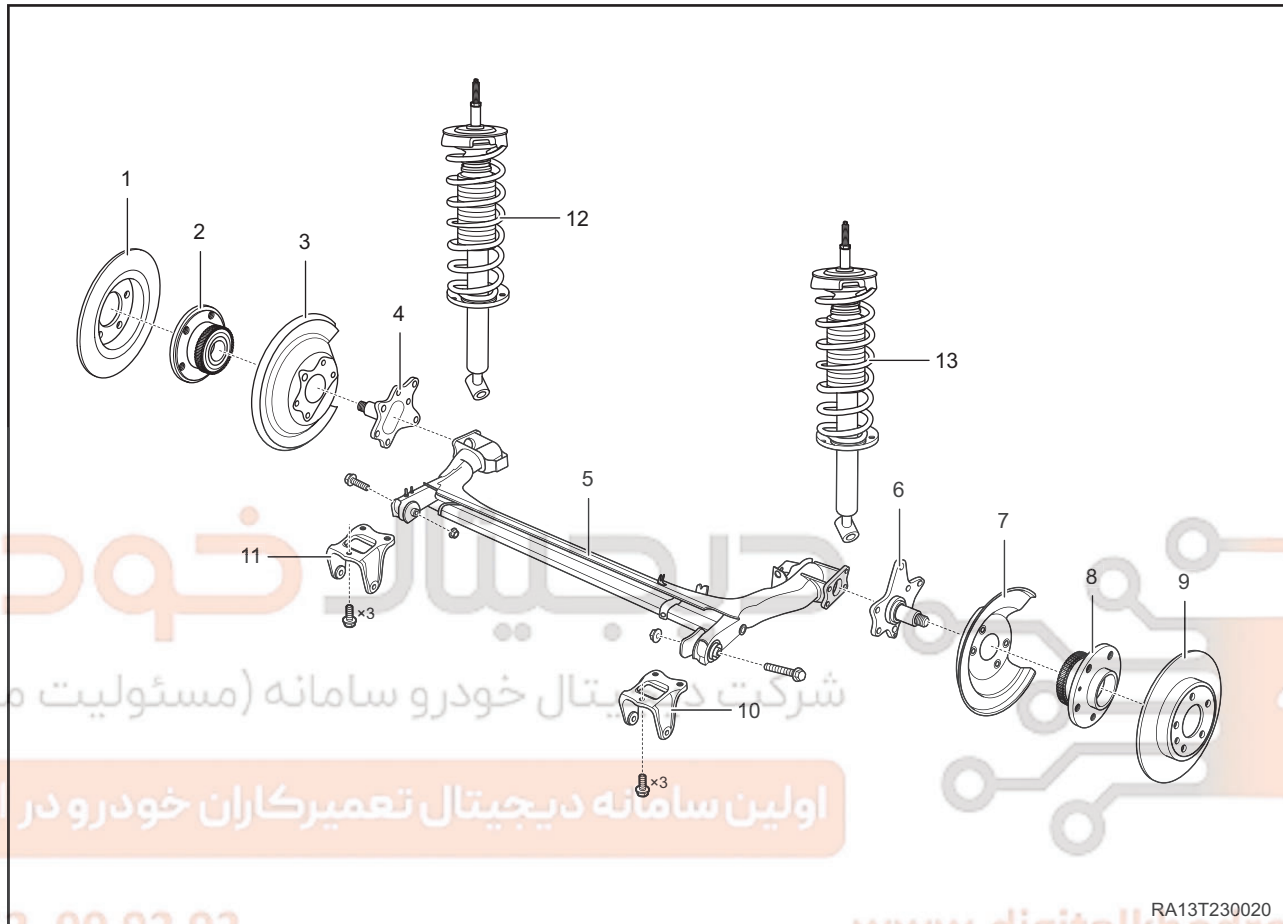


1 - Front Shock Absorber Assembly	2 - Front Right Stabilizer Link Assembly
3 - Horizontal Stabilizer Bar Bracket	4 - Front Stabilizer Bar Assembly
5 - Front Stabilizer Bar Bushing	6 - Front Left Stabilizer Link Assembly
7 - Front Left Control Arm Ball Pin Assembly	8 - Front Left Control Arm Assembly
9 - Front Sub Frame Assembly	10 - Front Right Control Arm Assembly
11 - Control Arm Front Bushing	12 - Front Right Control Arm Ball Pin Assembly
13 - Front Steering Knuckle	

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Front suspension of this model uses Macpherson independent suspension (height is non-adjustable), which is equipped with cylindrical coil spring, double action telescopic shock absorber with lateral stabilizer. Front suspension has driving and steering functions. Upper end of suspension connects with vehicle body, and lower end with front steering knuckle. Sub frame is connected with the body by bolts, thus improving driving stability and safety.

Rear Suspension



1 - Rear Right Brake Disc	2 - Rear Right Hub Bearing
3 - Rear Right Brake Bottom Plate Assembly	4 - Rear Right Hub Shaft
5 - Rear Shaft Assembly	6 - Rear Left Hub Shaft
7 - Rear Left Brake Bottom Plate Assembly	8 - Rear Left Hub Bearing
9 - Rear Left Brake Disc	10 - Rear Left Shaft Bracket Assembly
11 - Rear Right Shaft Bracket Assembly	12 - Rear Right Shock Absorber Assembly
13 - Rear Left Shock Absorber Assembly	

23

Rear suspension of this model uses torsion beam, half-independent suspension (height is non-adjustable), which is equipped with cylindrical coil spring, double action telescopic shock absorber without lateral stabilizer. Upper end of suspension connects with vehicle body, and lower end with rear shaft assembly, thus ensuring the driving stability and safety.

Specifications

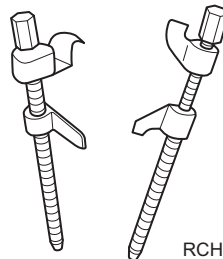
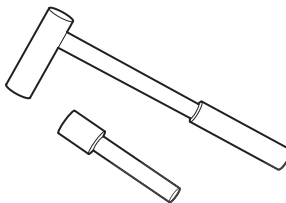
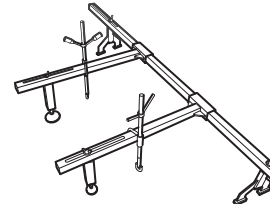
Torque Specifications

Description	Torque (N·m)
Coupling Nut Between Front Stabilizer Link Assembly and Front Shock Absorber Assembly	50 ± 5
Coupling Bolt Between Front Shock Absorber Assembly and Front Steering Knuckle Assembly	110 ± 10
Coupling Nut Between Front Shock Absorber Assembly and Front Steering Knuckle Assembly	110 ± 10
Coupling Nut Between Front Shock Absorber Assembly and Body	50 ± 5
Coupling Nut Between Front Control Arm Assembly Ball Pin and Front Steering Knuckle Assembly	100 ± 10
Coupling Bolt Between Front Part of Front Control Arm Assembly and Front Sub Frame Welding Assembly	135 ± 10
Coupling Nut Between Front Part of Front Control Arm Assembly and Front Sub Frame Welding Assembly	135 ± 10
Coupling Bolt Between Rear Part of Front Control Arm Assembly and Front Sub Frame Welding Assembly	135 ± 10
Coupling Nut Between Rear Part of Front Control Arm Assembly and Front Sub Frame Welding Assembly	135 ± 10
Coupling Nut Between Front Control Arm Ball Pin Assembly and Front Control Arm Assembly	50 ± 5
Coupling Bolt Between Front Control Arm Ball Pin Assembly and Front Control Arm Assembly	50 ± 5
Coupling Nut Between Front Stabilizer Bar Assembly and Front Stabilizer Link Assembly	50 ± 5
Coupling Bolt Between Front Sub Frame Welding Assembly and Steering Gear Assembly	100 ± 10
Coupling Bolt Between Upper Part of Front Sub Frame Welding Assembly and Body	180 ± 10
Coupling Bolt Between Rear Part of Front Sub Frame Welding Assembly and Body	180 ± 10
Coupling Bolt Between Rear Shock Absorber Assembly and Vehicle Body	50 ± 5
Coupling Bolt Between Rear Shock Absorber Assembly and Rear Shaft Assembly	160 ± 10
Coupling Bolt Between Rear Shaft Assembly and Rear Support Assembly	90 ± 5
Steering Tie Rod Locking Nut	50 ~ 60
Steering Wheel Locking Nut	35 ± 3

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Tools

Special Tools

Spring Compressor	 RCH0000021
Shock Absorber Nut Remover	 RCH0000022
Transmission Carrier	 RCH0000005
Engine Equalizer	 RCH0000026

DIAGNOSIS & TESTING

Problem Symptoms Table

HINT:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair or adjust faulty components, or replace as necessary.

Front Suspension

Symptom	Suspected Area	See Page
Vehicle pulls	Front tire (worn or improperly inflated)	24-5
	Front wheel alignment (incorrect)	23-33
	Control arm ball pin assembly (loose)	23-19
	Steering tie rod (loose or worn)	22-10
	Front hub bearing (excessively worn)	22-14
	Front suspension components (excessively worn or deformed)	23-10
Droop	Vehicle (overloaded)	-
	Front coil spring (too soft)	23-14
	Front shock absorber assembly (worn or damaged)	23-12
	Front suspension components (excessively worn or deformed)	23-9
Sways/pitches	Front tire (worn or improperly inflated)	24-7
	Front stabilizer bar assembly (bent or broken)	23-24
	Front shock absorber assembly (worn or damaged)	23-12
Wheel shimmy	Front tire (worn or improperly inflated)	24-5
	Front wheel (out of balance)	24-10
	Front shock absorber assembly (worn or damaged)	23-12
	Front wheel alignment (incorrect)	23-33
	Control arm ball pin assembly (loose)	23-19
	Front hub bearing (excessively worn)	22-14
	Steering gear (misaligned or damaged)	29-21
Droop	Front tire (improperly inflated)	24-5
	Front wheel alignment (incorrect)	23-33
	Front shock absorber assembly (worn or deformed)	23-12
	Front suspension components (worn or deformed)	23-10

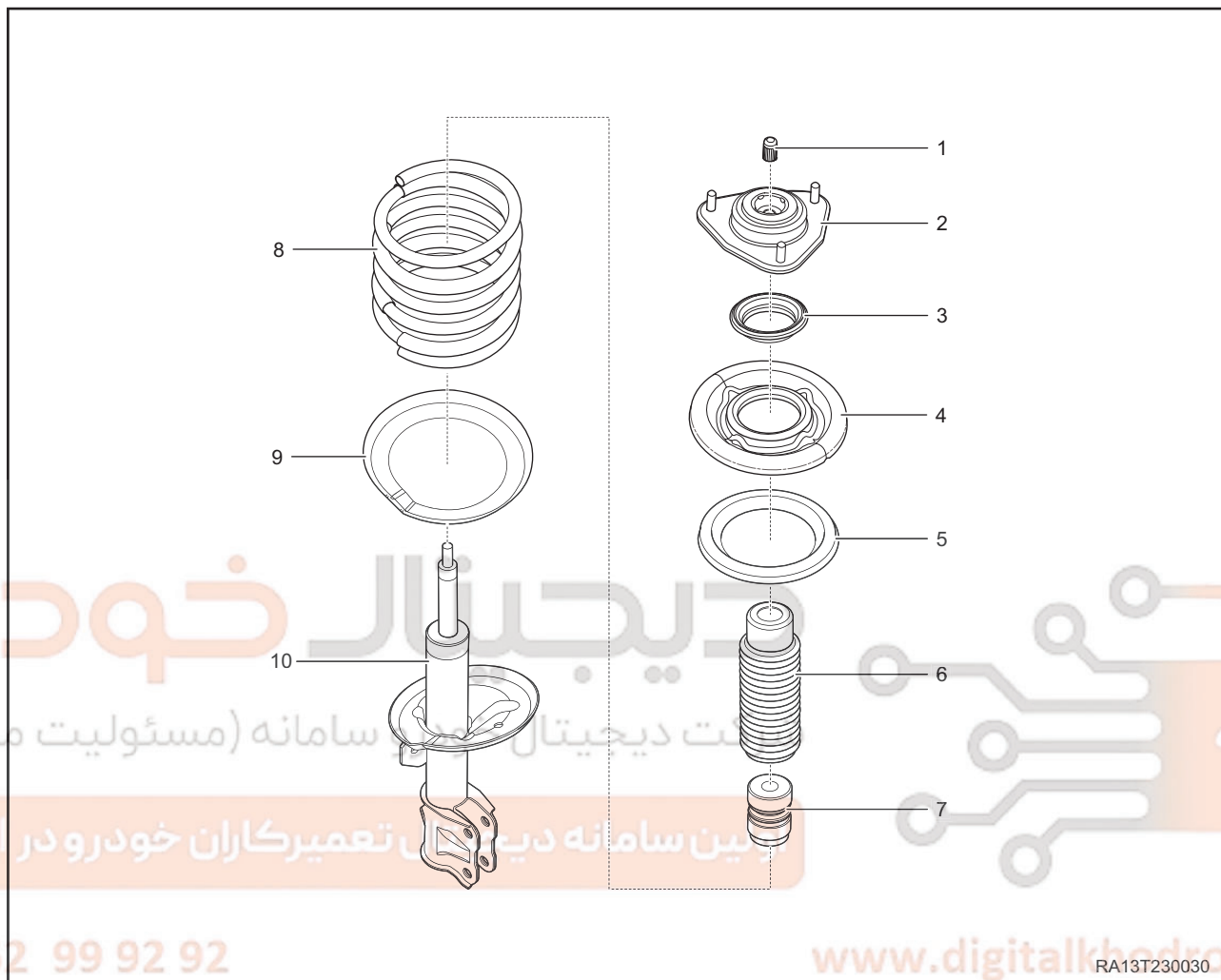
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Rear Suspension

Symptom	Suspected Area	See Page
Vehicle pulls	Rear tire (worn or improperly inflated)	24-5
	Rear wheel alignment (incorrect)	23-33
	Rear hub bearing (excessively worn)	22-21
	Rear suspension components (worn or deformed)	23-4
Droop	Vehicle (overloaded)	-
	Rear coil spring (too soft)	23-30
	Rear shock absorber assembly (worn or damaged)	23-27
	Rear suspension components (excessively worn or deformed)	23-4
Sways/pitches	Rear tire (worn or improperly inflated)	24-5
	Rear shock absorber assembly (worn or deformed)	23-28
Wheel shimmy	Rear tire (worn or improperly inflated)	24-5
	Rear wheel (out of balance)	24-10
	Rear shock absorber assembly (worn or damaged)	23-28
	Rear wheel alignment (incorrect)	23-33
	Rear hub bearing (worn)	22-21
Droop	Rear tire (improperly inflated)	24-5
	Rear wheel alignment (incorrect)	23-33
	Rear suspension components (worn or deformed)	23-4

ON-VEHICLE SERVICE

Front shock absorber assembly



1 - Front Shock Absorber Cover Cap	2 - Front Strut Upper Connecting Plate Assembly (w/ Insulator)
3 - Bearing Assembly	4 - Front Spring Upper Tray
5 - Front Spring Upper Cushion	6 - Front Spring Upper Cushion
7 - Front Buffer Block	8 - Front Coil Spring
9 - Front Spring Lower Cushion	10 - Front Strut Assembly

Front suspension of this model uses Macpherson independent suspension (height is non-adjustable), which is equipped with cylindrical coil spring, double action telescopic shock absorber with lateral stabilizer. Front suspension has driving and steering functions. Upper end of suspension connects with vehicle body, and lower end with front steering knuckle. Sub frame is connected with the body by bolts, thus improving driving stability and safety.

23 - SUSPENSION

On-vehicle Inspection

1. Check the front shock absorber assembly.
 - a. Park the vehicle on a level ground and bounce it up and down, then check if vehicle shakes up and down when vehicle body bounds. If vehicle shakes up and down consecutively, shock absorber assembly may be damaged and should be replaced.
2. Check front shock absorber assembly for leakage.
 - a. As shock absorber assembly operates frequently during vehicle driving, oil gas is formed due to temperature rise of shock absorber, which then adheres to dust boot. This is a normal phenomenon, and it is not necessary to replace the shock absorber assembly.
 - b. Shock absorber is designed with a thin layer of oil film on the surface of piston rod. While the shock absorber is being compressed, the oil film will be scraped off by dust plate on shock absorber oil seal and a small amount of oil will deposit on the upper part of oil seal at the same time. Due to high oil permeability, the oil deposited on the upper part of oil seal spreads slowly from upper part of shock absorber to lower part of shock absorber, thus forming a thin coat of oil film.

When any of the following conditions occurs:

- Oil film is between dust boot and spring seat.
- Oil traces in circumferential direction are even.

For above conditions, oil traces are formed through volatilization, so we can judge it as minor leakage. This is a normal phenomenon, and it is not necessary to replace the shock absorber assembly.

- c. If following conditions occur:

- Oil traces in circumferential direction are uneven.
- Oil traces reach lower connecting positions.

Above conditions indicate that there may be a leakage in shock absorber assembly, and it is necessary to replace the shock absorber assembly.

- d. If it is difficult to accurately judge if shock absorber assembly has leakage from appearance. Perform road test after wiping off oil on the surface of malfunctioning shock absorber. Under normal road conditions, drive vehicle for 5 to 10 minutes and perform inspection. If there are oil traces on the surface of shock absorber assembly, it indicates that oil leakage exists, and it is necessary to replace the shock absorber assembly.

Removal**⚠ WARNING**

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts and guide parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.
- Operate carefully when removing and installing coil spring, to prevent spring from jumping out and causing personal injury.

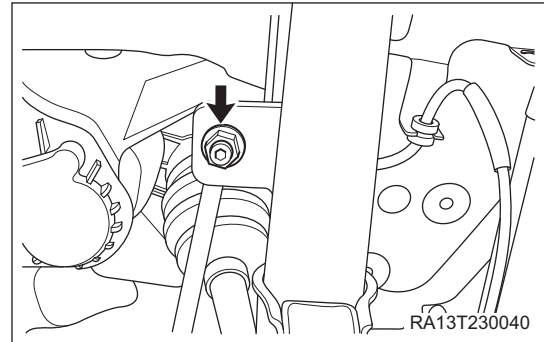
23**HINT:**

- Use same procedures for right and left sides.
 - Procedures listed below are for left side.
1. Remove the front left wheel (See page 24-7).

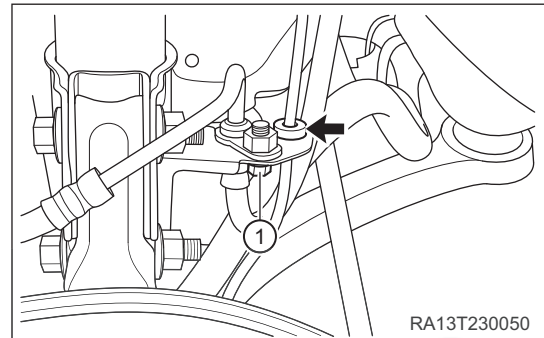
2. Remove the front left shock absorber assembly.

- a. Remove coupling nut (arrow) between front left stabilizer link assembly and front left shock absorber assembly.

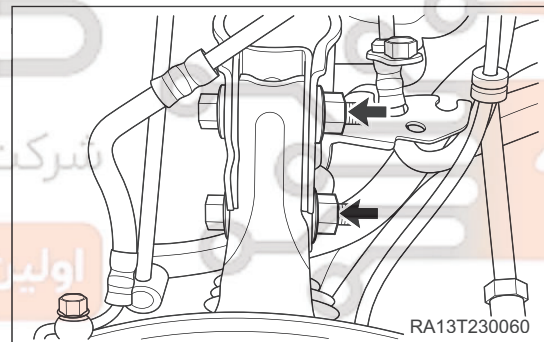
(Tightening torque: 50 ± 5 N·m)



- b. Remove front brake pipe fixing bolt (1) from front left shock absorber assembly, and detach front left wheel speed sensor wiring harness (arrow).



- c. Remove 2 coupling bolts and nuts (arrow) between front left shock absorber assembly and front left steering knuckle assembly.

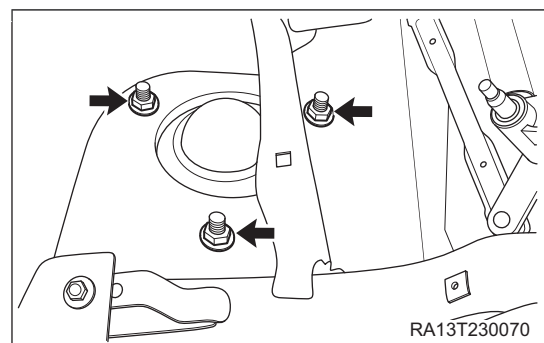


- d. Remove the front wiper arm (See page 36-29).

- e. Remove the front windshield trim cover plate (See page 49-29).

- f. Remove 3 coupling nuts (arrow) between front left shock absorber assembly and vehicle body.

(Tightening torque: 50 ± 5 N·m)



- g. Remove the front left shock absorber assembly with front coil spring.

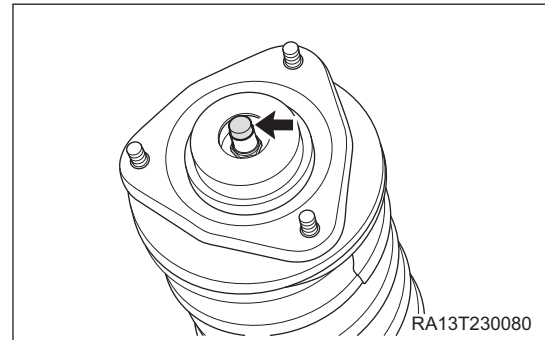
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Disassembly

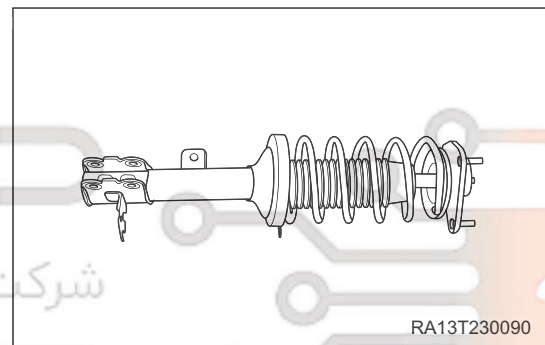
HINT:

- Use same procedures for right and left sides.
- Procedures listed below are for left side.

1. Remove the front shock absorber cover cap.
 - a. Remove the front shock absorber cover cap (arrow) from front left shock absorber assembly.



2. Remove locking nut from front shock absorber assembly.
 - a. Using spring compressor and wrench, tighten the end lever of spring compressor to compress front coil spring.

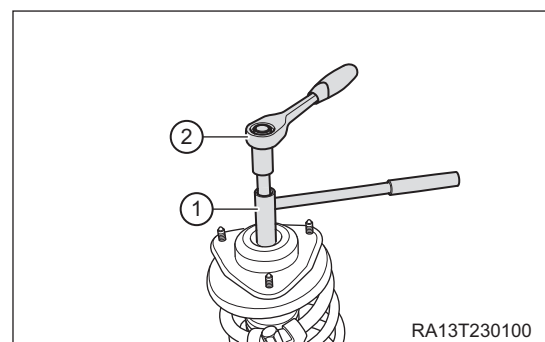


⚠ WARNING

- When removing front coil spring, compress spring until locking nut can be rotated. DO NOT compress spring more than necessary to avoid spring damage and personal injury.

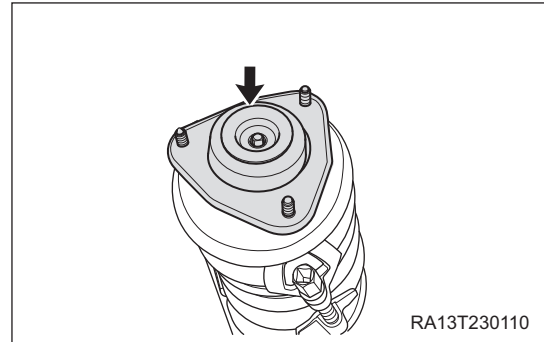
- b. Hold the end of front left shock absorber assembly lever with a shock absorber nut remover (1), and then remove locking nut from front left shock absorber assembly with a wrench (2).

(Tightening torque: 82 ± 5 N·m)



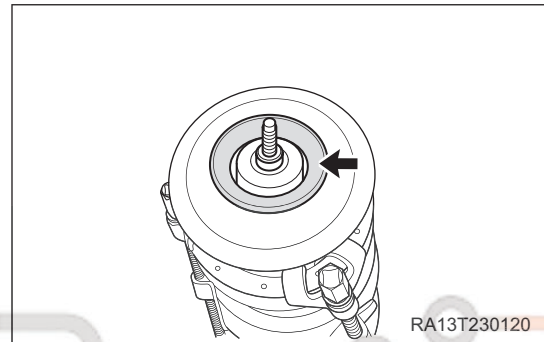
3. Remove the front strut upper connecting plate assembly (w/ insulator).

- a. Remove the front strut upper connecting plate assembly (w/ insulator) (arrow) from the upper part of front left shock absorber assembly.



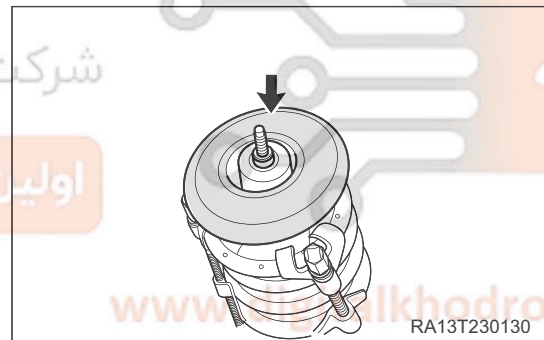
4. Remove the bearing assembly.

- a. Remove the bearing assembly (arrow) from the upper part of front left shock absorber assembly.



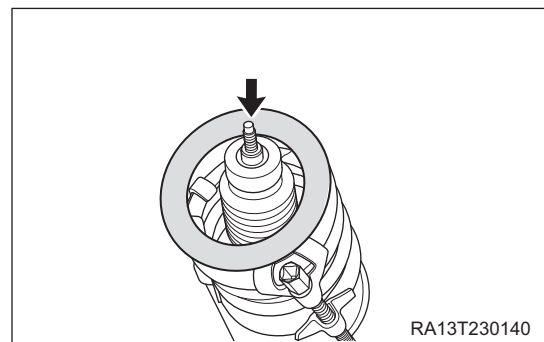
5. Remove the front spring upper tray.

- a. Remove the front spring upper tray (arrow) from the upper part of front left shock absorber assembly.



6. Remove the front spring upper cushion.

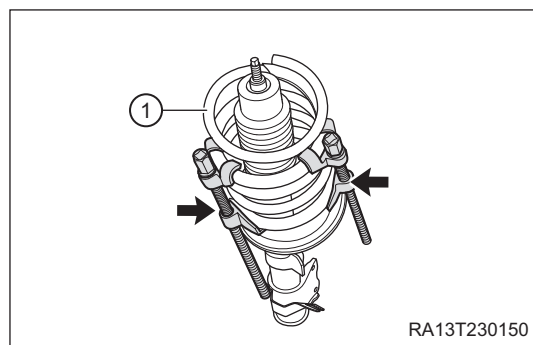
- a. Remove the front spring upper cushion (arrow) from the upper part of front left shock absorber assembly.



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7. Remove the front coil spring.

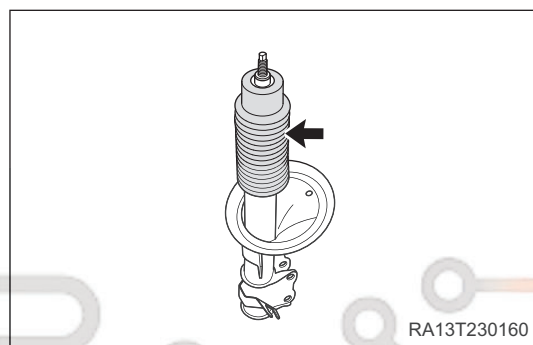
- a. Remove the front coil spring (1) with spring compressor (arrow) from front left shock absorber assembly.



- b. Slowly loosen the spring compressor, and carefully remove the front coil spring.

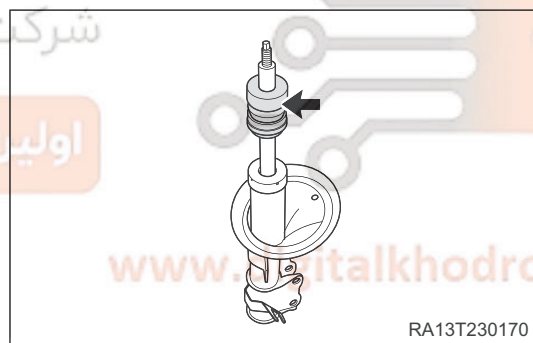
8. Remove the front dust boot.

- a. Remove the front dust boot (arrow) from the upper part of front left shock absorber assembly.



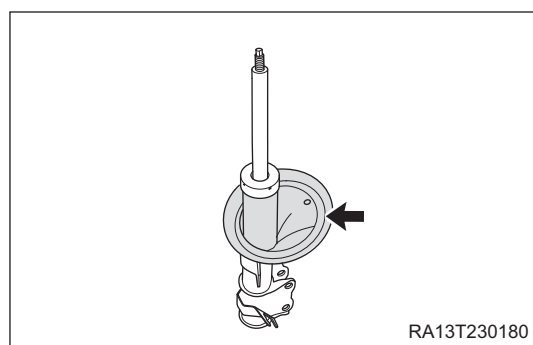
9. Remove the front buffer block.

- a. Detach the front buffer block (arrow) from front left shock absorber assembly, and remove it.



10. Remove the front spring lower cushion.

- a. Remove the front spring lower cushion (arrow) from the lower end of front left shock absorber assembly strut.

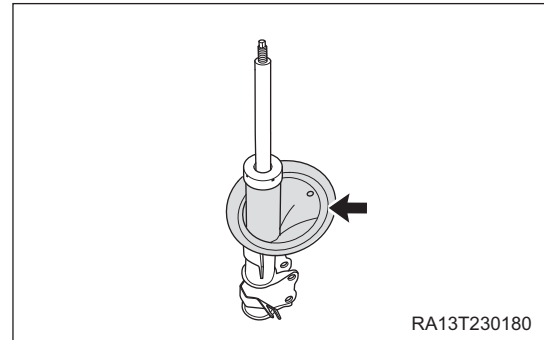


Inspection

1. Check front shock absorber assembly

Manual check:

- Install locking nut (1) to upper end of front shock absorber assembly strut, and then install T-wrench (2) or equivalent.
- Compress and extend front shock absorber assembly strut several times by hands in direction of arrow as shown in illustration. Check that there is no abnormal resistance or unusual sound during operation. If there is any abnormality, replace the front shock absorber assembly with a new one.



2. Check the other components of front shock absorber assembly

- Check front shock absorber cover cap, front spring upper cushion, front dust boot, front buffer block and front spring lower cushion for cracks, wear or deformation. Replace as necessary.
- Check front strut upper connecting plate assembly (w/ insulator) and bearing assembly for damage. Replace as necessary.
- Check front coil spring for wear, cracks or deformation. Replace as necessary.

Assembly

Assembly is in the reverse order of disassembly.

CAUTION

- Please note that opening of retainer must face opening of the front wheel speed sensor, when installing front hub bearing retainer.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.
- Check wheel alignment after installation is completed. Adjust wheel alignment to standard range as necessary.

23 - SUSPENSION

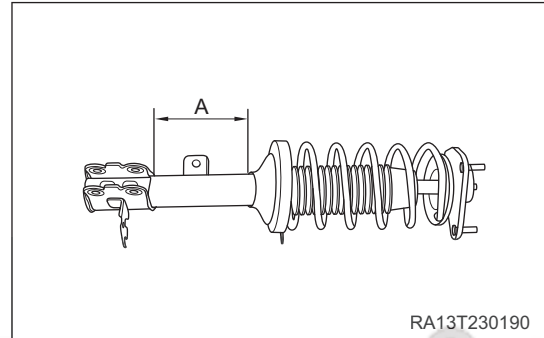
Disposal

 CAUTION

- Shock absorber assembly contains nitrogen and oil, which are under negative pressure. Before handling, be sure to wear goggles and release pressure inside the shock absorber assembly to avoid personal injury.

1. Dispose the front shock absorber assembly.

- a. Extend the front shock absorber assembly strut fully, and clamp it in a vise at an angle.
- b. Using a drill or equivalent, make a hole slowly at area A shown in illustration to discharge gas from front shock absorber assembly.



- c. Gas discharged from shock absorber is colorless and harmless. Be careful when drilling, because iron chips may fly out.

 ENVIRONMENTAL PROTECTION

- Recycle disposed front shock absorber assembly according to local environmental regulations.

Front Control Arm Assembly

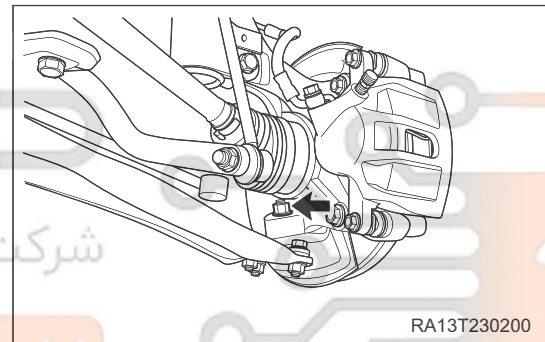
Removal

WARNING

- Be sure to wear necessary safety equipment to prevent accidents.
- Check if safety lock of lift is locked when repairing chassis parts.
- It is not permitted to weld or modify suspension bearing parts and guide parts.
- When removing chassis parts, replace self-locking nuts and rusted nuts for safety.

HINT:

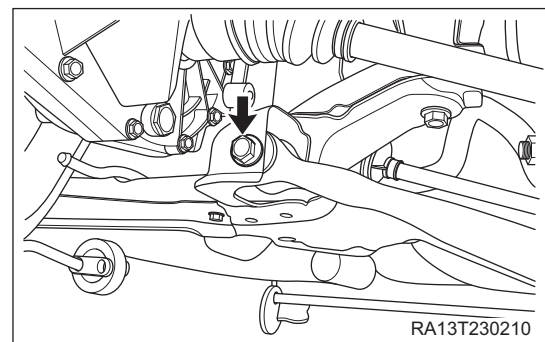
- Use same procedures for right and left sides.
 - Procedures listed below are for left side.
1. Remove the front left wheel (See page 24-7).
 2. Remove the front left control arm assembly.
 - a. Remove coupling nut (arrow) between front left control arm assembly ball pin and front left steering knuckle assembly.
(Tightening torque: $100 \pm 10 \text{ N}\cdot\text{m}$)



CAUTION

- If it is difficult to remove control arm ball pin end from steering knuckle, detach ball pin by striking the end of steering knuckle uniformly and slightly with a hammer or equivalent.

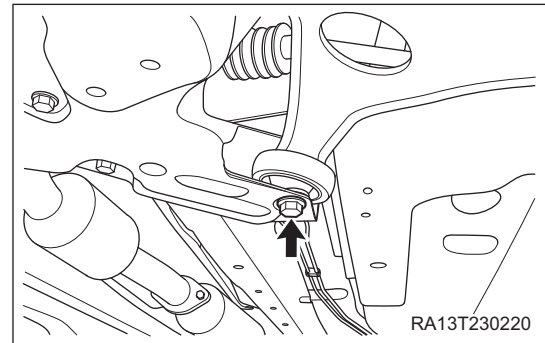
- b. Remove coupling bolt and nut (arrow) between front part of front left control arm assembly and front sub frame welding assembly.
(Tightening torque: $135 \pm 5 \text{ N}\cdot\text{m}$)



23 - SUSPENSION

- c. Remove coupling bolt and nut (arrow) between rear part of front left control arm assembly and front sub frame welding assembly.

(Tightening torque for rear bolt: 160 ± 16 N·m)



- d. Remove the front left control arm assembly with ball pin.

Installation

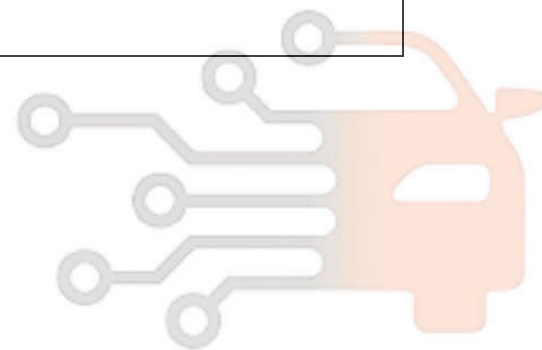
Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.
- Make sure that ball pin assembly rotates smoothly and there is no seizing after installation.
- Check wheel alignment after installation is completed. Adjust wheel alignment to standard range as necessary.

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Front Control Arm Ball Pin Assembly

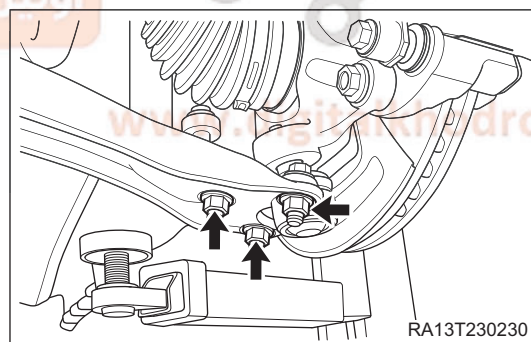
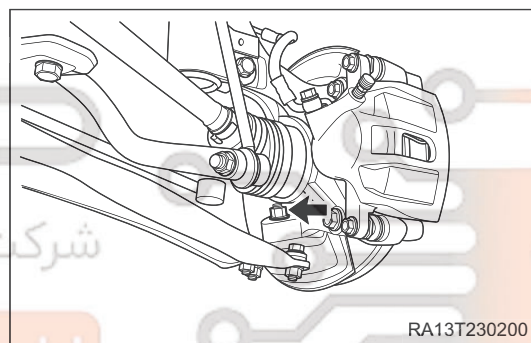
Removal

WARNING

- Be sure to wear necessary safety equipment to prevent accidents.
- Check if safety lock of lift is locked when repairing chassis parts.
- It is not permitted to weld or modify suspension bearing parts and guide parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

HINT:

- Use same procedures for right and left sides.
 - Procedures listed below are for left side.
1. Remove the front wheel (See page 24-9).
 2. Remove the front left control arm ball pin assembly.
 - a. Remove coupling nut (arrow) between front left control arm assembly ball pin and front left steering knuckle assembly.
(Tightening torque: $100 \pm 5 \text{ N}\cdot\text{m}$)
 - b. Remove 3 coupling bolts and nuts (arrow) between front left control arm and front left control arm ball pin.
(Tightening torque: $50 \pm 5 \text{ N}\cdot\text{m}$)



- c. Remove the front left control arm ball pin assembly.

Inspection

1. Check the control arm ball pin assembly.
 - a. Check control arm assembly ball pin bushing for wear, cracks, deformation, damage or grease leakage. Replace as necessary.
 - b. Check if control arm assembly ball pin rotates smoothly. Replace as necessary.

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Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.
- Make sure that ball pin assembly rotates smoothly and there is no seizing after installation.
- Check wheel alignment after installation is completed. Adjust wheel alignment to standard range as necessary.

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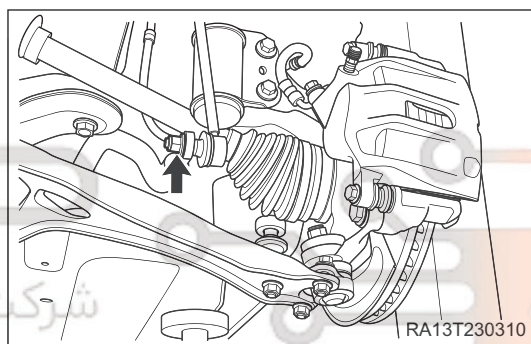
Front Stabilizer Bar Assembly

Removal

CAUTION

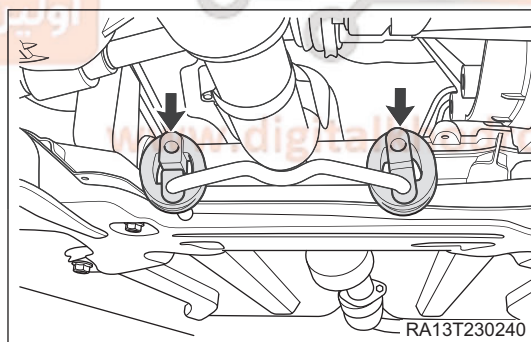
- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.
- When lowering front sub frame welding assembly, you need to support engine and transmission assembly securely with engine equalizer to avoid damage.

1. Remove the front wheel (See page 24-7).
2. Remove the front stabilizer bar assembly.
 - a. Remove fixing nut (arrow) connecting stabilizer bar and small connecting rod.

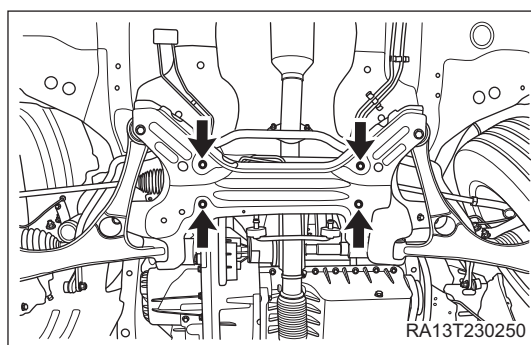


- b. Using an engine equalizer, support the engine and transmission assembly securely.

- c. Detach exhaust pipe fixing rubber lugs (arrow) from front sub frame welding assembly.

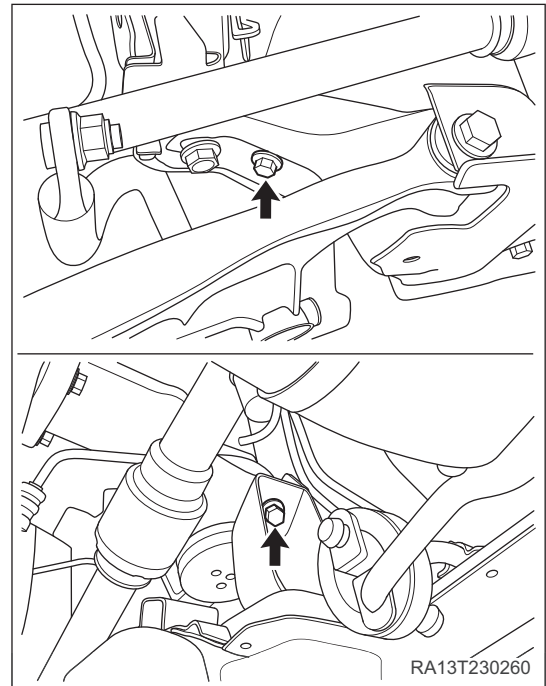


- d. Remove 4 fixing bolts (arrow) between power steering with tie rod assembly and sub frame.
(Tightening torque: 30 ± 3 N·m)

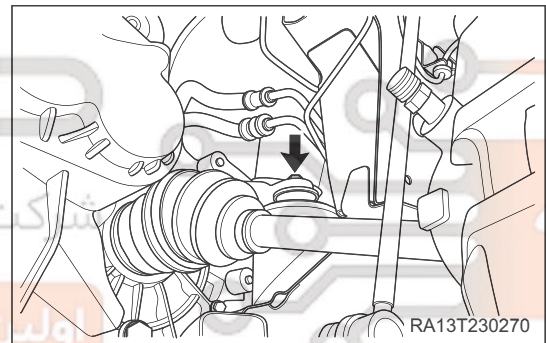


23 - SUSPENSION

- e. Remove 2 fixing bolts (arrow) between engine right mounting cushion and sub frame.
(Tightening torque: $65 \pm 5 \text{ N}\cdot\text{m}$)



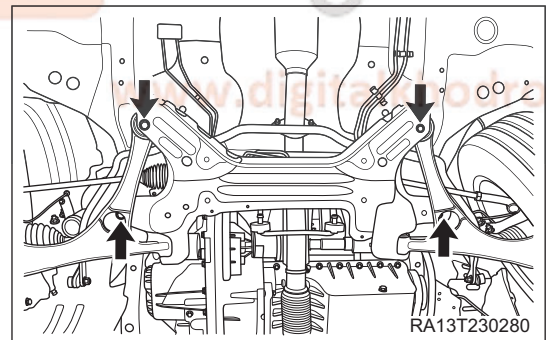
- f. Remove fixing bolt (arrow) between transmission left mounting cushion and left mounting bracket.
(Tightening torque: $65 \pm 5 \text{ N}\cdot\text{m}$)



- g. Remove 4 fixing bolts (arrow) between sub frame and vehicle body.

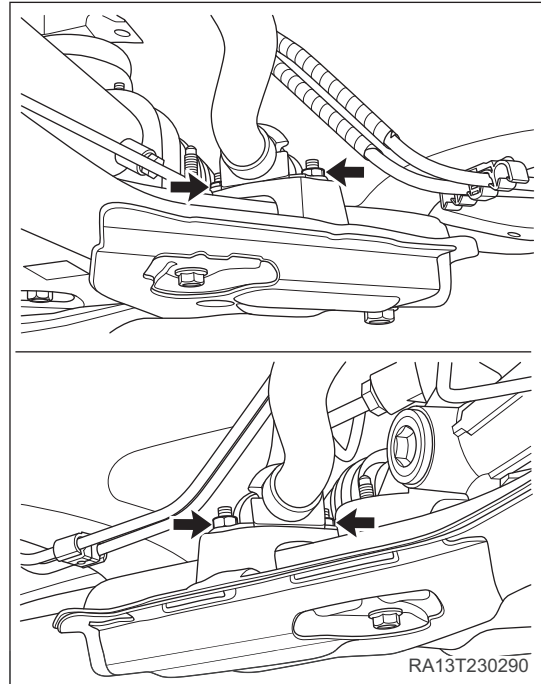
(Tightening torque for front bolt: $135 \pm 5 \text{ N}\cdot\text{m}$)

(Tightening torque for rear bolt: $160 \pm 16 \text{ N}\cdot\text{m}$)

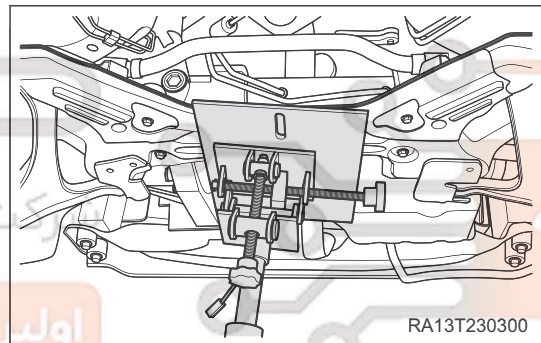


23 - SUSPENSION

- h. Remove 4 fixing nuts between sub frame and stabilizer bar.

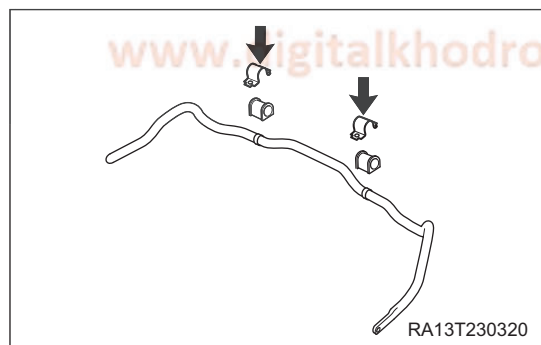


- i. Using a transmission carrier, support front sub frame welding assembly.

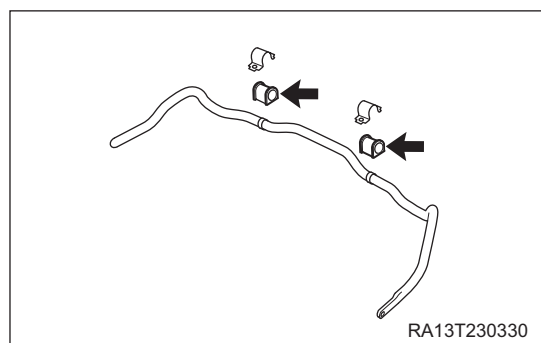


- j. Lower front sub frame welding assembly, remove front stabilizer bar assembly.

- k. Detach left and right fixing clamps (arrow) from front stabilizer bar assembly.



- l. Detach left and right rubber supports (arrow) from front stabilizer bar assembly.



23 - SUSPENSION

Inspection

1. Check front stabilizer bar assembly
 - a. Check fixing clamps of front stabilizer bar assembly for wear, cracks or damage. Replace as necessary.
 - b. Check rubber supports of front stabilizer bar assembly for dirt, wear, cracks, deformation or damage. Replace as necessary.

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.

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Front Stabilizer Link Assembly

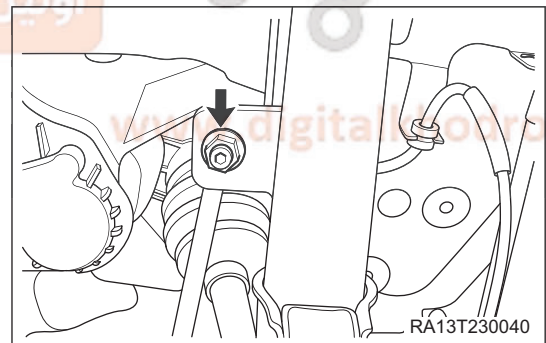
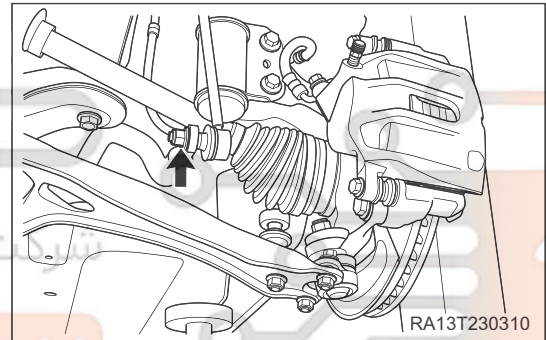
Removal

CAUTION

- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

HINT:

- Use same procedures for right and left sides.
 - Procedures listed below are for left side.
1. Remove the rear wheel (See page 24-7).
 2. Remove the front left stabilizer link assembly.
 - a. Hold lower end of front left stabilizer link assembly with an inner hexagon wrench, and remove coupling nut (arrow) between front left stabilizer bar assembly and front left stabilizer link assembly with a fixing wrench.
(Tightening torque: $50 \pm 5 \text{ N}\cdot\text{m}$)
 - b. Hold lower end of front left stabilizer link assembly with an inner hexagon wrench, and remove coupling nut (arrow) between front left stabilizer bar assembly and front left stabilizer link assembly with a fixing wrench.
(Tightening torque: $50 \pm 5 \text{ N}\cdot\text{m}$)



- c. Remove the front left stabilizer link assembly.

Inspection

1. Check the front stabilizer link assembly.
 - a. Check front stabilizer link assembly bushing for wear, cracks, deformation, damage or grease leakage. Replace as necessary.
 - b. Check if the end of front stabilizer link assembly rotates smoothly. Replace as necessary.

23 - SUSPENSION

Installation

Installation is in the reverse order of removal.

CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.
- Make sure that end of front stabilizer link assembly rotates smoothly and there is no seizing after installation.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

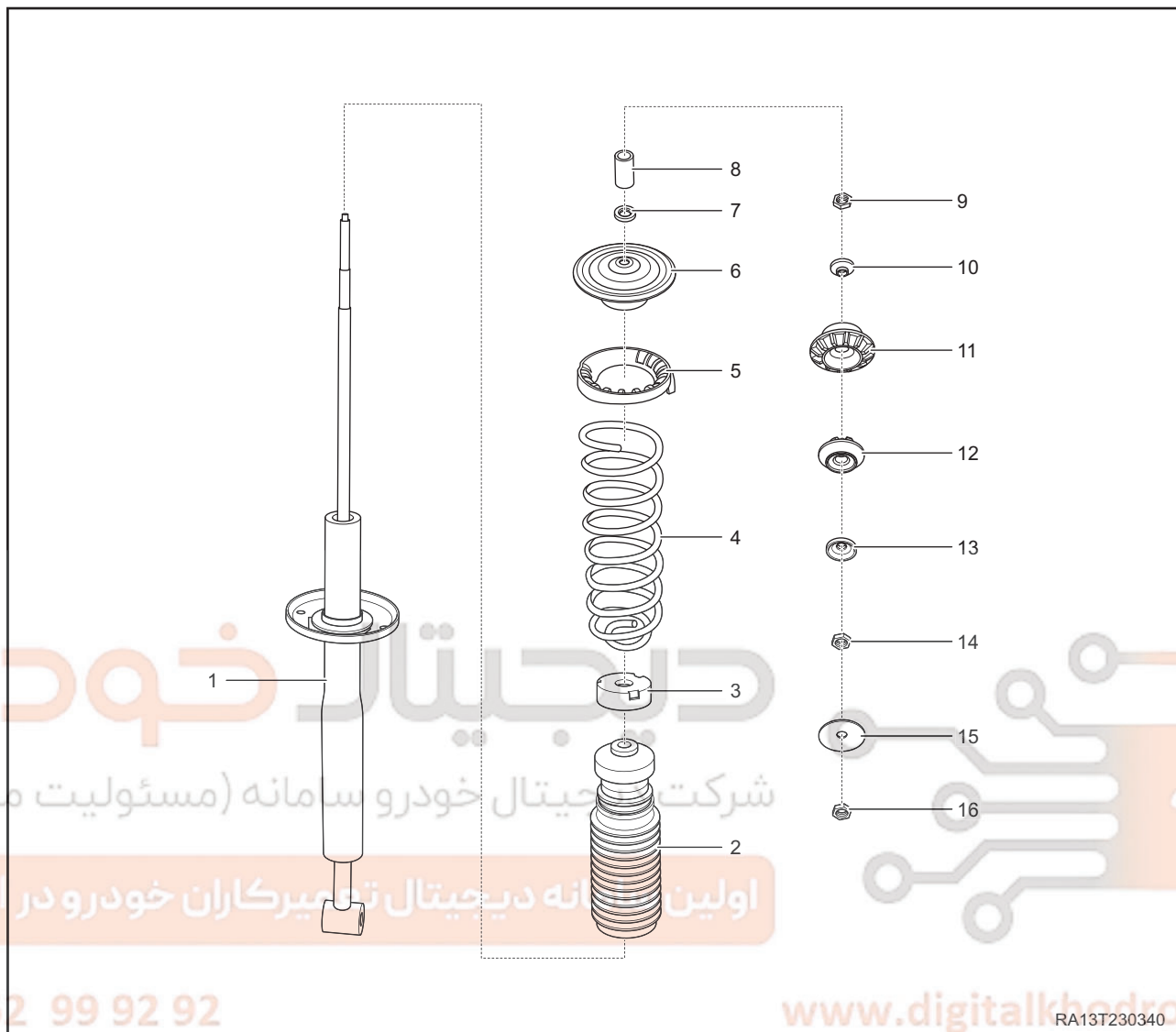
اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



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Rear Shock Absorber Assembly



1 - Rear Shock Absorber Assembly	2 - Rear Dust Boot
3 - Shock Absorber Dust Cover	4 - Rear Coil Spring
5 - Rear Spring Upper Cushion	6 - Rear Spring Upper Tray
7 - Set Ring	8 - Supporting Sleeve
9 - Nut	10 - Bowl Washer
11 - Rubber Supporting Pad II	12 - Rubber Supporting Pad I
13 - Bowl Washer	14 - Nut
11 - Rubber Bushing	12 - Rubber Bushing
13 - Front Right Control Arm Assembly	14 - Front Right Control Arm Ball Pin Assembly
15 - Dish Washer	16 - Nut

23 - SUSPENSION

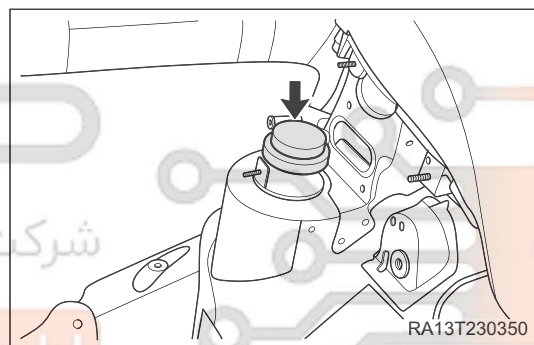
Removal

 CAUTION

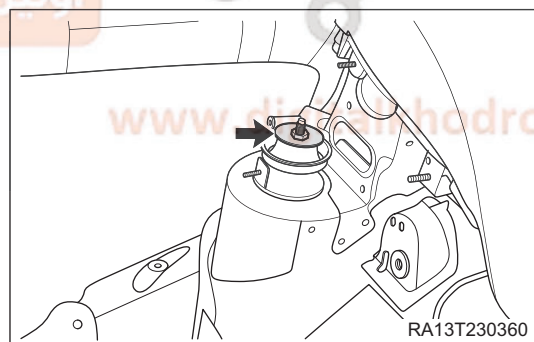
- Be sure to wear necessary safety equipment to prevent accidents.
- Make sure that safety lock of lift has been locked, when removing and installing chassis parts.
- It is not permitted to weld or modify suspension bearing parts.
- When removing and installing chassis parts, replace self-locking nuts and rusted nuts for safety.

HINT:

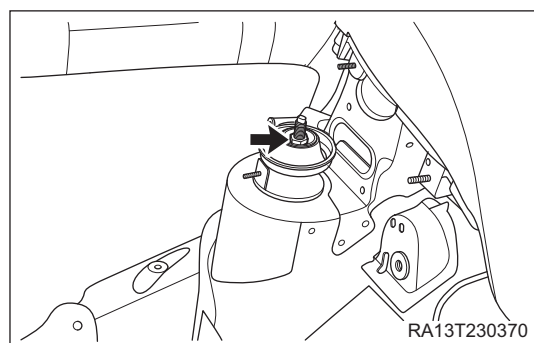
- Use same procedures for right and left sides.
 - Procedures listed below are for left side.
1. Remove the tonneau cover assembly (See page 50-13).
 2. Remove rear left speaker cover assembly from C-pillar upper protector (See page 39-37).
 3. Remove the rear left luggage compartment trim cover assembly.
 4. Remove the rear left shock absorber assembly.
 - a. Remove the rear shock absorber cover cap (arrow).



- b. Remove the pressure plate fixing bolt (arrow) from upper part of rear left shock absorber assembly.

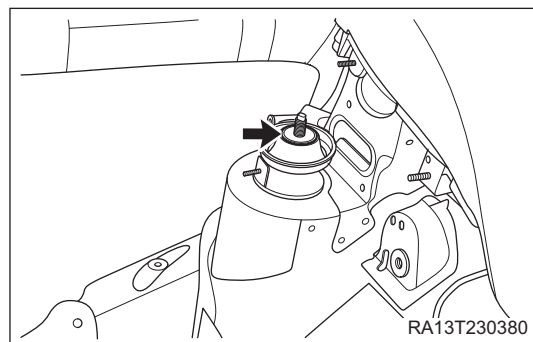


- c. Remove the rubber cushion pressure plate fixing bolt (arrow) from upper part of rear left shock absorber assembly.

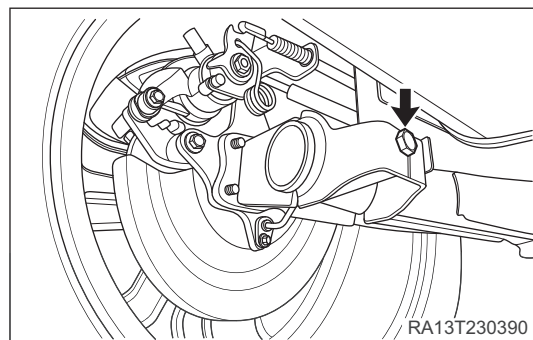


23 - SUSPENSION

- d. Remove the rubber cushion (arrow) from upper part of rear left shock absorber assembly.



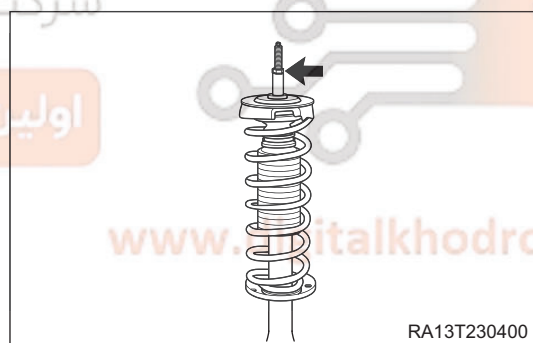
- e. Raise vehicle to an appropriate position.
- f. Remove coupling bolt (arrow) between lower part of rear left shock absorber assembly and rear left shaft assembly.
(Tightening torque: $160 \pm 10 \text{ N}\cdot\text{m}$)



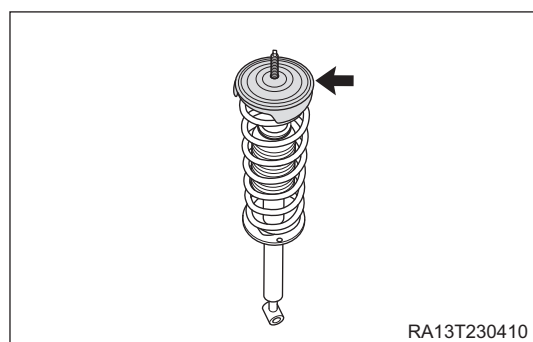
- g. Remove the rear left shock absorber assembly.

Disassembly

1. Disassemble the rear left shock absorber assembly.
- a. Remove the rear left shock absorber clamping nut (arrow).

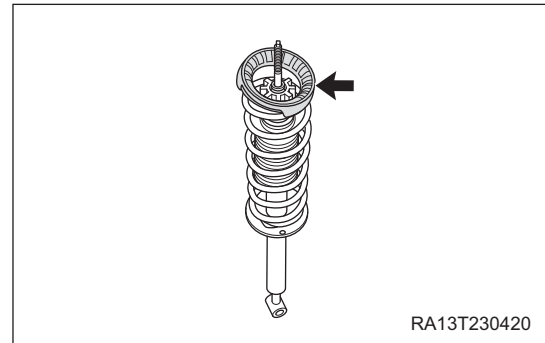


- b. Remove the rear left shock absorber spring upper tray (arrow).

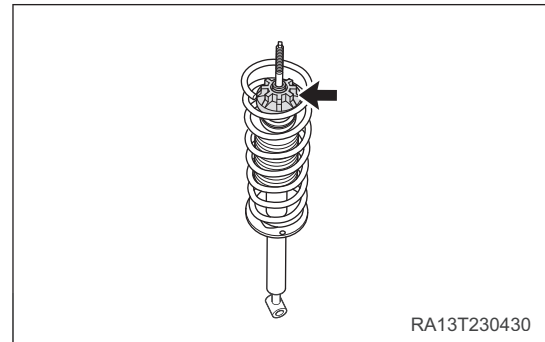


23 - SUSPENSION

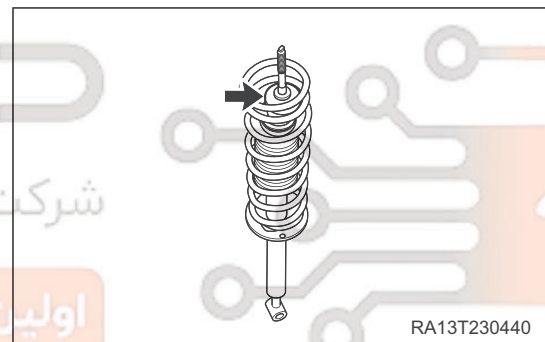
- c. Remove front spring upper cushion (arrow) from upper part of rear left shock absorber assembly.



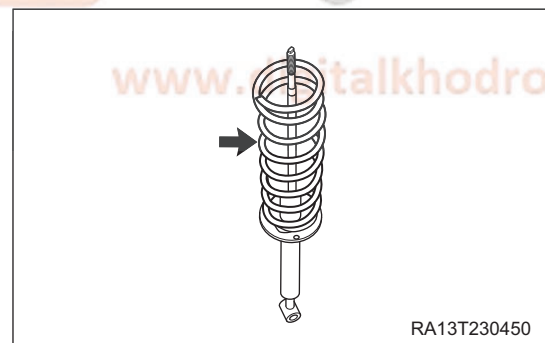
- d. Remove the rubber cushion (arrow) from rear left shock absorber assembly.



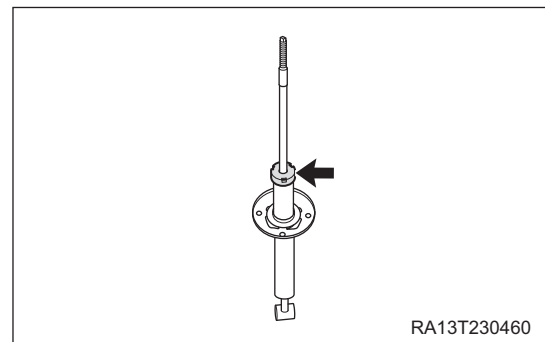
- e. Remove front dust boot and buffer block (arrow) from the upper part of rear left shock absorber assembly.



- f. Remove coil spring (arrow) from rear left shock absorber.



- g. Remove dust shim (arrow) from rear left shock absorber.

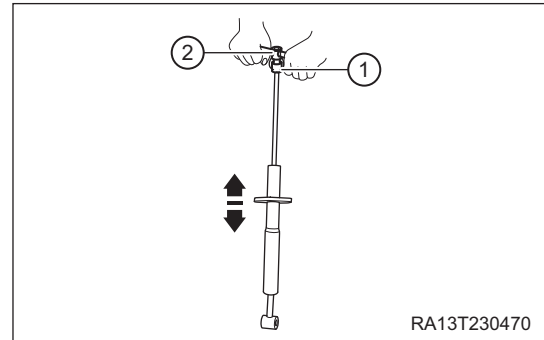


Inspection

1. Check rear shock absorber assembly

Manual check:

- Install nut (1) to upper end of rear shock absorber assembly strut, and then install T-wrench (2) or equivalent.
- Compress and extend the rear shock absorber assembly strut several times by hands in direction of arrow as shown in illustration. Check that there is no abnormal resistance or unusual sound during operation. If there is any abnormality, replace the rear shock absorber assembly with a new one.



2. Check the other components of rear shock absorber assembly.

- Check rear shock absorber cover cap, front spring upper cushion, front dust boot, front buffer block and front spring lower cushion for cracks, wear or deformation. Replace as necessary.
- Check front coil spring for wear, cracks or deformation. Replace as necessary.

Assembly

Assembly is in the reverse order of disassembly.

Installation

Installation is in the reverse order of removal.

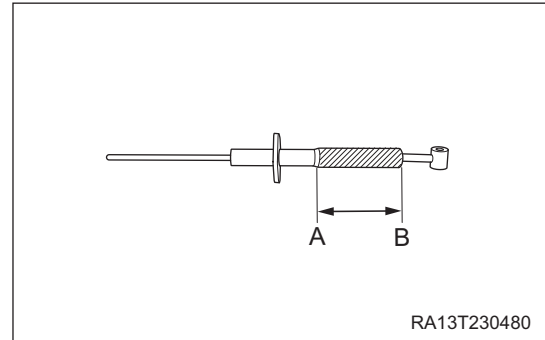
CAUTION

- Be sure to tighten coupling bolts and nuts to specified torque.
- Bounce vehicle up and down several times to stabilize rear suspension after installation.

23 - SUSPENSION

Disposal

1. Dispose the rear shock absorber assembly.
 - a. Extend the rear shock absorber assembly strut fully.
 - b. Using a drill, a hole between points A and B on the strut as shown in illustration, to discharge gas from rear shock absorber assembly.

**CAUTION**

- Be careful when drilling, because metal chips may fly about. Always perform operations with proper safety equipment to avoid personal injury.
- Gas discharged from shock absorber is colorless, odorless and nonpoisonous.

- d. After discharging gas from rear shock absorber assembly, handle the rear shock absorber assembly properly.

ENVIRONMENTAL PROTECTION

- Recycle disposed rear shock absorber assembly according to local environmental regulations.

WHEEL ALIGNMENT

Description

CAUTION

- Be sure to perform wheel alignment procedures according to operating instructions of four-wheel alignment device.
- Periodic maintenance and service for four-wheel alignment device should be performed.

In general, wheel alignment has the following 6 parameters:

1. Check the front wheel camber.
2. Check the front wheel toe-in.
3. Check the kingpin inclination.
4. Check the rear wheel camber.
5. Check the rear wheel toe-in.

If following components have been removed, installed or replaced, check and perform wheel alignment procedures:

- Front control arm assembly
- Front control arm ball pin assembly
- Front steering knuckle
- Front shock absorber assembly
- Steering gear and steering tie rod
- Drive shaft
- Front sub frame welding assembly
- Rear torsion beam welding assembly

Specifications (Standard for Four-wheel Alignment Parameters)

Item		Specified Value
Front Wheel	Front Wheel Camber	$-0^{\circ}36' \pm 30'$
	Front Wheel Toe-in	$-0.0^{\circ} \pm 3'$
	Kingpin Inclination	$12^{\circ}17' \pm 45'$
	Kingpin Caster	$4^{\circ}03' \pm 45'$
Rear Wheel	Rear Wheel Camber	$-1^{\circ}30' \pm 30'$
	Rear Wheel Toe-in	$0^{\circ}10' \pm 20'$
Sideways Sliding		$\leq 3 \text{ m/km}$

23 - SUSPENSION

Problem Symptoms Table

HINT:

Use symptoms table below to help determine cause of problem. Check each suspected area in sequence. Repair or adjust faulty components, or replace as necessary.

Symptom	Suspected Area	See Page
Vehicle pulls	Front wheel alignment (incorrect)	23-33
	Rear wheel alignment (incorrect)	23-33
Wheel shimmy	Front wheel alignment (incorrect)	23-33
	Rear wheel alignment (incorrect)	23-33
Abnormal tire wear	Tire (worn or improperly inflated)	23-33
	Front wheel alignment (incorrect)	23-33
	Rear wheel alignment (incorrect)	23-33

Inspection before Wheel Alignment

- Vehicle is in unloaded state.
- Use a lift to support and raise vehicle to a proper height.
- Check hub bearing for excessive clearance, and replace hub bearing as necessary.
- Check suspension components, steering tie rod and ball pin for wear, deformation or damage. Replace malfunctioning parts as necessary.
- Check shock absorber assembly for proper operation.
- Check if tire pressure is within specified range and adjust it to specified pressure as necessary.

Item	Front Wheel	Rear Wheel	Spare Tire
Tire (Unloaded)	220	220	250

- Check the rim and tire.
 - Visually check rim and tire for scratches, wear or damage.
 - Perform wheel dynamic balance procedures ([See page 24-10](#)).

Front Wheel Camber

Incorrect front wheel camber will cause abnormal tire wear. Check and adjust front wheel camber as necessary.

In normal conditions, it is not necessary to adjust camber after assembling the independent suspension and wheel steering knuckle. If wheel camber is not within the tolerance due to other reasons, adjust through the coupling bolt between independent suspension and steering knuckle.

Specified Value for Front Wheel Camber

Item	Specified Value
Front Wheel Camber	$-0^{\circ}36' \pm 30'$

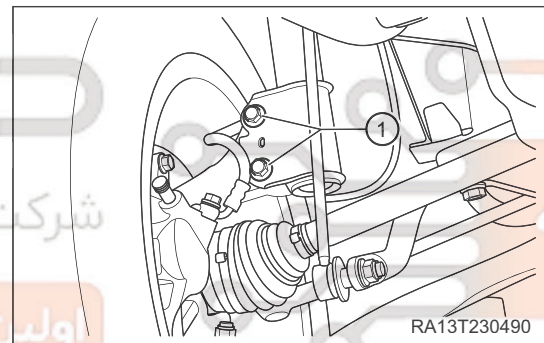
Inspection

1. Visually check driving system components for deformation and damage before adjustment. Replace deformed or damaged components as necessary.
2. Install wheel alignment device onto front wheel, and perform inspection procedures according to operating instructions for wheel alignment device.

Adjustment

1. If front wheel camber is not within the tolerance of specified value, loosen the coupling bolts (1) between front shock absorber assembly and front steering knuckle, and move wheel to adjust.
2. Tighten coupling bolts to specified torque after adjusting front wheel camber.

(Tightening torque: $110 \pm 10 \text{ N}\cdot\text{m}$)



23 - SUSPENSION

Front Wheel Toe-in

Incorrect front wheel toe-in will cause wheel pull and abnormal tire wear. Check and adjust front wheel toe-in as necessary.

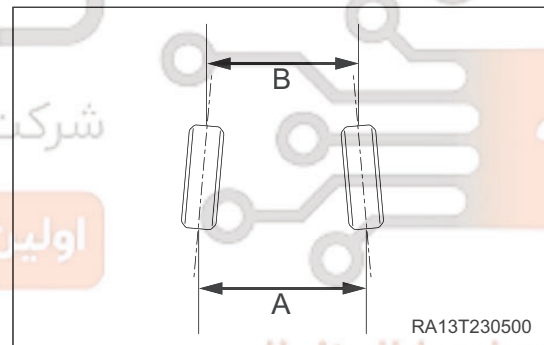
If front wheel toe-in is not within the tolerance due to other reasons, adjust the length of steering tie rod to return the toe-in to specified value.

Specified Value for Front Wheel Toe-in

Item	Specified Value
Front Wheel Toe-in	$0^{\circ} \pm 3'$

Inspection

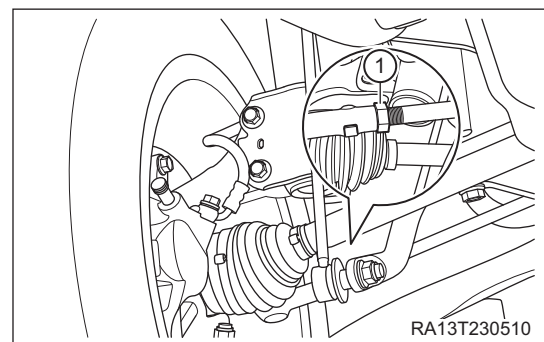
1. Perform inspection with four-wheel alignment device (perform inspection procedures referring to operating instructions for four-wheel alignment device).
2. Manual check:
 - a. Park vehicle on level ground, check if front tire pressure is within the specified range and adjust it to specified value as necessary.
 - b. Place marks on center position in front of front wheels, and measure distance A between marks with a tape measure.
 - c. Push vehicle to rotate wheels 180° , and measure distance B between marks with a tape measure when marks are turned to rear of wheels.
 - d. Calculation method: front wheel toe-in = $A - B \leq 1$ mm



Adjustment

1. Make adjusting preparation for wheel alignment according to requirement of tester.
2. Loosen steering tie rod locking nut (1), and turn tie rod to adjust length as required until front wheel toe-in reaches specified value.

(Tightening torque: 50 - 60 N·m)



3. Tighten steering tie rod locking nut and reinstall boot elastic snap ring. Check if locking nut is tightened in place and if jacket position is correct.

(Tightening torque: 50 - 60 N·m)

CAUTION

- If elasticity of boot elastic snap ring is not enough, replace it.

- After adjusting front wheel toe-in, check steering wheel for eccentricity. If necessary, loosen steering wheel locking nut and adjust steering wheel to horizontal position, and then tighten steering wheel locking nut to specified torque.

(Tightening torque: $30 \pm 3 \text{ N}\cdot\text{m}$)

Kingpin Caster & Kingpin Inclination

- Kingpin caster and kingpin inclination can only be checked by using four-wheel alignment device.
- Kingpin caster and kingpin inclination are assured by design structure and cannot be adjusted. If measured value is not within the specified range, check if other components that connect to steering knuckle are deformed or damaged. Also, check if connected part of steering knuckle is deformed or damaged. If so, replace corresponding components.

Specified Value for Front Wheel Toe-in

Item	Specified Value
Kingpin Caster	$4^{\circ}03' \pm 45'$
Kingpin Inclination	$12^{\circ}17' \pm 45'$

Rear Wheel Camber & Rear Wheel Toe-in

Rear wheel camber and rear wheel toe-in are assured by design structure and cannot be adjusted. If measured value is not within specified range, check if rear suspension components are deformed or damaged. If rear shaft assembly is deformed due to large shock, causing rear wheel alignment parameters change beyond specified range, replace rear shaft assembly.

Item	Specified Value
Rear Wheel Camber	$-1^{\circ}30' \pm 30'$
Rear Wheel Toe-in	$0^{\circ}10' \pm 20'$

- MEMO -

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