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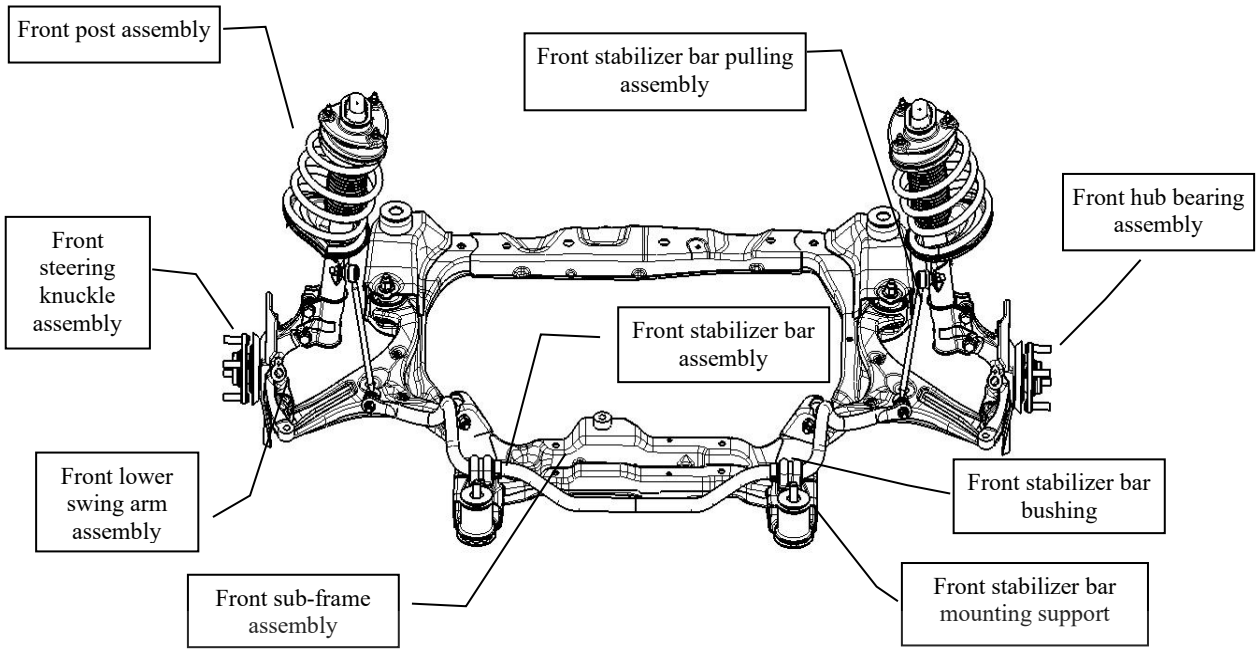
Front suspension system



Schematic Diagram of Front Suspension Assembly

Precautions

- When installing suspension or rubber bushing, it can be tightened finally only when the tires shall be on the ground, without load.
- After maintenance of suspension components, be sure to check the wheel alignment.
- Oil has to shorten service life of rubber bushing. The flowed oil must be wiped away.
- Idle condition means that fuel, engine coolant and lubricant has been filled, spare tire, jack, driver's tool and foot pad are at specified position.
- Do not reuse lock nut. Always use a new nut when installing. When replacing, before tightening lock nut, do not wipe anti-rusting oil from lock nut.

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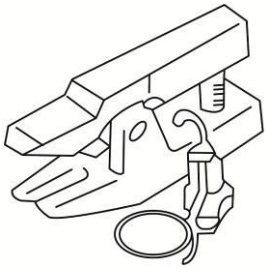
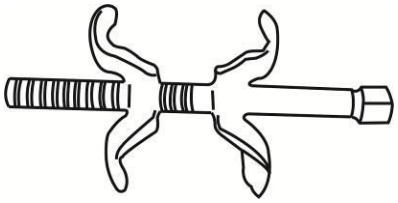
Preparation work

Special tools to be used are shown in following table:

Special Tool Table

No.	Tools	Overall Diagram	Code	Instructions
1	Move drawplate of drive link.		JAC-T1D003	Removal of connected bulb
2	Removal machine of damping spring		JAC-T1D004	Removal and installation of damping spring

Front suspension assembly

1. Inspection in the car

Confirm whether each component is fixed (clearance) and worn properly and normally.

1) Check clearance of track rod

① Park the front wheel straight ahead.

② Place a crowbar (or similar tools) between track rod and knuckle.

③ Lever to check the clearance.

Caution:

■ Do not destroy dust cover of bulb.

■ Do not use excessive force to destroy the assembly part.

2) Inspection of shock absorber

Check if the assembly part is leaking, destroyed or worn-out.

2. Front wheel alignment check

1) Specification

Measure the wheel alignment in idle load.

2) Pre-inspection

Check the following item:

① Check if the tire pressure is normal and tire is worn-out.

② Check if the wheel jumps.

③ The clearance of wheel bearing.

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④ The clearance of track rod.

⑤ Check if the fixed points of axle and suspension are loose or out of shape.

⑥ Check if each suspending part, steering knuckle, shock absorber and tie rod are cracked, deformed or damaged.

⑦ The height of vehicle body.

3. Check the toe-in of the front wheel

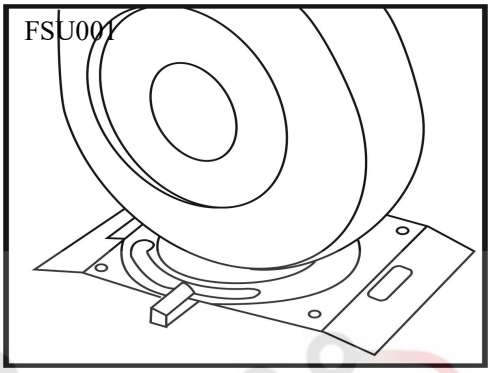
Caution:

- Locate the wheel in level and idle condition.
- The toe-in value of the front wheel: 0°±10′

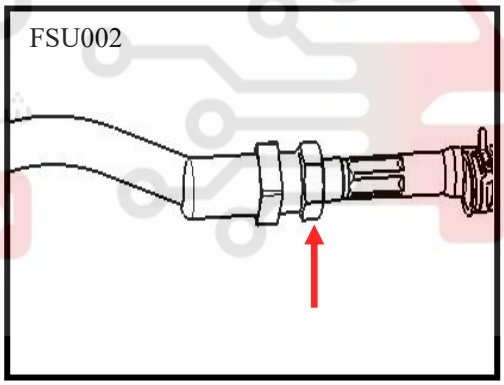
If the above value is not within the standard, please adjust according to the following steps:

1) Check the above value on the four-wheel aligner.

2) Adjust and fix the steering wheel.



3) Loose the locknut at the end of track rod.



4) Rotate the left/right tie rod in clockwise/counter clockwise, and adjust the value of toe-in to the standard value.

Caution:

- The amount of rotating the tie rod shall be proper.

5) Lock the locknut at the end of track rod.

4. Check camber angle, rear caster angle and kingpin inclination.

Front-wheel camber: 0°±30′

Rear caster angle: 4°±30′

Kingpin inclination angle: 13°±30′

Caution:

- Camber angle, caster angle and toe-in angle of main pin are set before leaving factory, so do not adjust them.
- If camber angle, kingpin caster angle and kingpin inclination angle are out of standard range, please check if front suspension, steering knuckle, shock absorber and tie rod are worn or damaged. If any, replace any suspected components.

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Front shock absorber

1. Components

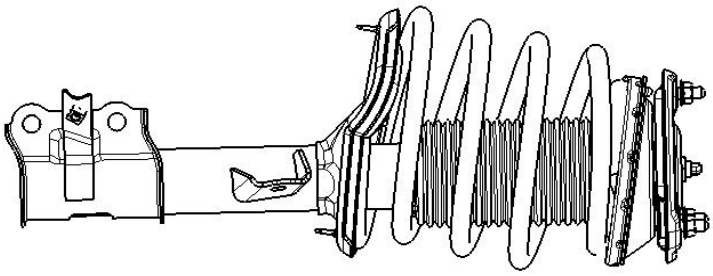


Diagram of Front Shock Absorber Assembly

2. Removal and installation

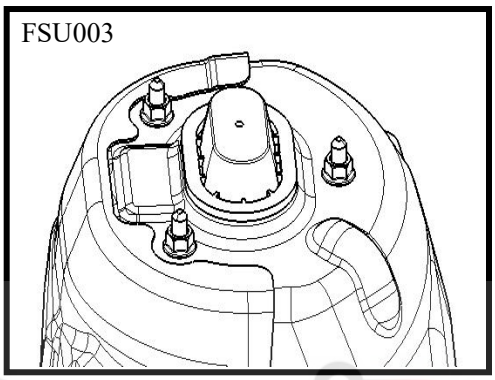
1) Removal

① Remove the front tire.

② Disconnect the connector of wheel speed sensor.

Caution:

■ Do not pull the wire harness of wheel speed sensor.



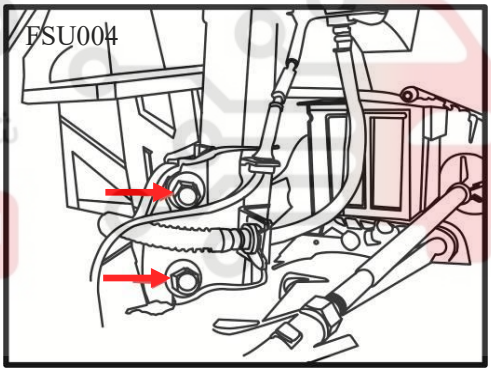
③ Remove flexible brake hose card and cut off flexible brake hose.

④ Remove self-locking nut of shock absorber and body.

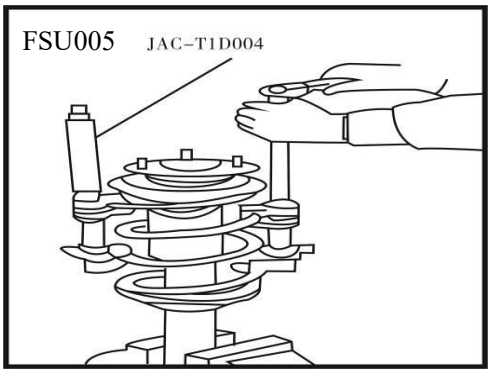
■ Tightening torque: 21 -25 N•m

⑤ Remove set bolts and nuts of absorber and steering knuckle.

■ Tightening torque: 110-130 N•m



⑥ Take out shock absorber assembly.



2) Installation

Install it in the reverse order of removal

Caution:

■ Do not use any damaged part.

■ Under idle condition, completely tighten each part removed at the time of dismantling shock absorber.

■ Check the wheel alignment.

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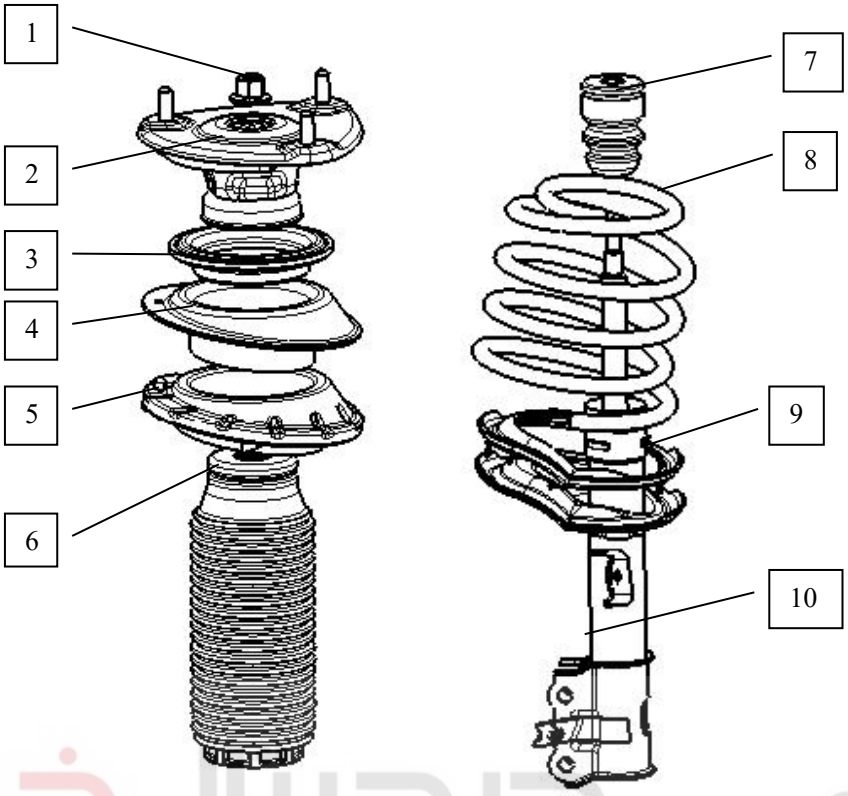
3. Disassembly and assembly

1) Components



Front shock absorber stand column assembly exploded view

1-Self-locking nut 2-Upper support assembly 3-Plane bearing
4- Upper support saddle of the coil spring 5-Coil spring upper vibration isolation cushion
6-Dustproof cover 7-Shock absorber buffer block 8-Front coil spring
9-Coil spring lower vibration isolation cushion 10-Front shock absorber body

2) Disassembly

Caution:

■ Do not destroy piston push rod of shock absorber when removing components of shock absorber

① Use spring compressor to compress coil spring until it is loose completely.

Caution:

■ Confirm the compressor is installed in the right position, and then compress coil spring.

■ When tightening spring compressor bolts, do not use pneumatic tools.

③ Fix the end of piston push rod and remove the locknut of piston push rod.

■ Tightening torque: 49-68.6 N•m

Caution:

■ Confirm compressed coil spring is slack.

④ Remove upper support saddle, vibration cushion of the coil spring, dust helmet and buffer block.

⑤ Remove coil spring with a compressor, and then release the compressor slowly.

⑥ Remove down vibration cushion of the coil spring and remove the shock absorber.

3) Inspection after disassembly

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① Shock absorber

Caution:

- Whether the shock absorber has deformation, crack and damage. Replace it if any.
- Check the piston push rod for damage, wear and deformation. Replace it if any of the above.
- Check the piston for oil leakage. Replace it if any.

② Vibration cushion of the coil spring, buffer block and dust helmet.

Check if there is crackle and if the rubber components are worn-out. Replace it if any.

③ Coil spring

Check the coil spring for crack, wear and damage. Replace it if any.

④ Upper support saddle of the coil spring

Check for cracks, wear, deformation and other damage. Replace it if any.

⑤ Plane bearing

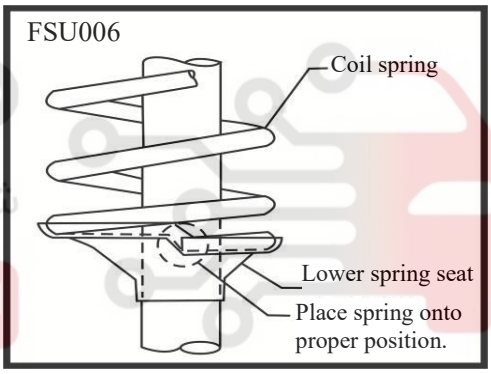
Check for cracks, wear, deformation and other damage. Replace it if any.

⑥ Upper support assembly

Check for cracks, wear, deformation and other damage. Replace it if any.

4) Assembly

Installation is in the reverse order of removal.



Caution:

- Do not destroy the piston push rod when assembling the components on shock absorber.
- Adown the larger diameter end and direct down support saddle of the spring.
- Be sure that compressor has assembled on the coil spring before pressing coil spring.
- Before releasing compressor, check if the mounting position of the coil spring is correct.
- Check if the auxiliary aiming mark is correct.

Lower swing arm

Removal and installation:

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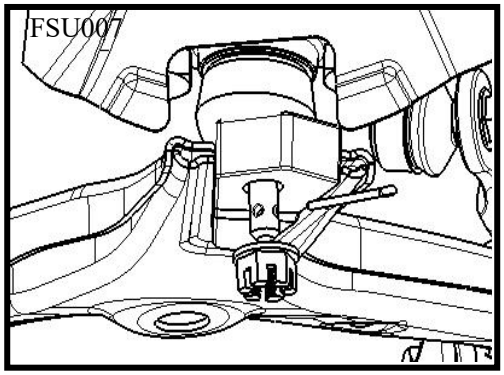

1) Removal

① Lift the vehicle and remove the wheel tire.

② Unplug cotter pin, and dismantle slot type nut fixing lower swing arm ball pin and lower swing arm.

■ Tightening torque: 100-120 N•m

③ Unscrew off the fixing screws of lower swing arm and sub-frame rear point.

■ Tightening torque: 100 -120 N•m

④ Dismantle fixing bolt of rear fixing point of lower swing arm and auxiliary frame.

■ Tightening torque: 170-190 N•m

Caution: fix the lower swing arm ball joint and then unscrew the locking nut to avoid rotation during removal.

⑤ Remove the lower swing arm assembly.

2) Inspection after disassembly

① Visual inspection

■ Check the bushing for wear or damage. Replace it if any.

■ Check if rear swing arm is deformed or destroyed. Replace it if any.

■ Check if dust cover of bulb or down swing arm cracks. Replace it if any.

■ Check all the set bolt and nut. Replace it if any damage.

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3) Installation

Install it in the reverse order of removal

Caution:

- Do not use any damaged part.
- Pre-tighten the bolt between front rubber sleeve of lower swing arm and set bracket to avoid the rubber sleeve from deforming.
- Under idle condition, tighten each part removed at the time of dismantling lower swing arm.
- Check the wheel alignment.

Lateral stabilizer bar

Removal and installation:

1) Removal

① Disassemble the fixing nut of front left & right stabilizer bar link connecting ball and front pillar assembly.

- Tightening torque: 55-65 N•m

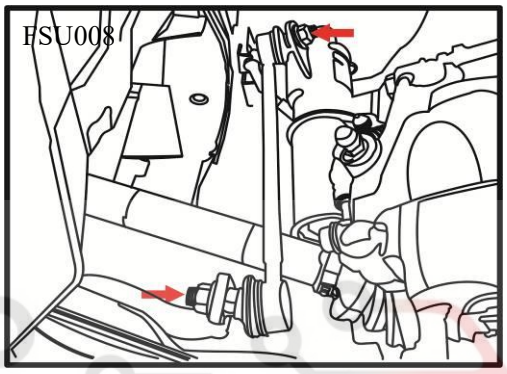
② Disassemble the fixing nut on front left & right stabilizer bar link connecting ball and front stabilizer bar assembly.

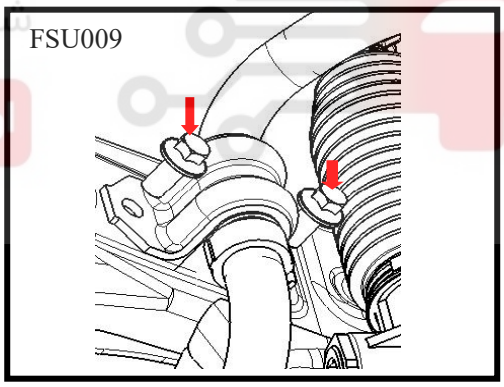
- Tightening torque: 55-65 N•m

③ Remove the set screw bolt of left and right stabilizer rod and dissemble fixed frame and bush.

- Tightening torque: 45-55 N•m

④ Remove the stabilizer rod assembly.





2) Inspection after disassembly

Check if stabilizer bar, connection ball of stabilizer bar, support structure of stabilizer bar and stabilizer bar bushing are deformed and worn. Replace it if any.

- Move the bulb stud manually to see if it is flexible.
- Check if the dustproof shield of stabilizer rod has crack and grease leakage. Replace it if any.

3) Installation

- Install it according to the reverse order of dismantling.
- When tightening lock nut, first fix bolts of horizontal stabilizer rod and avoid rotating it.

Caution:

- Do not reuse non-reusable components.
- When assembling bush and fixed frame of stabilizer rod, note the direction.
- Under idle condition, tighten each part removed at the time of removing front stabilizer rod.

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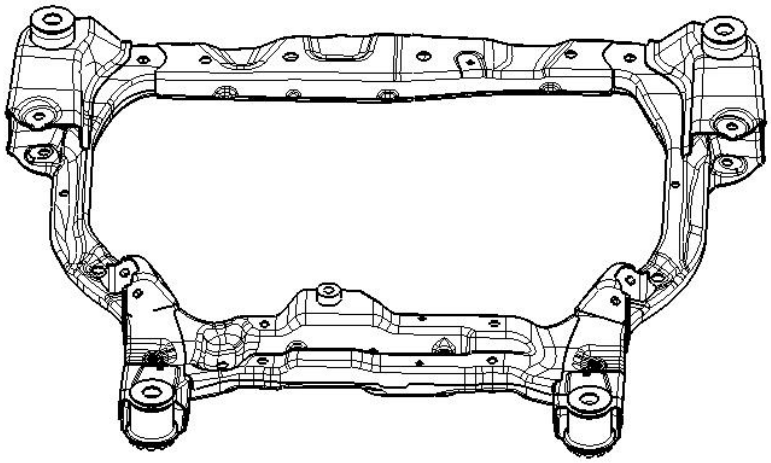
Front sub-frame assembly

1. Components



Front sub-frame component diagram

2. Removal and installation

1) Removal

① Lift the vehicle and remove the tires.

② Disassemble the steering column assembly and steering shaft U-joint screws.

③ Unscrew off the fixing bolts of engine rear mounting with the front sub-frame.

④ Fixing bolts of sub-frame with front vehicle body point.

■ Tightening torque: 170-190 N•m

⑤ Fixing bolts of sub-frame with rear vehicle body point.

■ Tightening torque: 170-190 N•m

Take down front sub-frame assembly.

2) Inspection after disassembly

■ Check if sub-frame has clack

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Fault diagnosis

Table of Common Failure Diagnosis

Fault Symptoms	Fault Possible Cause	Countermeasures
Steering heaviness	Wheel alignment is improper	Adjust
	Rotation beyond the ball joint of lower arm	Replace
	Tire pressure is too low	Inflation
	W/O power steering	Repair or replace
Return is poor	Wheel alignment is improper	Adjust
	The absorber is faulty.	Repair or replace
	Wear or damage to stabilizer bar	Replace
	Coil spring is worn-out or destroyed.	Replace
	Worn lower swing arm bushing	Replace
The tire is worn out abnormally.	Wheel alignment is improper	Adjust
	The air pressure is lower or higher.	Adjust the air pressure
	The absorber is faulty.	Repair or replace
Vehicle deviation	Wheel alignment is improper	Adjust
	Lack of resistance for bulb connection of down swing arm.	Replace
	Bush of down lower swing arm loose or worn-out.	Replace
The vehicle runs biased to a single side	Wheel alignment is improper	Adjust
	Lack of resistance for bulb connection of down swing arm.	Replace
	lower swing arm is bent	Replace
	Coil spring is worn-out or destroyed.	Replace
Steered wheel vibration	Wheel alignment is improper	Adjust
	Lack of resistance for bulb connection of down swing arm.	Replace
	Bush of down lower swing arm loose or worn-out.	Replace
	The absorber is faulty.	Repair or replace
	Wear or damage to stabilizer bar	Replace
	Coil spring is worn-out or destroyed.	Replace
Vehicle declines.	Coil spring is worn-out or destroyed.	Replace
	The absorber is faulty.	Repair or replace

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Maintenance data and specification

Technical Specification Table

Items			Parameter and Specification	
Front suspension from			Coil spring with independent suspension in Mac Pherson style.	
Shock absorber	Type		Two-way hydraulic drum	
	Stroke		168 mm	
	Damping force	Stretch	1115 N ± 165 N (0.3 m/s)	
		Compression	355 N ± 77 N (0.3 m/s)	
Coil spring			Free height: 329±5 mm	Color mark: a white line with a yellow line.
Wheel alignment	Toe in (Front)		0°±10′	
	Camber angle of wheel		0°±30′	
	Inner caster angle		13°±30′	
	Rear caster angle		4°±30′	
	Kingpin offset		9.7mm	

Fastening torque table

Item	Torque (N·m)
Fixing bolt of front lateral stabilizer bar mounting support and sub-frame	45-55
Front lateral stabilizer bar and lateral stabilizer bar pulling rod connecting nut	55-65
Connecting nut of front lateral stabilizer bar pulling rod and front post assembly	55-65
Nut of front shock absorber and body assembly	21-25
Front shock absorber upper self-locking nut	49-68.6
Front shock absorber and steering knuckle connecting bolt	100-120
Lower swing arm ball pin and steering knuckle connecting bolt	100-120
Lower swing arm ball pin and lower swing arm connecting nut	100-120
Lower swing arm front bushing and sub-frame connecting bolt	170-190
Lower swing arm rear bushing and sub-frame connecting bolt	100-120
Front sub-frame front fixing nut	170-190
Front sub-frame rear fixing bolt	170-190

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Rear Suspension System

Notes

■ The final tightening must be carried out under tire grounding and no-load conditions when installing the suspension.

■ It is necessary to check the wheel alignment after repairing the suspension components.

■ The final tightening must be carried out under tire grounding and no-load conditions when installing the rubber bushing.

■ The oil will shorten the service life of rubber bushing. It is necessary to wipe the spilled oil.

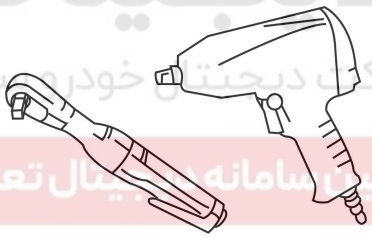
■ The no-load condition means that the fuel, engine coolant and lubricating agent have been filled normally and the spare tires, jacks, tools and foot pads are placed in the designated position.

■ The lock nut is not reusable. Always use the new bolt during installation. Please do not wipe the anti-rust oil on the lock nut before tightening up the lock nut during replacement.

Preparation Work

Common and special repair tools used are shown in the diagram

Common Tool List

No.	Tool	Outside View	Instructions
1	Power Tool		Installation and removal of bolts and nuts

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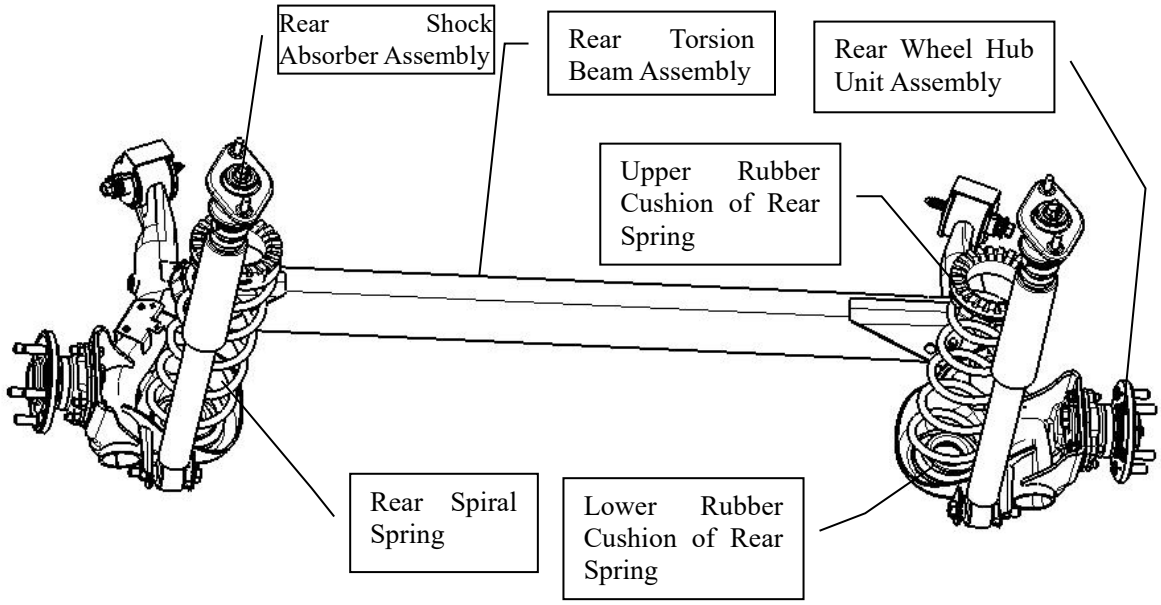
Rear Suspension System



Component Diagram of Rear Suspension Assembly

Inspection on the vehicle:

Confirm the fixing condition of each component (clearance, looseness)and component condition(wear, damage).

Check the installation position of shock absorber for oil leakage or damage.

Rear Wheel Alignment Inspection:

Attention:

■ The front toe-in angle has been pre-set at the factory and can not be adjusted.

■ After the relevant components of rear suspension have been worn or changed, check whether the location parameters of rear wheel meet the requirements or not.

If there is a difference between them, please replace the deformed and worn parts.

■Standard Value:

Rear Wheel Total Toe-In 24'±24'

Rear Wheel Unilateral Toe-In 12'±12'

Rear Wheel Camber Angle：-1′±30′

1)Instructions

Check the wheel alignment when the vehicle is under no-load condition.

2）Pre-Check

Check the following items:

① Check the tire pressure for standard value, check the tire for wear.

② Check the tire for runout.

③ Check the wheel bearing shaft for end clearance

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④ Check each component clearance of suspension and each fixed point for looseness.

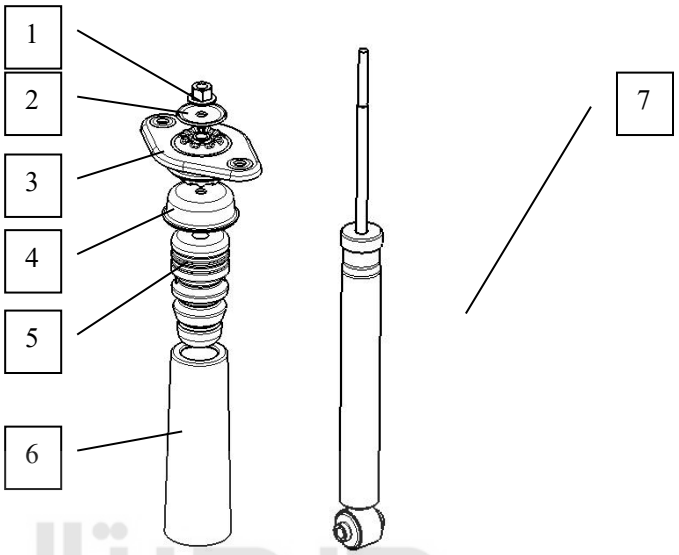
⑤ Check the shock absorber for maneuvering capability

⑥ Check the cantilever for crack, deformation and other damage.

⑦ Check the height of vehicle body.

Rear Shock Absorber

Component:



Component Diagram of Rear Shock Absorber Assembly

1-Self-locking nut 2-Install the vibration isolation pressure pad 3- and then lower the mounting plate 4-limit seat 5-buffer block 6-dust cover 7-rear damper body

Removal and Installation:

1）Removal

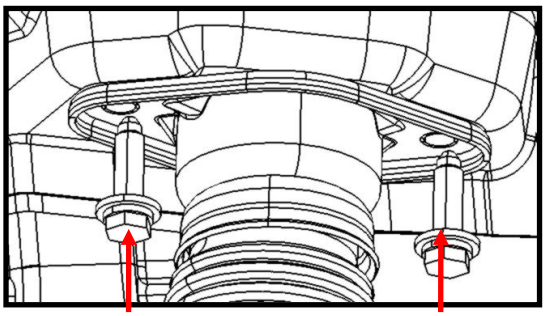
① Lift the vehicle and remove the wheel tires.

② Remove the connecting bolts between shock absorber and body.

■ Tightening Torque:45 N·m～55N·m

③ Remove the shock absorber and rear torsion beam.

■ Tightening Torque:100 N·m ～120N·m



2)Inspection After Removal

① Shock Absorber

■ Check the shock absorber for oil leakage. If any, please replace it.

■ Check the piston push rod for damage,wear or deformation If any, please replace it.

② Bumper Block, Dust-Proof Boot

■ Check the bumper block and dust-proof boot for wear or damage. If any, please replace it.

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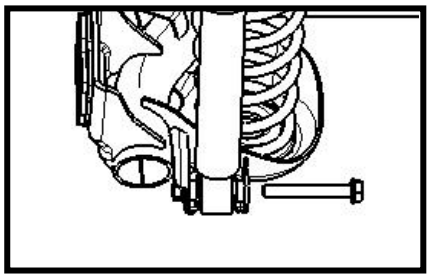

③ Upper Mounting Plate of Rear Shock Absorber

■ Check the upper mounting plate of rear shock absorber for wear or damage. If any, please replace it.

④ Position-Limiting Seat,Vibration Isolation Pressure Pad of Upper Mounting Plate

■ Check the position-limiting seat and vibration isolation pressure pad of upper mounting plate fir wear or damage. If any, please replace it.

3)Installation

Install in the reverse order of removal.

Note:

■ Please do not use the damaged parts.

■ Conduct the final tightening of each component removed from the disassembled shock absorber under no-load condition.

■ Check the wheel alignment

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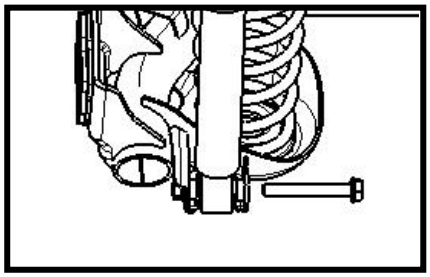
Rear Spiral Spring

1)Removal

① Remove the connecting bolt between rear shock absorber and rear torsion beam.

■ Tightening Torque:100 N·m ～120N·m



② Remove the upper rubber cushion of rear spring,rear spiral spring and lower rubber cushion of rear spring.

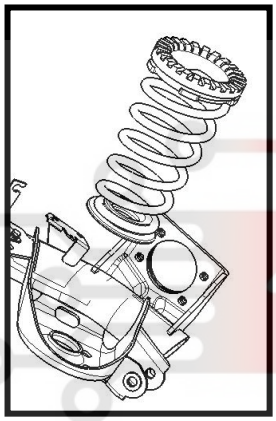
Note:

Pay attention to the sudden spring drop during removal to avoid personal injury!

2)Inspection After Removal

① Upper Rubber Pad of Rear Spring, Lower Rubber Pad of Rear Spring

■ Check the upper and lower cushion of rear spring for Wear or damage If any, please replace it.



② Spiral Spring

■ Check the spiral spring for wear or damage. Replace it if necessary.

3)Installation

Install in the reverse order of removal.

Attention:

■ Please do not use the damaged parts.

■ When installing the spring lower cushion, the rubber cylinder of lower cushion must be aligned with corresponding spring plate hole on the rear torsion beam and installed in right place.

■ The large diameter end of spiral spring towards the downside and aligns with spring bottom plate.

■ Whether the assembly mark is correct or not.

■ Conduct the final tightening of each component in condition of no-load

■ Check the wheel alignment.

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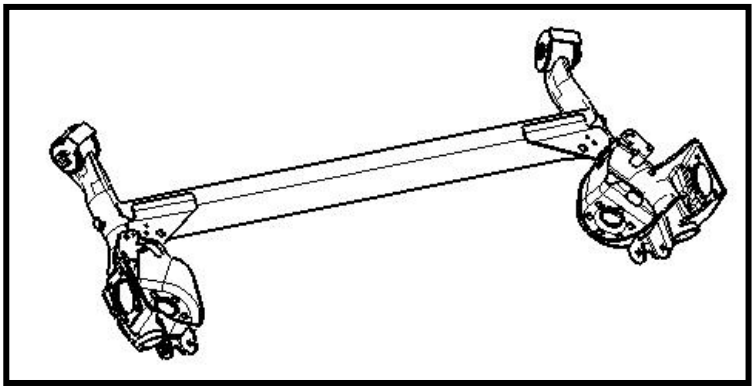
Rear Torsion Beam Assembly



Component Diagram of Rear Torsion Beam

Removal and Installation:

1)Removal

① Remove the connecting bolt between the rear torsion beam and shock absorber.

■ Tightening Torque: 100 N·m～120N·m

② Support the rear torsion beam assembly with jack

Note:

■ It is not allowed to let the jack slip off

During disassembly

③ Remove the fixed bolt between rear torsion beam and body.

■ Tightening Torque: 140 N·m～160N·m

2)Installation

Install in the reverse order of removal.

Note:

■ Please do not use the damaged parts.

Malfunction Diagnosis

Common Malfunction Diagnosis Table

Malfunction Symptom	Possible Cause of Malfunction	Countermeasures
Abnormal sound	Loose assembly	Tightening
	Wheel Bearing Fatigue or Damage	Replacement
	Shock Absorber Assembly Damage	Replace the damaged parts
	Tire Quality Defect	Replacement
Vibration	Tire pressure over foot	Pressure Adjustment
	Shock Absorber Assembly Damage	Replace the damaged parts
	Tire Nut Looseness	Tightening
	The spiral spring gets shorter or broken	Replacement
	Tire Quality Defect	Replacement
Body Tilt	The coil spring becomes short or broken	Replacement

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Repair Data and Specifications

Technical Specification Table

Project			Parameter and Specification
Rear Suspension Form			Torsion Beam Type
Shock Absorber	Type		Two-way hydraulic cylinder
	Stroke		223mm
	Damping Force	Stretch	440N±77N（0.3m/s）
		Compression	228N±56N（0.3m/s）
Spiral Spring	Type		Helical Spring
	Free Height		365mm（Reference）
	Color Mark		The same color on both sides
wheel alignment	Wheel Total Front Toe-In(Rear)		24'±24'
	Camber Angle		-1°±30′

Tightening Torque Table

Project	Tightening Torque(N·m)
Rear Shock Absorber and Body Assembling Bolt	45～55
Self-Locking Nut On Rear Shock Absorber	24.5～34.3
Rear Shock Absorber and Rear Torsion Beam Connecting Bolt	100～120
Bolt Connection with Rear hub and Torsion Beam	65～75
Rear Torsion Beam and Body Assembling Bolt	140～160

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