

Maintenance Manual of Chery A113

(Chassis)

Chery Automobile Co., Ltd

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Chapter 1 Brake System

I. System Checking Parameters

1. Check brake disc:

The friction surface of brake disc should be flat and has no apparent grooves; otherwise, brake disc should be replaced.

2. Thickness checking

The standard thickness of front disc (ventilation disc) is 17 mm with its operating limit of 15 mm; when exceeding the operating limit, the front disc should be replaced.

3. Checking of brake friction lining thickness

Standard thickness of front brake lining shall be 10 mm, application limit shall be 1 mm, and the remaining thickness of limit brake pad thickness shall be not less than 1mm.

Standard thickness of rear brake lining shall be 5 mm, application limit shall be 1 mm, and the remaining thickness of limit brake pad thickness shall be not less than 1 mm.

4. Checking of brake disc run-out

Use dial gauge to check the face runout of brake disk, the application limit of front disk shall be 0.03mm, the application limit of rear disk shall be 0.03mm, otherwise replace it.

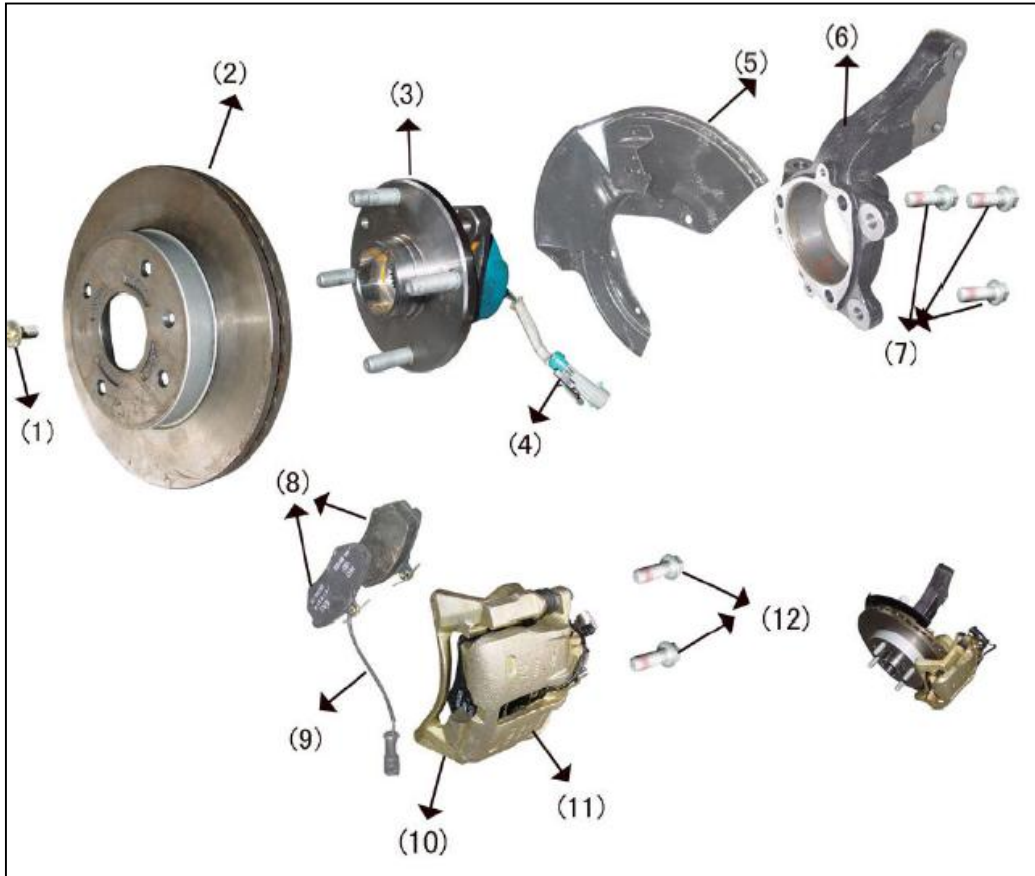
Important notice:

After completion of replacing friction lining or brake disk, apply the brake for several times to enable breaking-in between brake lining and brake disk. Always ensure safety!

After replacing brake lining, check brake fluid level to ensure it is between MIN and MAX.

II. Removal/Installation and Overhaul of Front Brake and Brake Calliper

1. System Structural Diagram



Structural Diagram of Front Brake Assembly

- (1) Brake disc positioning bolt
- (3) Wheel hub bearing unit;
- (5) Dust cover
- (7) Fixing bolt
- (9) Friction lining thickness sensor plug
- (11) Brake calliper assembly

- (2) Brake disc
- (4) ABS speed sensor plug
- (6) Steering joint
- (8) Friction lining
- (10) Brake bracket
- (12) Fixing bolt

2. Preparations

Tools: Ratchet wheel, ratchet lever, 13#, 14#, 16#, 18#, 19#, 8#, 30# socket, 10#, 13#, 14#, 16# ring wrench, vice, torque wrench, measure ruler..

Accessories: brake fluid

3. Notices

3.1 Please wear necessary labor protection supplies to avoid accidents.

3.2 The brake liquid is one toxic liquid. In event of contact with the skin or eyes due to carelessness, flush with a great amount of water and if necessary call for medical treatment timely.

3.3 The scrapped brake liquid should be accommodated in the container. It's prohibited to drain it into the sewage system or stack with other household garbage.

3.4 Do not depress the brake pedal nor move the vehicle during the removal/installation operation.

3.5 Do not make the friction lining or brake disc come contact with the oil substances, which will impair the braking effects.

4. Removal and Overhaul

4.1 Remove the protective cover from the tire rim with slotted screwdriver.



4.2 Remove the tire fixing nuts with 19# torque wrench or vehicle attached tool and remove the tire.
Torque: 110 ± 10 Nm.



4.3 Lift the vehicle with elevator.

4.4 Remove the 2 nuts (upper and lower) from the brake calliper and steering joint with 18# wrench.



4.5 Remove the nuts from brake hose with 13# wrench.

Notice: The brake liquid is one toxic liquid. Do not splash the brake liquid to the clothes or skin during the removal of the brake hose.

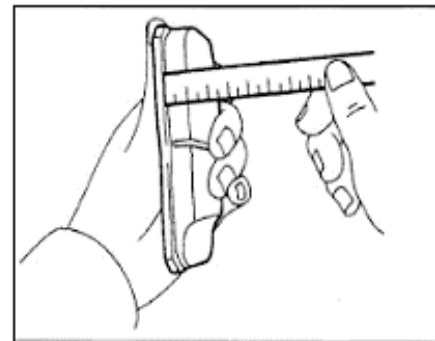
Torque: 16 ± 3 Nm.



4.6 Pull out the brake disc with hand.



4.7 Measure the thickness of friction lining. If below 3mm, replace timely in pairs.

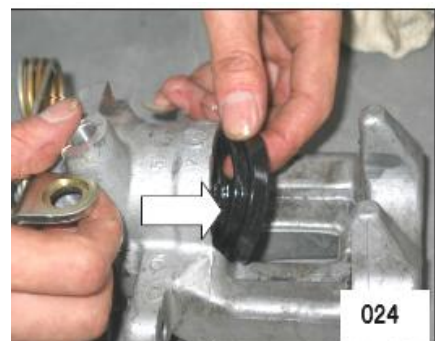


4.8 Remove the brake calliper and brake pump with 14# wrench.



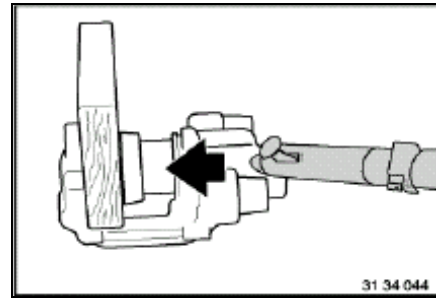
4.9 Remove the dustproof seal and check for the damage of the dustproof seal. If necessary, renew the dustproof seal. Clean the contact surface of the brake piston and apply with one film of silencing grease.

Notice: It's prohibited to make the dustproof seal come contact with the silencing grease, which will cause the swelling of the dustproof seal.

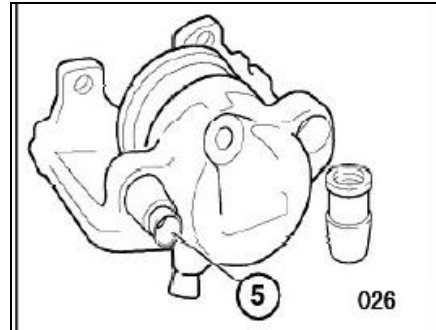


4.10 Remove the piston. Prepare one wood board to hold the piston and place the wood board between the piston and the wall of the brake calliper. Press out the piston with the compressed air carefully through the connecting bore. Place the guard plate (such as hard wood) at the notch of the brake calliper to protect the piston.

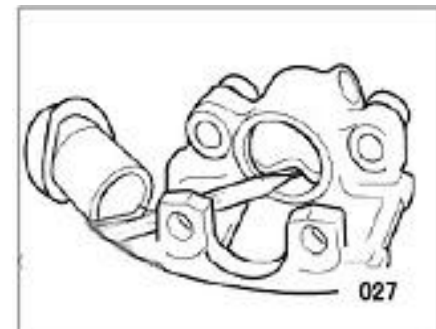
Notice: Do not hold the piston with fingers – danger of clamping! The brake calliper piston is prohibited from removal at will and should be removed/installed only by professionals or under the guidance of the professionals.



4.11 Check the guide sleeve. The guide sleeve should move smoothly and freely when pushed with hand. Replace the guide sleeve in event of jamming or stiffness. Notice: Apply the lubricating grease onto the guide sleeve during assembling.



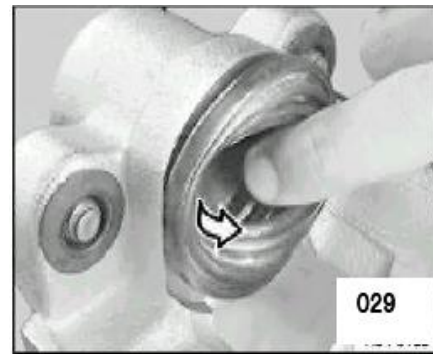
4.12 Remove the seal ring carefully with the plastic needle, clean the brake cylinder and components with alcohol and blow dry with compressed air. Carefully check the surfaces of brake cylinder, piston, and flange. It's prohibited to conduct the machining process on the brake cylinder and piston.



4.3 Installation of brake branch pump: Apply one film of brake cylinder cream onto the cylinder body, plunger, and seal sleeve. Attach the seal ring onto the circular groove at the rear of the brake cylinder. Attach the dustproof seal ring onto the front circular groove and press it in completely.

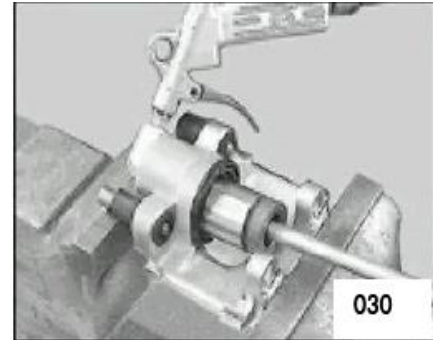


4.14 The area between the dustproof seal ring and the brake clamp housing must be kept dry. It should be kept away from the brake cylinder cream or the brake liquid, in order to ensure the correct position of dustproof seal ring.

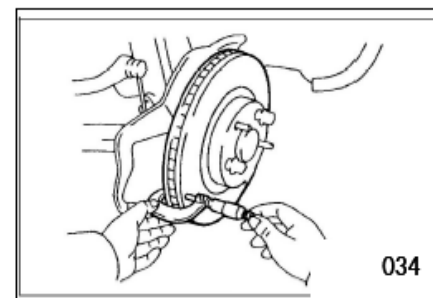


4.15 Secure the brake piston with the reinforcement parts available in market and press it onto the dustproof seal ring slightly. Blow the dustproof seal ring with compressed air (up to 3.0bar) to attach the piston ring onto the piston.

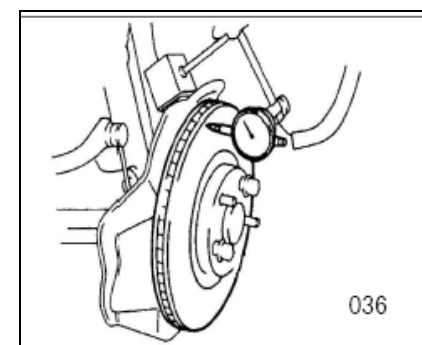
Notice: Dip the dustproof seal ring and piston with brake liquid to facilitate the passing of the seal ring.



4.16 (Checking of brake disc) Check the thickness of brake disc. Replace the brake disc if the thickness is less than the min thickness. Notice: The two brake discs at the same axle should be replaced at a time. The friction linings must be replaced following the replacement of the brake discs.



4.17 Check the max run-out of the end surface of brake disc with dial gage. If above 0.03mm, replace it. (Provided that the brake disc thickness is guaranteed, it may conduct the proper machining to meet with the max run-out.)



4.18 Installation of other portions with reference to the Removal Procedure.

III. Removal/Installation and Overhaul of Rear Brake

1. System Structural Diagram



- | | |
|-------------------------------------|-----------------------------------|
| 1. Rear brake assembly | 2. Brake drum |
| 3. Rear wheel hub bearing assembly | 4. Oil seal |
| 5. End cap | 6. Bolt |
| 7. Rear wheel sensor | 8. Rear brake hose retaining clip |
| 9. Dual-port pipe clip | 10. Tie rod |
| 11. Rear shoe pressure spring plate | 12. Rear shoe pressure spring |

2. Preparations

Tools:

Ratchet wheel, ratchet lever, 10#, 19#, 32# socket, 10# ring wrench, vice, torque wrench, slotted screwdriver.

Accessories: brake fluid

3. Notices

3.1 Please wear necessary labor protection supplies to avoid accidents.

3.2 The brake liquid is one toxic liquid. In event of contact with the skin or eyes due to carelessness, flush with a great amount of water and if necessary call for medical treatment timely.

3.3 The scrapped brake liquid should be accommodated in the container. It's prohibited to drain it into the sewage system or stack with other household garbage.

3.4 Do not depress the brake pedal nor move the vehicle during the removal/installation operation.

3.5 Do not make the friction lining or brake disc come contact with the oil substances, which will impair the braking effects.

4. Removal Procedure

4.1 Remove the rear wheels (see the removal procedure of front wheels).

4.2 Remove two position bolts from the brake drum with the cross screwdriver.



4.3 Remove the bearing dust cap with slotted screwdriver.



4.4 Vibrate the brake drum to remove it.



4.5 Observe the rear braking structure.



4.6 If it's necessary to check the brake drum bearing, remove the lock nuts shown in the figure with 30# socket and torque wrench and remove the brake drum bearing.

Torque: 250 ± 10 Nm



4.7 Remove the handbrake cable with calliper.



4.8 Remove the upper return tension spring with calliper.



4.9 Remove the lower return tension spring with calliper.



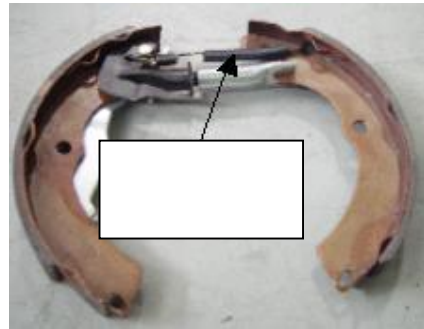
4.10 Depress the spring strip of the brake shoe positioning tie rod with calliper and then rotate clockwise or counter clockwise for 90° to remove two brake shoe position tie rods.



4.11 Pull out two brake shoes.



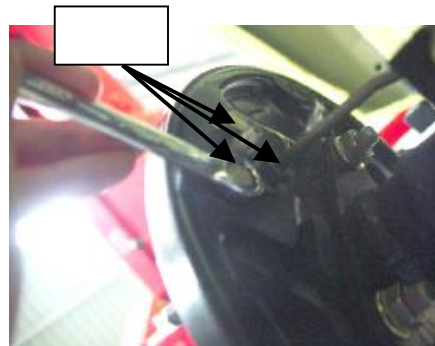
4.12 Remove the tension spring to separate the brake shoe.



4.13 In the event of detection of over-tight rear brake, it may adjust the length of the push rod: Rotate clockwise to eliminate the friction.



4.14 Remove the three bolts shown in the figure with 10# ring wrench.



4.15 Remove the branch pump and break it down for checking of intactness.

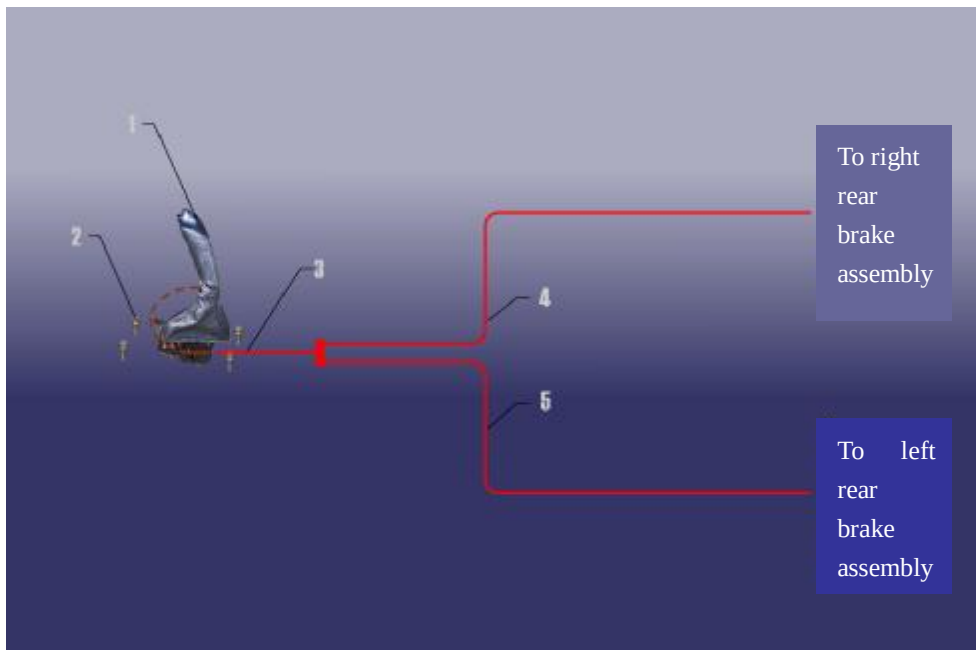


4. Installation Procedure

Refer to removal procedures.

IV. Adjustment and Replacement of Handbrake

1. System Composition Illustration



1. Handle 2. Fixing bolts 3. Cable 4, 5. Left/Right rear wheel cable

2. Preparations

Tools: Ratchet wheel, ratchet lever, 10#, 13#, 14#, 16# socket, 10# 13#, 14# ring wrench, vice, torque wrench, slotted screwdriver.

3. Notices

- 3.1 Please wear necessary labor protection supplies to avoid accidents.
- 3.2 During the removal/installation of the spring parts, enough cautions should be taken to prevent the ejection of such parts from causing body injuries.
- 3.3 The removal/installation at the vicinity of the exhaust pipe must be conducted only after the temperature of the exhaust pipe is lowered to normal temperature so as to prevent scald.

4. Removal/Installation Procedure

- 4.1 With reference to the removal/installation of the rear brake, loosen the handbrake cable of the rear wheels.



4.2 Remove the handbrake clip with pliers.

Notice: It's under the rear wheels.



4.3 Remove the fixing bracket bolts of the handbrake cable shown below with 8# ring wrench.

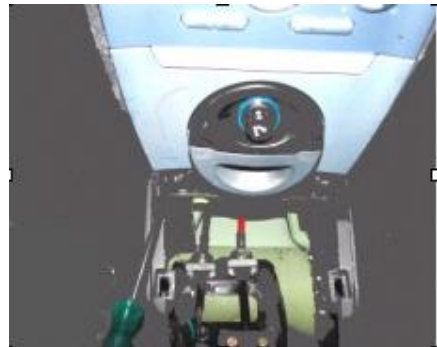
Torque: 9~12 Nm



4.5 Pry out the protective cover at the handbrake and gear position with slotted screwdriver.



4.6 Remove all fixing screws from the secondary instrument panel assembly with ring screwdriver to remove the secondary instrument panel assembly.



4.7 Remove the handbrake adjustment nuts with 10# wrench.



4.5 Loosen the two handbrake cables with hand.



4.9 Pull out the handbrake cable from the underside of the vehicle body.

Notice: Remove the handbrake cable at another side in accordance with the same method.



4.10 (**Handbrake adjustment**) The length of the handbrake cable equipped on this model is designed to be the fixed length. To adjust the handbrake effects, refer to the part “removal of rear brake”. The adjustment of the ejector rod length (clockwise for looseness and counter clockwise for tightness) can achieve the handbrake adjustment.



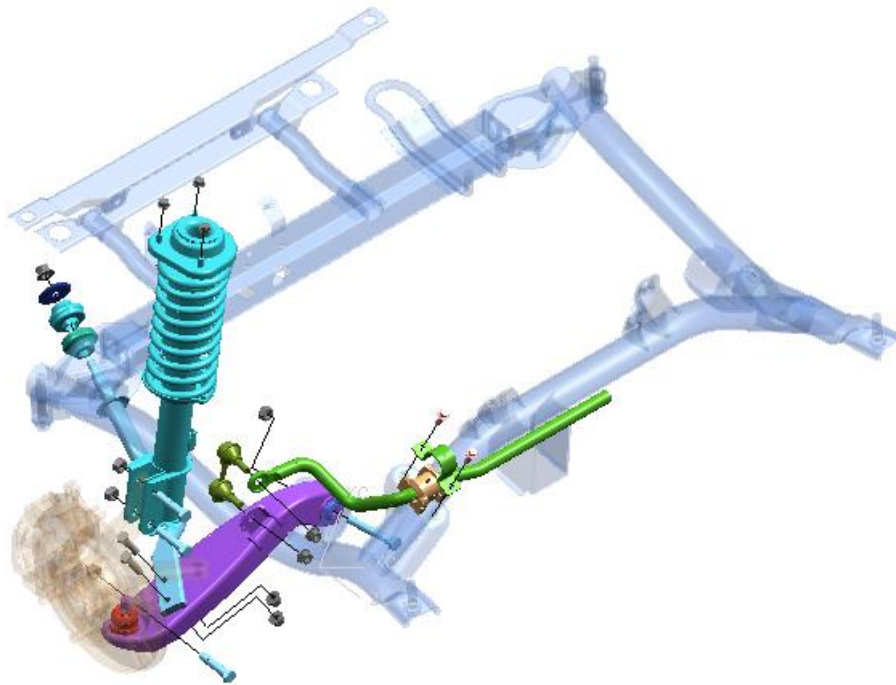
4.11 The installation procedure should be conducted with reference to the removal procedure.

Chapter 2 Adjustment of Suspension System and Four-Wheel Alignment

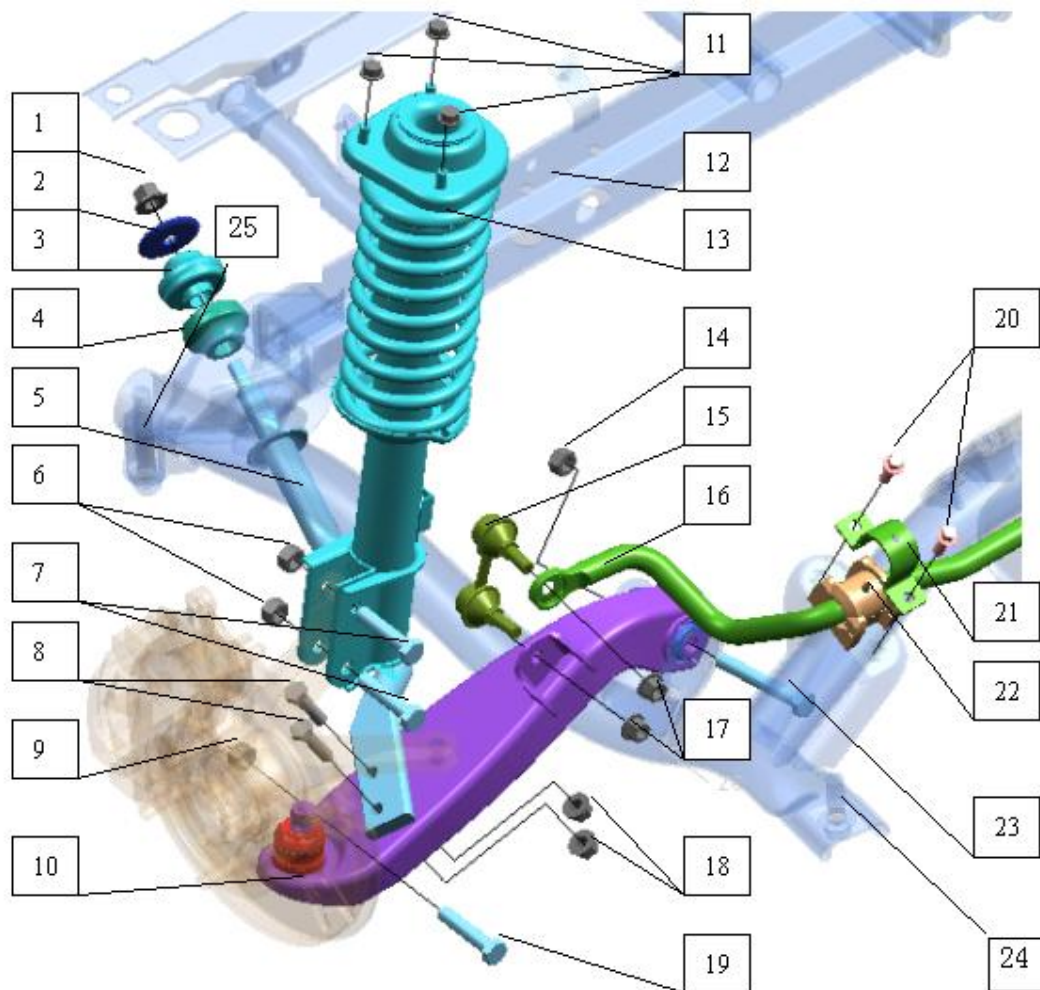
I. Removal/Installation and Overhaul of Front Axle and Suspension

1. System Structural Diagram

The front axle of Chery S21 model adopts the split steering drive axle, with MacPherson independent suspension. The upper end of the suspension is connected with the vehicle body as the lower end is connected with the secondary vehicle frame. The front Macpherson suspension undertakes the dual functions of driving and steering. Subframe connects with vehicle body via elastic element, which improves diving stability and ride comfort.



Structural diagram of Front Axle and Suspension System



1 Nut	9 Nut	17 Nut
2 Gasket	10 Left control arm	18 Nut
3 Rubber gasket I	10 Right control arm	19 Bolt
4 Rubber gasket II	11 Nut	20 Bolt
5 Left propelling rod weldment assembly	12 Secondary vehicle frame	21 Clamp
5 Right propelling rod weldment assembly	13 Front strut assy.	22 Rubber bush
6 Nut	14 Nut	23 Bolt
7 Bolt	15 Front connecting rod assy.	24 Bolt
8 Bolt	16 Front stabilizer bar	25 Bolt

Composition List for Front Axle and Suspension System

2. Preparations

Tools: 8#, 15#, 18#, 19# socket; 10#, 13#, 15# wrench.

3. Notices

2.1 Please wear necessary labor protection supplies to avoid accidents.

2.2 When carry out maintenance and repair to chassis, please note that whether the safety lock of lifting machine is locked.

2.3 When carry out removal/installation to shock absorber spring, prevent spring ejection from being injured.

2.4 It's prohibited to conduct the welding and correction on the bearing components of the wheel suspension and the guiding components of the wheels.

2.5 During the removal of the chassis component, renew the self-lock nuts and rusted nuts so as to guarantee the safety.

4. Removal/Installation Procedure

4.1 Removal of shock absorber assembly

4.1.1 Remove the tire fixing nuts with 19# socket or vehicle attached wrench to remove the tire (take left side for instance).

Torque: 110 ± 10 Nm



4.1.2 Remove the ABS pipeline from the fixing seat with hand.



4.1.3 Remove the fixing bolts of steering joint and shock absorber with 18# socket.

Torque: 110 ± 10 Nm



4.1.4 Remove the three fixing bolts of shock absorber assembly from the vehicle frame with 13# socket.

Torque: 60 ± 5 Nm



4.1.5 Remove the shock absorber assembly.

4.2 Removal of Control Arm Assembly

4.2.1 Remove the fixing bolts of front connecting rod assembly from the control arm with 15# socket.

Torque: 100 ± 10 Nm



4.2.2 Remove the connecting bolts of front propelling rod and control arm with 15# wrench.

Torque: 75 ± 5 Nm



4.2.3 Remove the ball joint fixing bolts from control arm and steering universal joint with 18# socket and 18# ring wrench.

Torque: 100 ± 10 Nm



4.2.4 Remove the connection bolts of control arm and front axle with 18# socket to remove the control arm assembly.

Torque: 150 ± 10 Nm



4.3 Removal of Front Axle Assembly

4.3.1 Remove the fixing bolts from the chassis mud guard to remove the mud guard assembly.

Torque: 3 ± 0.5 Nm



4.3.2 Remove the front bracket bolts of the transmission from the secondary vehicle frame with 19# socket.

Torque: 110 ± 10 Nm



4.3.3 Remove the rear bracket bolts of the transmission from the secondary vehicle frame with 19# socket.

Torque: 110 ± 10 Nm



4.3.4 Remove the two connecting bolts of front exhaust pipe with 15# socket.

Torque: 50 ± 5 Nm



4.3.54 Remove the two connecting bolts of front exhaust pipe and rear muffler with 15# socket.

Torque: 50 ± 5 Nm



4.3.6 Remove the fixing bolts at the right side of the booster steering gear with 13# wrench.

Torque: 75 ± 5 Nm



4.3.7 Remove the fixing bolts at the left side of the booster steering gear with 15# wrench.

Torque: 75 ± 5 Nm



4.3.8 Remove the fixing bolts of propelling rod and secondary vehicle frame with 19# socket.

Torque: 105 ± 10 Nm



4.3.9 Remove the fixing bracket of the A/C pipeline from the secondary vehicle frame with 10# wrench.

Torque: 25 ± 2.5 Nm



4.3.10 Remove the fixing bracket of the condenser from the secondary vehicle frame with 13# wrench.

Torque: 45 ± 5 Nm



4.3.11 Remove the four connecting nuts of secondary vehicle frame and vehicle body with 18# socket to remove the front axle assembly.

Torque: 150 ± 10 Nm



4.3.12 Remove the fixing bolts and nuts from the rubber sleeve of the stabilizer rod with 10# wrench.

Torque: 50 ± 5 Nm

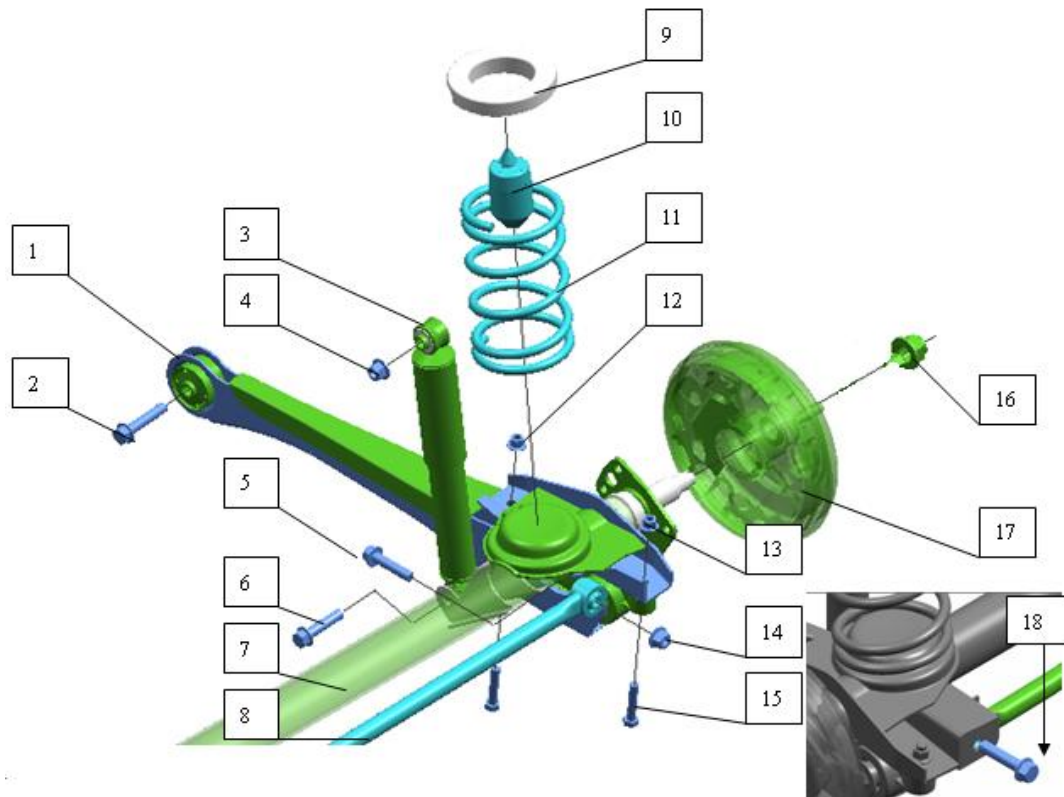


5. Installation Procedure

Refer to the removal procedures of front axle and front suspension.

II. Removal/Installation and Overhaul of Rear Axle and Suspension

1. System Structural Diagram



1	Rear trailing arm assembly	7	Rear shaft welding assembly	13	Nut
2	Bolt	8	Cross stay assembly	14	Nut
3	Rear shock absorber assembly	9	Rear spring cushion	15	Bolt
4	Nut	10	Rear bumper block	16	Lock nut
5	Bolt	11	Rear coil spring	17	Rear brake band drum assembly
6	Bolt	12	Nut	18	Bolt

Structural diagram of Rear Axle and Suspension System

2. Preparations

Tools: 11#, 13#, 15#, 16#, 19#, 30# socket, Slotted screwdriver, priers.

3. Notices

3.1 Please wear necessary labor protection supplies to avoid accidents.

3.2 Notice to lock the safety lock of the elevator during the repair of the chassis.

3.3 When carry out removal/installation to shock absorber spring, prevent spring ejection from being injured.

4. Removal/Installation Procedure

4.1 Removal of Shock Absorber Assembly and Shock Absorber Spring.

4.1.1 Remove the tire fixing nuts with 19# torque wrench or vehicle attached wrench to remove the tire (take left side for instance).

Torque: 110 ± 10 Nm



4.1.2 Remove the connecting bolts of shock absorber assembly and rear axle with 18# socket.

Torque: 100 ± 10 Nm



4.1.3 Remove the connecting bolts of shock absorber assembly and vehicle body with 18# socket to remove the shock absorber assembly.

Torque: 100 ± 10 Nm



4.1.4 Pry out the rear coil spring with screwdriver.



4.1.5 Vibrate from side to side with force with hand to remove the rear bumper block.



4.2 Cross Stay Assembly

4.2.1 Remove the connecting bolts of cross stay and left side of vehicle body with 16# socket.

Torque: 100 ± 10 Nm



4.2.2 Remove the connecting bolts of cross stay and right side of vehicle body with 15# socket to remove the cross stay assembly.

Torque: 100 ± 10 Nm



4.3 Rear Trailing Arm Assembly

4.3.1 Remove the connecting bolts from the rear side of rear axle and trailing arm assembly with 13# socket.

Torque: 100 ± 10 Nm



4.3.2 Remove the connecting bolts from the middle side of rear axle and trailing arm assembly with 13# socket.

Torque: 100 ± 10 Nm



4.3.3 Remove the connecting bolts of trailing arm and vehicle body with 15# wrench to remove the rear trailing arm assembly.

Torque: 100 ± 10 Nm



4.4. Removal of Rear Axle Assembly

4.4.1 Remove the connecting bolts of brake pipeline and rear axle with 11# socket. Notice the storage of brake liquid.

Torque: 16 ± 3 Nm



4.4.2 Remove the rear brake band drum assembly.



4.4.3 Remove the handbrake cable with priers.



4.4.4 Remove the lock nuts from the rear brake band drum assembly with 30# socket to remove the rear brake band drum assembly.

Torque: 180 ± 10 Nm



4.4.5 Remove the rear axle assembly.

5. Installation Procedure

The installation procedure is reverse to that of removal.

III. Adjustment of Four-Wheel Alignment

Please conduct the measurement and adjustment of parameters on the four-wheel alignment instrument recommended by Chery Auto.

1. Adjustment of Front Wheel Toe-In

The toe-in can be adjusted by means of the optical testing instrument or mechanical toe-in adjustment instrument.

1.1 Depending on the requirements of the testing instrument, conduct the pre-adjustment preparations for the wheel alignment;

1.2 Loosen the lock nuts of right steering track rod and the spring clips of protective sleeve. Based on the demands, rotate the toe-in adjustment rod to adjust the length, till reach the specified value.

Toe-in value: $6' \pm 6'$

1.3 Tighten the lock nuts and install the spring clips of the protective sleeve. Check if the lock nuts are properly tightened and the protective sleeve is in right position;

Torque: 35 ± 3 Nm

1.4 At the finish of toe-in adjustment of front wheels, check the steering wheel for levelness. Otherwise, loosen the lock nuts of the steering wheel, adjust the steering wheel to level position, and then tighten the lock nuts of the steering wheel to the specified torque.

2. Adjustment of Front Wheel Camber Angle

2.1 Under normal conditions, it's unnecessary to adjust the camber angle after the assembling of independent suspension and wheel steering joint. In case the wheel camber angle is out of the tolerance scope due to other reasons, it may be calibrated by means of the connecting bolts of independent suspension and steering joint.

Front wheel camber angle: $0.87^\circ \pm 50'$

2.2 Before the calibration, check (visual observation) the driving system components for damage and replace the damaged parts.

2.3 In case the front wheel camber angle is out of tolerance, loosen the connecting bolts of front shock absorber and steering joint and move the wheels for correction.

3. Adjustment of Caster Angle and Kingpin Inclination

The caster angle and the kingpin inclination are guaranteed by the designed structure and are free of adjustment during use.



Caster angle: $3.4^{\circ}\pm 30'$

Kingpin inclination: 12.7° If the parameters are out of the specified range, replace the steering joint.

4. Adjustment of Rear-Wheel Alignment Parameters

All of the rear wheel positional parameters shall be guaranteed through design process.

4.1 Rear wheel camber angle: $0^{\circ}\pm 30'$

4.2 Rear wheel toe-in: $0^{\circ}\pm 10'$

4.3 If the deformation of rear shaft arising from the great impact force causes the change of rear wheel alignment parameters that out of the specified range, correct the rear axle or replace the rear axle.

IV. Tire Installation and Air Pressure Adjustment

1. Installation of Air Valve

Prior to installing tire valve, firstly check the valve port to ensure whether it is smooth and free from burr, and then apply glycerol on the rubber body surface, or soak the tire valve into glycerol. Pull or press (200 - 400N) using special tools to make the locating ring of the valve can go through the wheel holes, to this point, the assembly is completed (soap water is allowed to substitute glycerol).

2. Tire Assembling

Before fit the tire, apply glycerol or soap water along the cycle of tire bead, meanwhile, note that:

2.1 When there is colored dot on the wheel rim, align the uniformity testing mark of tire to the colored dot mark of wheel rim.

2.2 When without colored dot on the wheel rim, align the dynamic balance testing mark of tire to valve position.

2.3 When without colored dot on the wheel rim, additionally, there is no dynamic balance testing mark, however, static balance testing mark is available, at this point, align the tire valve to the static balance testing mark.

2.4 The description concerning the uniformity, dynamic balance and static balance testing marks for tires will be additionally provided in writing by the product division of Chery Company or suppliers. In addition, this kind of descriptions will clearly be indicated on process sheet.

2.5 Carry out tire inflation strictly in accordance with specified pressure. During inflating process, air pressure shall not exceed 10% of rated pressure. When performing separate packaging to spare wheel assembly, the rated inflation pressure shall be 3.0bar, and the spare wheel assembly shall be stored separately from four wheels. Before the four-wheel alignment, check the air pressure of all wheels and adjust the air pressure: 2.3bar for front wheels and 2.1bar for rear wheels.

3. Tire Inflation

After completion of tire inflation, screw up the protective cap of valve, and then carry out dynamic balancing test. Fit appropriate balance weight at the internal and external fringe of wheel rim as required. It is required that the unbalancedness of the final assembly shall be less than $100\text{g} \cdot \text{cm}$, which is approximately equivalent to a 5g balance weight at the internal and external fringe of wheel rim. Note: each wheel and each side can use only one balance weight. Additionally, its maximum mass shall not be more than 70g. During assembling process, never hit the balance weight too heavy. Otherwise, replace balance weight in time. In addition, never use the replaced balance weight again.

4. Installation of Wheel and Tire Assembly.

When fixing wheel and tire assembly, first, manually screw up the wheel bolt onto the hub for pretension, after that use special tools for tightening in accordance with diagonal process. Tightening torque shall be $110 \pm 10\text{N.m}$. It is prohibited to use impact wrench to prevent from wheel damage, over loose or over tight. It is not allowed to apply grease on wheel bolt (For new installed wheel and tire assembly, the wheel bolts should be tightened at first running of 100km to guarantee the tightening torque. The tightening torque checking of wheel bolts is one of the items of regular maintenance)

5. Tightening Method of Wheel Nuts

Tighten the fixing nut in a decussate way, the tightening force shall be approximately equal, then wheel shall be able to turn freely. When carry out final tightening, the wheel shall be on the ground.

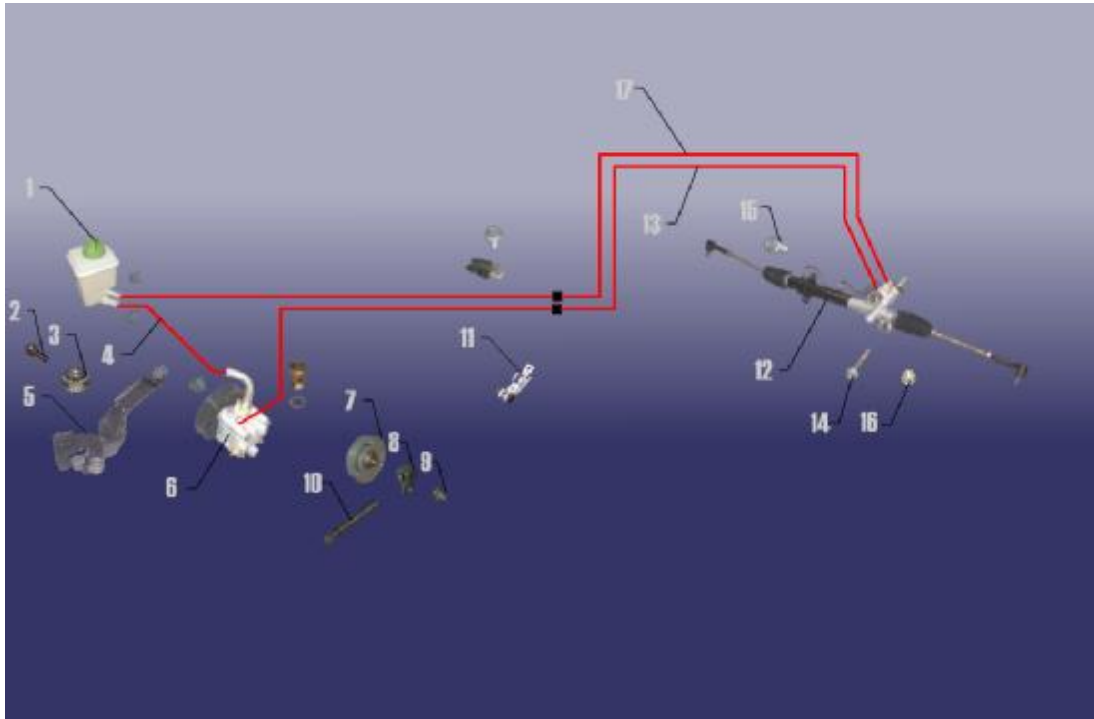
6. Installation of Decorative Cover

Mount trim cover or place trim cover as required. When fitting clip-type trim cover, place knock in position by hand or via rubber tools.

Chapter 3 Removal/Installation and Overhaul of Steering System

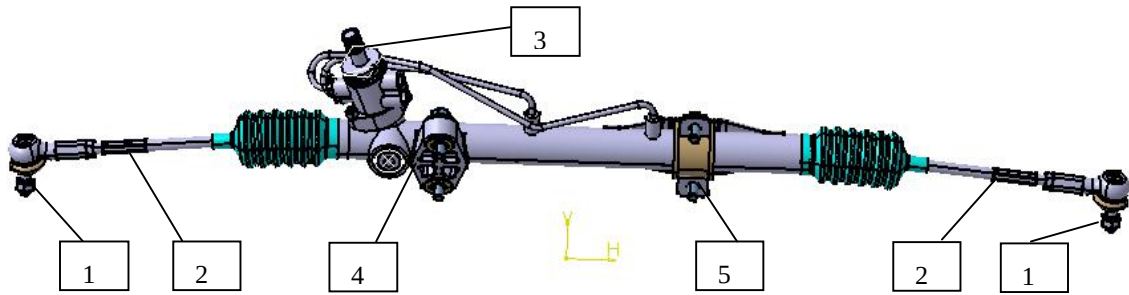
I. Removal/Installation of Steering Gear

1. System Composition Illustration



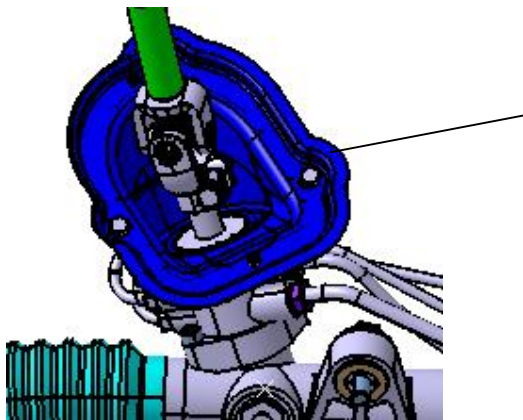
- | | |
|--------------------------------------|------------------------|
| 1. Booster steering liquid reservoir | 2. Bracket fixing bolt |
| 3. Bracket fixing nut | 4. Outlet pipeline |
| 5. Reservoir fixing bracket | 6. Steering pump |
| 7. Tensioner | 8. Lock nut |
| 9. Adjustment nut | 10. Adjustment tie rod |
| 11. Pipe clamp | 12. Steering gear |
| 13. Outlet pipeline | 14. 15. Fixing bolt |
| 16. Fixing nut | 17. Return pipeline |

The breakdown illustration of steering gear is shown below:



1 – Lock nuts 2 – Track rod 3 – Input shaft 4 – Left installation bracket 5 – Right installation bracket

The illustration of steering universal joint and protective sleeve is shown below:



S21-3404060
(Steering universal knuckle
protective sleeve assembly)

2. Preparations

Tools: 13#, 19# socket wrench, 12#, 13#, 17# non-adjustable wrench.

Accessories: power steering fluid

3. Notices

3.1. Please wear necessary labor insurance products in order to avoid the accidents.

3.2 Avoid steering fluid to contact with skin or eyes when disassembling steering system.

4. Removal/Installation Procedure

4.1 Remove the fixing nuts at the both sides of steering ball joint with 19# socket.

Torque: 40 ± 5 Nm



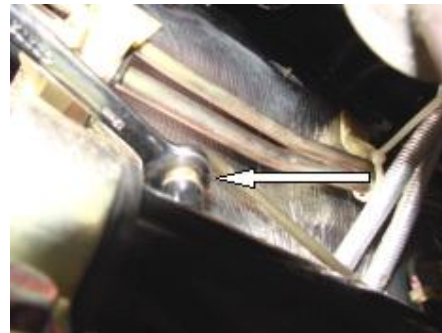
4.2 Loosen the fixing nuts under the booster steering hose with 17# non-adjustable wrench.

Torque: 25 ± 5 Nm



4.3 Loosen the fixing nuts above the booster steering hose with 12# non-adjustable wrench.

Torque: 25 ± 5 Nm



4.4 Remove the fixing screws above the right bracket of power steering gear with 13# socket.

Torque: 100 ± 10 Nm



4.5 Remove the fixing screws under the right bracket of power steering gear with 13# socket.

Torque: 100 ± 10 Nm



4.6 Remove the fixing screws above the left bracket of power steering gear with 13# socket.

Torque: 100 ± 10 Nm



4.7 Remove the fixing screws under the left bracket of power steering gear with 13# socket.

Torque: 100 ± 10 Nm



4.8 Remove the fixing bolts of the steering universal joint with 10# socket wrench to remove the steering gear assembly.

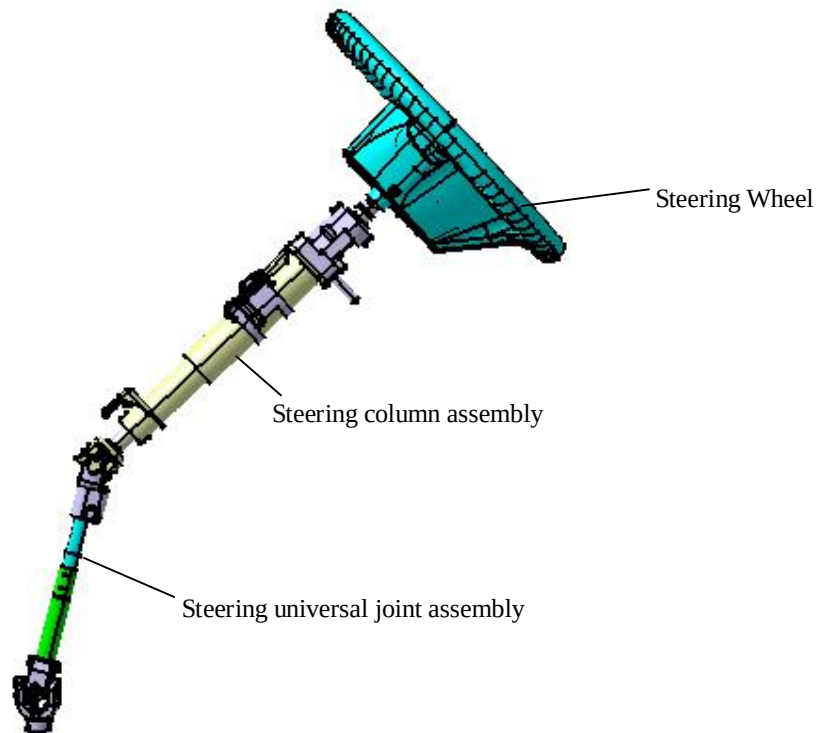


5. Installation Procedure

Refer to removal procedures.

II. Removal/Installation of Steering Column

1. System Composition Illustration



1 – Steering wheel

2 – Steering column assembly

3 – Steering universal joint assembly

2. Preparations

Tools: Cross screwdriver, 5#, 6# inner hex wrench, 10#, 13#, 22# socket wrench.

3. Notices

- 3.1 Please wear necessary labor protection supplies to avoid accidents.
- 3.2 Avoid steering fluid to contact with skin or eyes when disassembling steering system.
- 3.3 Before disassembling steering wheel, disconnect negative of battery cell to avoid airbag ejection.

4. Removal Procedure

4.1 Loosen the two screws under the steering wheel with 5# inner hex wrench.



4.2 Remove the horn cover from the steering wheel.



4.3 Remove the fixing nuts of the steering wheel with 22# socket wrench.



4.4 Remove the steering wheel after screw off the nuts.



4.5 Screw off the two screws from the front surface of combined switch guard plate with cross screwdriver.



4.6 After screw off the screws, open upward to remove the upper protective cover.



4.7 Screw off the three screws from the lower side of combined switch guard plate with cross screwdriver.



4.8 Remove the lower protective cover after screw off the screws.



4.9 Remove the two fixing screws from the combined switch with cross screwdriver.



4.10 Pull out all plugs from the combined switch. (Total 5 plugs)



4.11 Remove the combined switch.



4.12 Pull out the plug of ignition switch.



4.13 Screw off the fixing screws from ignition lock with 5# inner hex wrench and remove the ignition lock assembly.



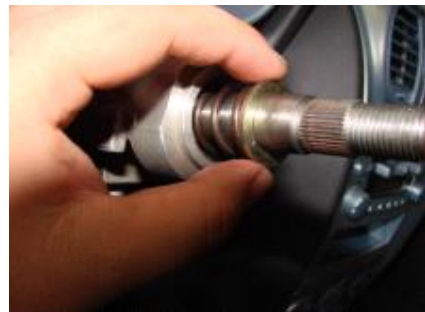
4.14 Screw off the 4 fixing screws from the upper end cap with 6# inner hex wrench.



4.15 Remove the outer caliper with the outer caliper pliers.



4.16 Remove the retainer and spring with hand.



4.17 Remove the upper end cap with hand.



4.18 Remove the two upper fixing nuts from the steering column with 13# socket.

Torque: 25 ± 3 Nm



4.19 Remove the two lower fixing nuts from the steering column with 13# socket.

Torque: 25 ± 3 Nm



4.20 Remove the connecting nuts of steering column and steering universal joint with 10# socket to remove the steering column assembly.

Torque: 25 ± 3 Nm



4.21 Remove the connecting bolts of steering universal joint and steering gear with hand.

Take out steering universal joint assembly.

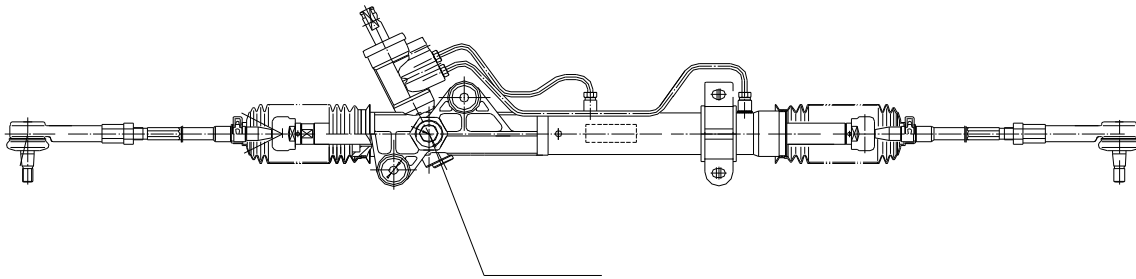


5. Installation Procedure

Refer to removal procedures.

III. Adjustment of Steering Gear Clearance

1. Place the wheels at linear driving position;
2. Rotate the steering wheel towards both sides;
3. If heard noise of steering gear, adjust the screw as shown in the diagram until no impinge noise is heard when turning steering wheel;
4. Tighten the screws for further 1/8 turn (approximate 45°);
5. Carry out the road test;
6. If the steering mechanism can not return to the central position by itself, then loosen the bolt for 15° ;
7. Carry out the road test.



IV. Adjustment of Power Steering System

1. Correctly connect power steering oil pipe—where the tightening torque for the connector between oil return pipe, high-pressure oil pipe and steering gear shall be $35 \pm 3\text{N.m}$, the tightening torque of hollow bolt connecting high-pressure oil pipe and power steering pump shall be $45 \pm 3\text{N.m}$. When filling power steering oil, it is recommended to use special purpose vacuum pumping oil. The specifications for filling power steering hydraulic fluid and exhaustion are described as below:

Fill power steering hydraulic fluid into steering reservoir assembly to the maximum level, start engine at low speed (idle speed) to drive the steering pump, the steering system will be quickly full of hydraulic fluid. In the oil filling process, only let engine run at idle speed to drive vane pump. Meanwhile, continuously add hydraulic fluid to prevent vane from sucking air due to oil level drops.

2. When hydraulic fluid in the oil tank presents emulsification state, or the pump emits excessive noise (under normal condition, max. noise shall be 80 db), it must carry out exhaustion process. The exhaustion procedure is described as below:

Jack the front part of the vehicle till two front wheels are hung up, start the engine, turn the steering wheel to right and left till reach limit position (caution: after come to the limit position, try not to stop, even if stop, never maintain over 2 seconds). Repeat above action for several times, until the air in the system is gradually exhausted from the oil reservoir. In this process, with the drop of oil level, continuously supplement hydraulic fluid until the oil comes to specified level.

3. Regularly check and adjust the tension of power steering belt: vertically apply a 100N force at the middle of the belt, the max. deflection of belt shall be less than 5 mm, otherwise adjust the belt tension until meet the above requirement via adjusting tension bolt.

4. When in service, it is prohibited to turn the steering wheel to limit position, even if it has to do so, never maintain at this position over 10 seconds. It is strictly prohibited to use power steering pump without oil. If the driver suddenly feels the steering heavy in service, immediately stop the vehicle, dismantle and repair accordingly.