

AXLE AND SUSPENSION SYSTEM

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AXLE AND SUSPENSION SYSTEM

ALIGNMENT OF THE WHEEL

It is easy to understand that the theory of the four wheels alignment related to the definitions and the functions of various angles. However, the corresponding theory can hardly be applied to the four wheels alignment tester and chassis maintenance due to the chassis structure of the vehicle body, which all the angles of the four wheels alignment bear on the mechanical structure of the chassis. For examples:

- — The camber will be changed as the toe-in varied. The wheels will be turned while adjusting the toe-in, which results the camber changing. The larger the caster is, the more the camber changed.
- — The wheel setback will be changed as the caster adjusted. When the caster increases or decreases, the upper fulcrum of the steering shaft can move forwards or backwards and the lowest fulcrum of the steering shaft (tire) is also movable. The front wheel moves forwards or backwards along with the caster increasing or decreasing so that the axle setback will be altered. The turn plate must have the function of sliding forwards and backwards in order to make the front wheel move forwards and backwards freely.
- — The toe-in will be changed as the camber varied and vice versa. Various suspension structures have different ways to adjust the camber. If the upper or lower fulcrum is moved left or right, not only the camber but also the toe-in will be changed. As a result, even if the camber is properly adjusted, the stable driving status cannot be achieved because of the toe-in changing. Therefore, after eliminating of malfunction, another one will appear.
- — Changing the toe-in of the rear wheel influences that of each front wheels. The toe-in of the rear wheel determines the thrust angle of the rear wheel. The method of thrust line positioning is adopted to determine the toe-in of the front wheel in all the advanced four wheels alignment testers.

Precaution: The front wheel must be adjusted first and then the rear wheel when processing the four wheels alignment. The sequence of the rear wheel adjustment is the camber first, the toe-in second and so on. And the sequence of the front wheel adjustment is the caster first, the camber second, the toe-in third and so on.

BASIC INSPECTION BEFORE THE ALIGNMENT

Check the tire pressure, tire No. and rim No.

----Check the tire pressure and adjust it to the specified pressure

Tire inflation pressure

kPa

Item	Front wheel	Rear wheel	Spare wheel	Mini spare wheel
No-load/half-load	200	220	350	420
Full-load	210	260	420	420

-----Rim and Tire

A15LHD wheel No.

Tire No.	Rim No.
185/60 R14×82H	6J×14

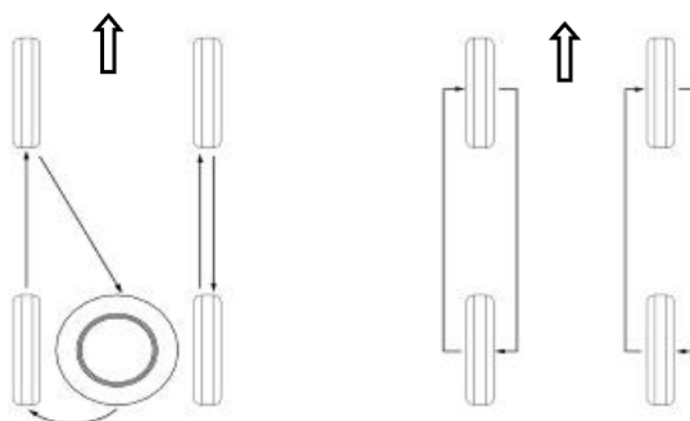
Note:

The above tire-rim combination is suitable for the steel or aluminum alloy rim. Please do not use rims and tires of other models which may lead to improper consequence.

Preaution: Be sure to consult the relevant instruction if non-standard tires or rims (such as light weight alloy rims or wheels of winter tire)should be installed.

Positioning of the tire

Different working conditions between the front wheel and the rear wheel lead to the different wear status, which depends mainly on the road condition, the driving custom and so on. The front wheel wears faster than the rear one does. In order to prevent the tires from wearing in different degrees and to prolong the service life of the tires, it is necessary to check and rotate the tires, adjust the tire pressure, and examine the tightening degree of the wheel bolt at interval of 5000km.



----- Utilization of the cold-resistant tire

If using the cold-resistant tire, all the four tires must be replaced at same time. Please do not excess the top speed and must accord to the tire pressure limited by the tire manufacturer.

Precaution: Using the cold-resistant tire may affect the safety and the maneuverability of the vehicle. Standard tires in same size and No. should be utilized. Do not use the cold-resistant tire as long as the road condition is available.

-----Snow chain

Adjusting the snow chain of the tire should accord to the type of the road condition. Inspection must be applied before install the snow chain. Please refer to the instruction of the snow chain manufacturer when install the snow chain on the tire. Please remove the wheel house before install the snow chain which may score the wheel house. Install the snow chain firmly on the front tire. It is not recommended to fix the snow chain on the rear wheel. The snow chain should be retightened after 0.5~1.0km driving with it.

Precaution: Using the snow chain may affect the vehicle maneuverability, so the vehicle speed should not exceed 50km/h (30mph) or the speed limited by the snow chain manufacturer(less than 50km/h). Please stop the car and tighten the snow chain immediately when hearing collision between the snow chain and the vehicle body or the chassis when using the snow chain. Abrupt turning, concussion and passing the chuckhole, the vehicle locking and braking should be avoided. The instruction of the snow chain manufacturer should be also complied. Improper utilization of the snow chain will cause interference between the snow chain and the vehicle body.

Installation of the tire

---Make sure that the opening of the valve is slippery and no burrs before installing the tire valve. Then apply glycerol onto the rubber surface of the tire valve or dip it briefly in the glycerol. Pull or press the locating ring of the tire valve with special purpose tool at the force of 200-400N in order to make it through the hole on the wheel, which means the installation is finished. (Suds are permitted to replace the glycerol.)

---Wipe glycerol or suds round the bead before installing the tire, and please note at the same time:

When there is a light point mark on the rim, please aim the uniformity test mark at the point.

When there is no light point mark on the rim, please aim the dynamic balance test mark at the position of the tire valve.

When there is no light point mark on the rim and no dynamic balance test mark but the static balance test mark on the tire, please aim the tire valve at the static balance test mark.

The instructions for the uniformity, dynamic balance and static balance test mark of the tire should be offered by the production department or the supplier in written form.

---Inflate the tires according to the specified pressure strictly. Please do not exceed 10% of the rated pressure during inflating. The spare tire assy is assembled at the rated pressure of 3.5atm and is separately stored with the four tires installed on the vehicle. Please check and adjust the tire pressure before the four wheel alignment: front wheel 2.0 ± 0.2 atm, rear wheel 2.1 ± 0.2 atm.

---Screw the valve cap after inflating the tire and undergo the dynamic balance test. Set the proper weight balance block onto the inside and outside brims of the rim as required. The

final assy imbalance is expected to be less than 100g • cm, approximately equal to a 5g balance block on the inside and outside brims of the rim.

Precaution: No more than one balance block with 70g weight at most is allowed to set on each side of a wheel. Avoid over hitting on the balance block. If that happened, replace it immediately. Do not reuse the replaced balance block.

- During installing the wheel and the tire assy, pre-screw the wheel bolt on the rim by hand first, and then tighten the screws with the special purpose tools under the way of diagonal method, (the tightening torque is $100 \pm 10\text{N} \cdot \text{m}$). No impact wrench is allowed in order to avoid screwing too tight or loose. Do not use lubricating grease while installing the wheel bolt. (The wheel bolt should be tightened to maintain the tightening torque after the initial 100km driving since the new installation of the wheel and tire assy. The check of the tightening torque of the wheel bolt is one of the daily service items.)
- Decussating method is adopted to tighten the set nut. The tightening degrees should be similar so that the wheels can turn freely. The wheel should stand on the ground during the last tightening.
- Install the trim cover or place it as required. Clip trim cover should be installed into through beating by hand or prying by rubber tools.

USUAL TROUBLES OF THE TIRE

Proper utilization of the tire

The tire is an important part of the wheel assy. Please pay attention to the following items while using:

- The tire of the same manufacturer and the same No. should be used on the same vehicle.
- Do not install tires out of the specified types
- Make all the tires wear evenly. In order to remedy and lighten the uneven wear, besides periodic checking and correcting the parameters of the wheel alignment, the rotation should be also applied. The specific rotation way depends on the practical wearing status. It is recommended to adopt the tire rotation at interval of 5000~8000km

Usual troubles of tires and trouble diagnosis

-----Wear on shoulder of tire

The wear on shoulder of tire means the brim with burrs forming of the tire wears are more badly than other parts. The theoretical reason for the wear on shoulder of tire is that the tire rolls at the limit lateral runout angle.

Main reason: Frequently steering at high speed, improper adjusting the toe-in and the camber, or often driving on the vaulted or zigzag road.

Maintenance: Adjusting the positioning angle of the front wheel

-----**Wear on center of tire**

The wear on center of tire means the abnormal wear on the center surface of the tire. The theoretical reason for this kind of wear is that the diameter elongation at the center of the tire surface is larger than that on the shoulder of the tire.

Main reason: Overhigh tire pressure

Maintenance: Readjusting the tire pressure to make it within the range of the specified value.

-----**Serrated wear**

The serrated wear means the wear on the surface of the tire strip in ladder shape. The theoretical reason for this kind of wear is the uneven deformation of the tread pattern of the tire contact patch.

Main reason: The toe-in and the camber are not conformed to the specified value

Maintenance: Adjusting the toe-in and the camber to make it within the specified value.
Checking the tire pressure is within the specified range.

-----**Initial severe wear somewhere on the tire**

The initial severe wear is the severe wear on the tread pattern of tire contact patch due to the wheel locking while emergent braking.

Main reason: Vehicle speed while emergent braking, road conditions, wheel load and the braking intensity

Maintenance: Avoiding emergent braking and taking precautionary measure as early as possible

-----**Nick and crack on the sidewall of tire**

The main reason is the sharp things on the road or the little stones, nails and metal flakes embedded into the tread slot.

-----**Initial wear on half round of the tire or wear in different places of the shoulders on both sides**

The main reason is the gyration part is in unbalanced state, or the tire and wheel are eccentric, or the bearing is worn or loose and so on. The eccentricity or bend of the rim or the steering knuckle may also cause the wear.

Troubleshooting Guide

Trouble	Possible causes	Solutions
Serious wear of tire	Improper tire pressure	Adjust
Tire noise	Improper tire pressure	Adjust

	Degradation of tire	Replace
Road noise or vehicle vibration	Insufficient tire pressure Unbalance of tire Deformation of rim or tire Uneven wear of tire	Adjust Adjust Repair or Replace --
Up-and-down shaking of steering wheel	Overbeating of tire and rim Looseness of wheel nut Unbalance of tire Breach or wear of engine bearing pad Breach or wear of transmission bracket rubber	Replace Lock Adjust Replace Replace
Circular vibration of steering wheel	Overbeating of tire and rim Looseness of wheel bolt Unbalance of tire Uneven wear of tire Insufficient tire pressure Damage or wear of front wheel bearing Malfunction of steering system Malfunction of suspension system	Replace Lock Adjust -- Adjust Replace -- --
One side deflection of steering wheel	Improper tire pressure Serious or uneven wear of tire Malfunction of steering system Malfunction of braking system Malfunction of suspension system	Adjust -- -- -- --
Unstable running	Uneven tire pressure of both sides Deformation of rim or tire Looseness of wheel bolt Malfunction of steering system	Adjust Repair or Replace Lock

	Malfunction of suspension system	-- --
One side deflection of braking	Uneven tire pressure of both sides Malfunction of braking system	Adjust --
Heavily steering of steering wheel	Insufficient tire pressure Malfunction of steering system Malfunction of suspension system	Adjust -- --
Improper returnability of steering wheel	Insufficient tire pressure Malfunction of steering system Malfunction of suspension system	Adjust -- --

Check whether the connection of the transmission rod of steering system is loose, deformed, etc.

Check the status of the ball joint and the rubber bush of front and rear suspension

Check whether the shock absorber works normally

-----Check whether the shock absorber leaks grease

-----Check whether the bush wears out

-----Check whether the shock absorber is improper through shaking the vehicle body up and down by pressing the foreside and the tail of the vehicle

Pre-check before wheel alignment

-----Check the status of the tire inflation. Adjust to the recommended pressure if necessary.

-----Check the clearance of the front wheel bearing. Adjust it if necessary.

-----Check the flop of the vehicle and the tire.

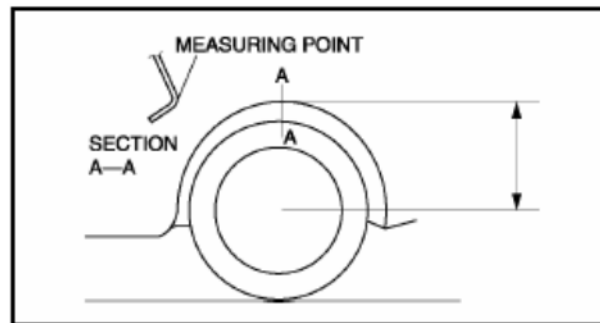
-----Check whether the ball joint and the steering linkage are too loose.

-----Check the shock absorber by shaking the vehicle.

Note:

- The vehicle must be on the level ground with no-load.
- No-load: Full gasoline in the oil reservoir, engine coolant and the oil filled at the specified level; the spare tire, jack and tools in the pointed position.

-----Measure the height from the wheel center to the mudguard edge. The measured difference from left and right should be not more than 10mm.



ALIGNMENT OF THE REAR WHEEL

It is recommended to utilize the four-wheel alignment tester with thrust line positioning method on this type of chassis.

Note: thrust line positioning is defined as adjusting the front wheel toe-in based on the rear wheel thrust line.

With the thrust line positioning, the adjustment of the rear wheel toe-in will influence the single front wheel toe-in, so during four-wheel alignment, the rear wheel should be adjusted before the front wheel alignment.

Measure the vehicle height

-----Rear measure point

From ground to the center of the joint bolt of the rear axle and the body (as the arrow shows)

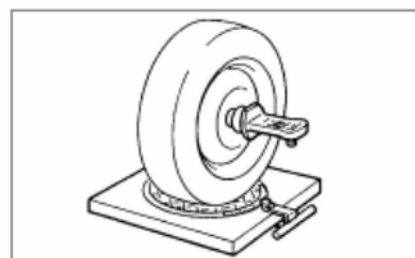


Precaution: Check whether the height from left and right are same before processing the wheel alignment

-----If there is a difference of the heights from left and right, that means there are damaged or deformed components of the front and rear suspension.

Install the wheel alignment tester on wheel

-----Please refer to the specific instruction of manufacturer for the wheel alignment tester.



Check the caster

Inspection angle	Value
Rear wheel caster	$-1^{\circ}30' \pm 10'$

Note: The rear wheel caster cannot be adjusted. If there is abnormal wear on the tire of the rear wheel, so check whether there are worn or deformed parts on the rear suspension

Check the rear wheel toe-in

Car No.	Chery A15LHD
Rear wheel toe-in	$20' \pm 10'$

Note: The rear wheel toe-in out of standard range may lead to wear on shoulder of tire on both sides. If the differences of the rear wheel toe-in both rear wheel are too much, the vehicle running direction may be affected. Therefore the rear wheel toe-in is a vital parameter of the alignment angles.

ALIGNMENT OF THE FRONT WHEEL

-----Install the wheel alignment tester on the wheel

Please refer to the specific instruction of manufacturer.

-----Check and adjust the wheel camber and the kingpin caster of the front wheel according to the standard

Angle	Value
Front wheel camber	$-30' \pm 20'$
Kingpin caster	$1^{\circ}30' \pm 30'$

Note: Adjust the caster before the camber

Kingpin caster

There is no need to adjust the kingpin caster for it is assured by the structure of design

Influence of caster

The main function of the caster is to keep the vehicle running straight forward. If the caster is positive, the inside of the vehicle descends and the chassis ascends which increase the steering knuckle load when the front wheel turns. If the casters of two wheels are same, the vehicle will return forward after turning. Increasing the positive caster angle will enhance stability of the steering wheel while the steering force will be increased at the same time. Decreasing the positive caster may reduce stability of the steering wheel but lightens the steering force.

The angle of the caster could not make the wear on tire. It is used to stabilize the steering direction and to return automatically after steering. If the vehicle is equipped with a traditional manual steering wheel, the caster is small or even tends to negative, which makes the steering easy. If the vehicle is equipped with a power steering wheel, the caster is usually set to be large positive in order to offer the driver a better feeling. Increasing the positive caster will increase the steering force but enhances the stability of straight running.

Adjust the camber

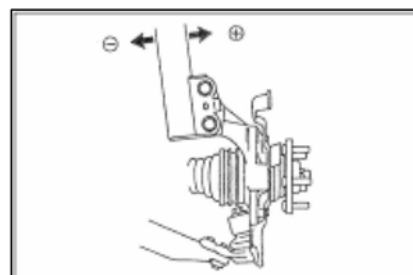
Under normal condition, there is no need to adjust the camber after assembling the independent suspension and the wheel steering knuckle. Use the joint bolt of the independent suspension and the steering knuckle to calibrate the wheel camber if the camber is out of the tolerance range for other reasons.



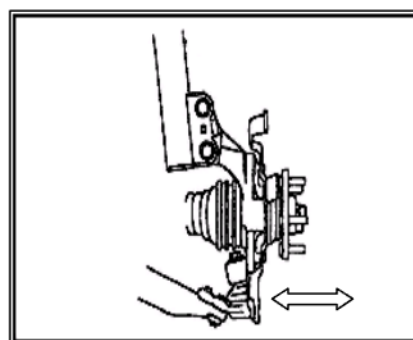
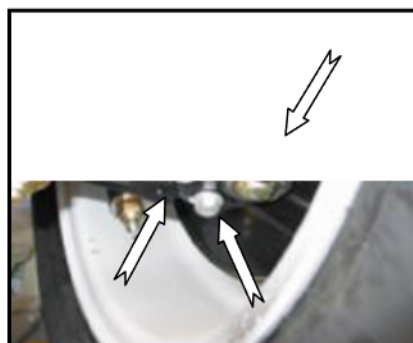
----Check (visual inspection) whether there are damaged parts in the steering system and replace the damaged ones before the calibration.

----If the front wheel camber is out of the tolerance, loosen the joint bolt of the front shock absorber and the steering knuckle and move the wheel to calibrate.

----For the further calibration, use the substitute bolt to adjust the wheel camber. Replace the M12 bolt with the M11 bolt. The camber is allowed to be adjusted within about $\pm 1^\circ$ shown as the illustration



- The connection between the lower control arm of the suspension and the steering knuckle is clearance fit. Loosen the joint bolt, move the wheel and adjust the camber.



Check the front wheel toe-in

Toe-in (general)

Car No.	Chery A15LHD
Front wheel toe-in	0'±10'

Tightening torque of toe-in: $55\pm 5\text{N}\cdot\text{m}$.

Adjust the toe-in

Optical tester or mechanical toe-in adjuster can be used to adjust the toe-in.

- According to the tester's requirement, make the wheel alignment well before the adjustment;
- Loosen the lock nut and the elastic cover snap ring of the right steering tie rod, and then screw the toe-in adjusting rod till the length of the rod reaches the specified value.
- Tighten the lock nut and reinstall the elastic cover snap ring. Check whether the lock nut is tightened enough and cover is in the correct position.
- After adjusting the front wheel toe-in, check whether the steering wheel is level. If not, loosen the lock nut of steering wheel, and then adjust to the level position. The tightening torque of the steering wheel lock nut is $55\pm 5\text{N}\cdot\text{m}$ as required.

FRONT SUSPENSION

The functions of axle and suspension system include receiving the torque generated by engine and passed via transmission system; producing the traction force between the road surface and the vehicle body through the adhesive force between the driving wheel and the ground in order to keep the whole vehicle steering normally; passing and bearing the counterforce on the wheel from different directions and relieving the impact and shake from the road to the vehicle body in order to ensure the stability and maneuverability of the whole vehicle. The front suspension is composed of the sub-frame, lateral stabilizer bar, control arm and etc.

REMOVAL AND INSTALLATION OF THE FRONT SUSPENSION

- Loosen the opening of the joint bracket of the front shock absorber assy and clip it to the bolt of the steering knuckle arm(tightening the lock nut to $80\text{N}\cdot\text{m}$), (shown as the picture)



- Remove the joint bolt of the control arm assy and the front steering knuckle with braker, and then release the front control arm assy.

Inspection of the control arm: check the situations of the damage crack and bend.



- Loosen the four bolts amountd on the sub-frame of the steering gear with tie rod assy (the specified tightening torque is $30\text{N}\cdot\text{m}$). (shown as the picture)



----Suspend the engine and transmission assy, loosen the bolts at the two supporting points from the engine and transmission to the sub-frame.



Caution: The removal process is extremely dangerous which could cause serious damage or even death. Please make sure the power assy is well fixed.



----Loosen the lock nut of the left-right steering tie rod and the steering knuckle arm, knock from one side to pry the ball joint out of the steering knuckle arm (The tightening torque is specified as 35 ± 3 N·m).



----Stand the front sub-frame by jack and loosen the four long-short bolts of the left-right sub-frame with the cross beam. (The tightening torque is specified as 130 ± 10 N·m).



Caution: The removal of the cross beam is extremely dangerous. The drop of cross beam components could cause serious damage or even death. Please make sure that the jack has supported fully the cross beam components before the removal.

OVERHAUL OF THE FRONT SUSPENSION

Installation of the front axle

Cherry adopts the divided steering drive axle as the front axle. The suspension is the model of shock absorber (also called MacPherson) independent suspension. The front suspension of A15RHD model has the functions of both driving and steering. The top of the suspension is connected with the vehicle body while the bottom with the steering knuckle. The wheel camber is adjusted through the joint bolt of the suspension the steering knuckle. The sub-frame enhances the stability and comfortability of the vehicle through the connection of the control arm ball pin and the hinge by adopting the elastic components.

Overhaul of the front suspension

- When overhaul the front suspension, please do not weld or remodel the support and guide devices of the front suspension.
- Use the special purpose tools to remove the joint bolts or nuts. Make sure the tightening torque fits the specified value.
- When install the sub-frame to the vehicle body, the sequence of tightening the joint bolts is the rear left bolt, the rear right bolt, the front left bolt and the front right bolt last.
- Check the position of steering wheel and measure the data of front wheel alignment after installation.

Overhaul of front shock absorber assy

- Structure of the front shock absorber (shown as the illustration)

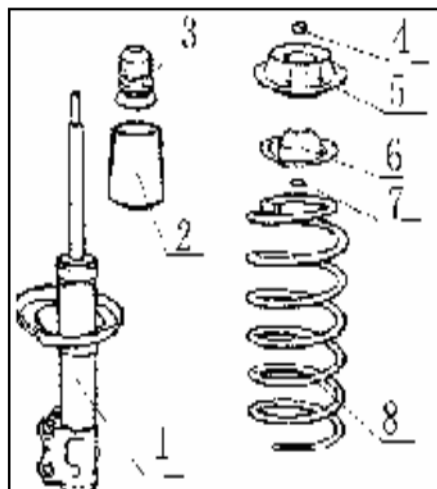
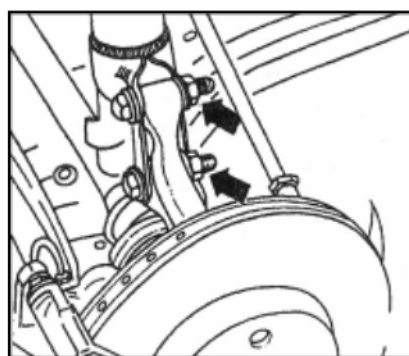


Illustration. The installation of the front strut assy

- 1-front shock absorber assy
- 2-front dust cover
- 3-front bumper block
- 4-slotted nut
40N•m
- 5-bearing and vibration isolator assy
- 6-front spring top tray
- 7-washer
- 8-front coil spring



Removal of the front shock absorber assy

Precaution: Before the procedure below, the careless pull may lead the disconnection of the harness if the ABS vehicle speed sensor is not removed first. Therefore, before the following procedure, remove the ABS vehicle speed sensor (the axle side) first and fix it in a proper position in order to keep the sensor untouched during the vehicle maintaining.

- Remove the wheel. Then loosen the joint bolt of the propeller shaft and the brake disc.
- Use the special socket wrench to remove the joint bolt of the shock absorber strut and the steering knuckle arm. (shown as the illustration)
- Use special purpose tools to remove and install the shock absorber coil spring. (shown as the illustration) During the removal, push down the vibration isolator assy of the coil spring by puller first, compress the coil spring, and then loosen the piston rod nut to release the tension of the coil spring.

Caution: The removal of the piston rod nut is extremely dangerous, because the shock absorber and the spring will burst out under tremendous pressure which could cause injury or even death. Please make sure the shock absorber is fixed properly before the removal of the piston rod nut.

Installation of the front shock absorber (refer to the installation illustration of the front strut assy)

- Assemble the front cover dust 2 with the front bumper block 3, and then cover them onto the piston rod of the front shock absorber 1.

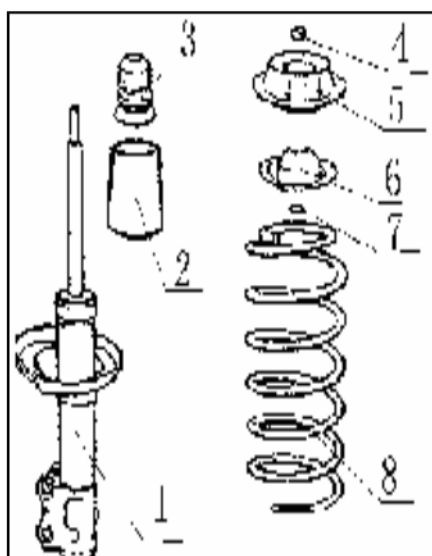
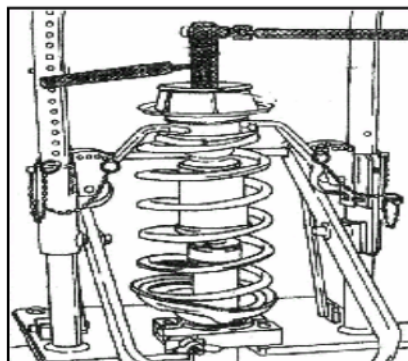


Illustration. The installation of front strut assy

- 1-Front shock absorber assy
- 2-Front dust cover
- 3-Front bumper block
- 4-Slotted nut 40N•m
- 5-Bearing and vibration isolator assy
- 6-Front spring top tray
- 7-Washer
- 8-Front coil spring

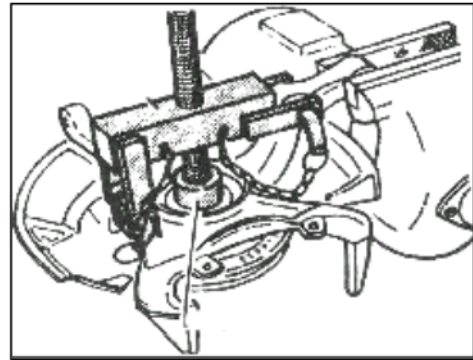
----Set on the front coil spring 8 and compress it less than 200~220mm.

----Amount the washer 7, the front spring top tray 6, the bearing and vibration isolator assy 5 in sequence, and tighten the slotted nut 4 to the specified torque (40N•m), then loosen the compressing tools on the coil spring.

Precaution: Please note that the two ends of the front coil spring should reach the corresponding locating positions of the spring trays.

Inspection of the shock absorber: The methods for checking the shock absorber are as following:

----Method of hand pressing the vehicle body. Shake the vehicle body for times on the side of the shock absorber which required to be checked and feel whether it is available. After the pressing, the vehicle will shake 2-3 times and then stop, which means the shock absorber works well.



----Method of observation. The shock absorber should not leak oil at outside appearance. A little oil stain is normal. If there is serious leakage, the shock absorber should be replaced.

----Method of touch. After long time running, touch the exterior of the shock absorber to check whether it is hot. If not hot, the shock absorber is in trouble.

----Method of pulling and pressing. Place the piston rod of the shock absorber upwards, then pull and press it by hand for times and check:

a whether there is a force during pulling and pressing which means the force is large while pulling up and small while pressing down.

b whether there is idle stroke during pulling and

pressing which means there is a force in lower part and not abruptly in upper part while pulling; there is a force in lower part and not in upper part while pressing.

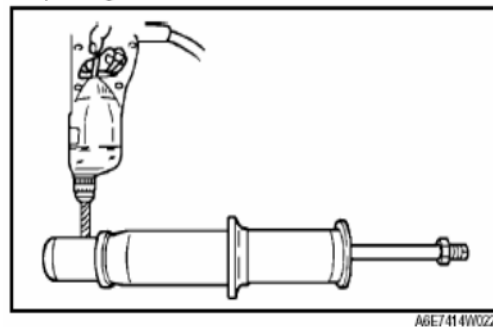
- c whether the shock absorber is locked and unable to pull.
- d whether the piston rod of shock absorber is severely loose.

Note: The above phenomenons indicate the failures of the shock absorber.

Deal with the front shock absorber

Caution:

- **Whenever drilling on the shock absorber, please wear the goggles. The air pressure in the shock absorber could probably blow the metal flakes into eyes or face.**



- Clamp the shock absorber on flat ground or point the piston downwards to the clamped absorber.
- Drill a hole of 2-3mm diameter at a distance of 20-30mm to the bottom of the tube in order to emit the air of the tube.
- Turn the shock absorber to make the hole downwards.
- Move the piston rod up and down for times to concentrate the oil, then cut the tube at the end.
- Process the waste oil according to the waste disposal method.

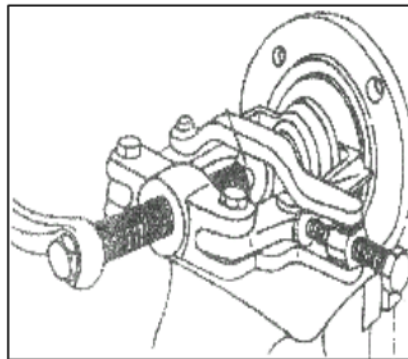
Note:

- The shock absorber air is nitrogen.
- The shock absorber oil is mineral oil.

REMOVAL AND INSTALLATION OF THE FRONT WHEEL BEARING

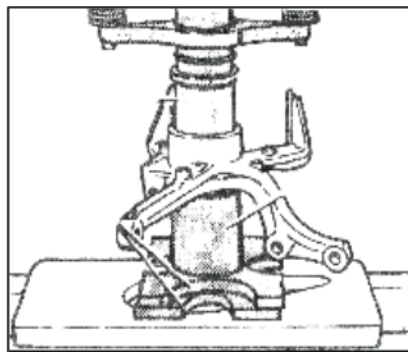
Removal:

- Remove the front brake disc and the dust plate, and then extrude the hub.
- Remove the spring retainer of both sides and extrude the wheel bearing. (shown as the illustration)
- Pull out the bearing inner race. Use the puller with hoop to pull the wheel bearing inner race out of the wheel hub. (shown as the illustration)



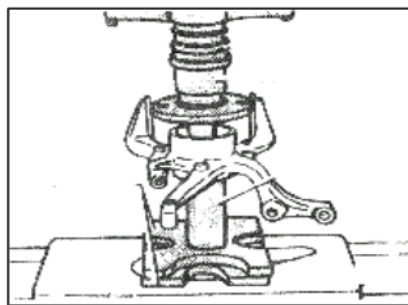
Inspection:

- After all the components are disassembled, please clean and check them, and replace them with new ones if necessary.
- If the working surface of the brake disc wears severely beyond the specified value (wearing limit: 10.0mm), please replace it with a new one.



Caution: Do not exceed the wearing limit.

- If the dust plate is severely deformed, please replace it with a new one.
- If the hub spline wears severely and looses, please replace it with a new one.
- If the spring retainer is not available, please replace it with a new one.
- If the wheel bearing is damaged, please replace it with a new one.



Installation and adjustment

- Set the outer spring retainer first, apply the lubricating grease onto the wheel bearing holder and then press the bearing down to the limit position, as shown in the illustration, and fix the inner spring retainer last.
- Adjust the split positions of the inner and outer spring retainer so as to make their difference 180°. Then rotate the bearing inner

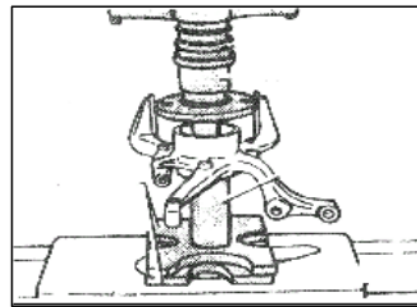
race and observe whether it runs normally.

----Apply the lubricating grease on the hub spline and the bearing neck, and then press the hub into the bearing.

----Tighten three M6 bolts to fix the dust plate with the tightening torque of 10N·m.

----Use the fuzz-free cloth to clean the working surface of the brake disc. If there is oil stain on the surface, clean it with ethanol. And then install the brake disc.

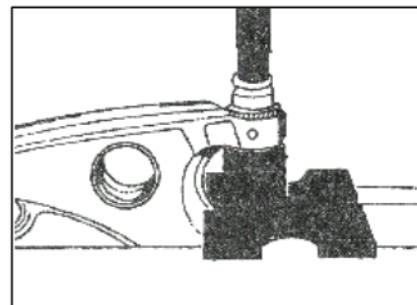
----Rotate the brake disc and observe whether there is lock or abnormal noise.



OVERHAUL OF THE LOWER CONTROL ARM

Check the status of damage, crack and bend of the control arm.

Replace the ball joint and the rubber cover of the lower control arm if they loose or wear.



Replace the front housing of the lower control arm

----Press out the front housing of the lower control arm. (shown as the illustration)

----Apply the lubricating grease before installing the front housing of the lower control arm.

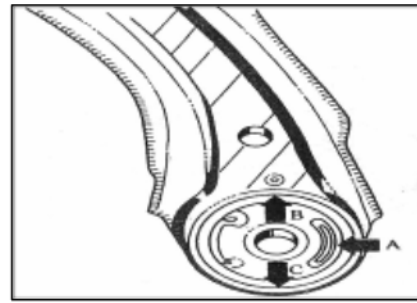
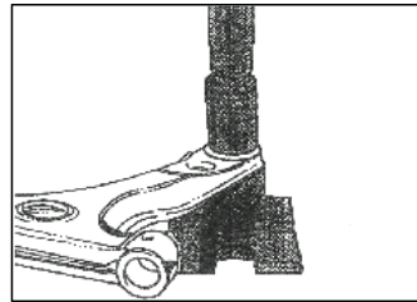
----Press in the front housing of the control arm. (shown as the illustration)

Replace the rear housing of the lower control arm

----When pressing out the rear housing of the lower control arm, if the elastic housing locks due to rust, please cut away the rubber on outer circle, saw off the steel cover, and then press out the elastic housing. (shown as illustration)

----The installing position of the elastic housing of control arm is shown as the illustration. The arrow B or C points at the upper pit on the lower control arm, and the kidney-shaped interspace on the housing (arrow A) points to the vehicle center.

----Use the special purpose tools to press in the rear housing of the control arm.



REAR AXLE AND REAR SUSPENSION

Longitudinal bracket rear axle and rigid axle suspension are employed in Chery. The wheels on both sides are connected with the vehicle body by an integrated rear axle. The metal rubber holder for the rear axle is a type of holder which the trace is adjustable. It is almost the rigid connection in longitude and can only deform in lateral which ensures that the rear axle cannot turn in axial direction. Therefore, the rear axle processes the function of preferable control of the vehicle stability at high speed.

REMOVAL AND INSTALLATION OF THE REAR AXLE ASSY

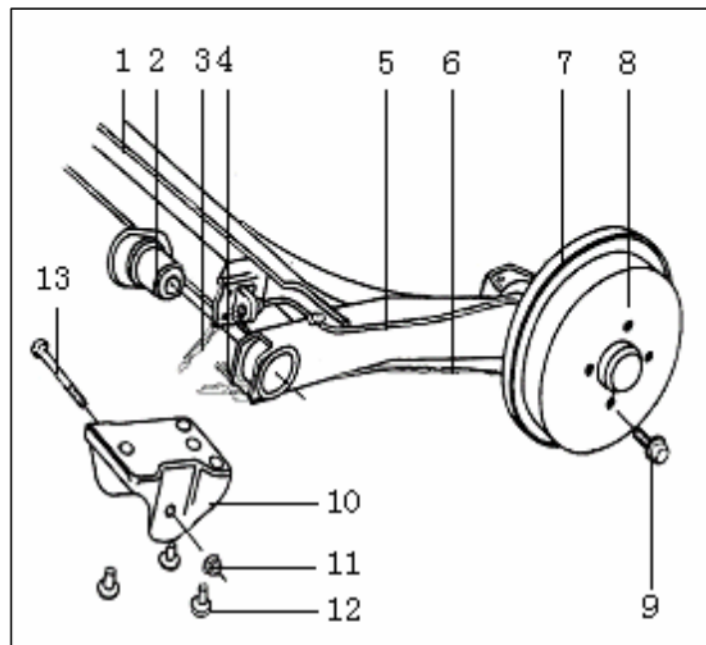


Illustration. Rear axle assy

- | | | |
|---------------------------|--------------------------------------|----------------------------|
| 1. Rear axle welding assy | 2. Metal rubber holder | 3. Rear brake hose |
| 4. Hand brake cable clip | 5. Left brake pipe assy of rear axle | 6. Hand brake cable |
| 7. Braker | 8. Brake drum | 9. Tire set bolt (110 N·m) |
| 10. Rear axle bracket | 11. Nut (60 N·m) | 12. Bolt (70 N·m) |

Installation of the rear axle assy:

----Installation of the metal rubber holder:
press the metal rubber bush 2 into the axle body, and apply pressure till the edge of metal rubber bush reaches the solid axle.

----Use the bolt for hole 13 of the metal rubber holder to connect the two rear axle brackets. The standard tightening torque of the nut is 60 N·m; (shown as the picture)



----Install the braker, the brake drum and the axle shaft well;

----Connect the left and the right brake pipe assy of the rear axle with the left and the right braker assy respectively, and then use the pipeline clip to fix them on the rear axle. Meanwhile, maintain the connection between the reed and the rear brake hose by the rear axle bracket. The tightening torque is 13-19 N·m; (shown as the picture)



----Use the clip and the brake cable clip set on the rear axle to fix the hand brake cable. (shown as the picture)



Precaution: Before the procedure below, the careless pull may lead the disconnection of the harness if the ABS vehicle speed sensor is not removed first. Therefore, before the following procedure, remove the ABS vehicle speed sensor (the axle side) first and fix it in a proper position in order to keep the sensor untouched during the vehicle maintaining.

Caution: The removal of the rear axle is extremely dangerous. The drop of the rear axle could cause severe damage or even death. Please make sure that the jack has supported fully the rear axle before the removal.

REMOVAL AND INSTALLATION OF THE REAR SHOCK ABSORBER ASSY

The structure of rear shock absorber assy is shown as the illustration:

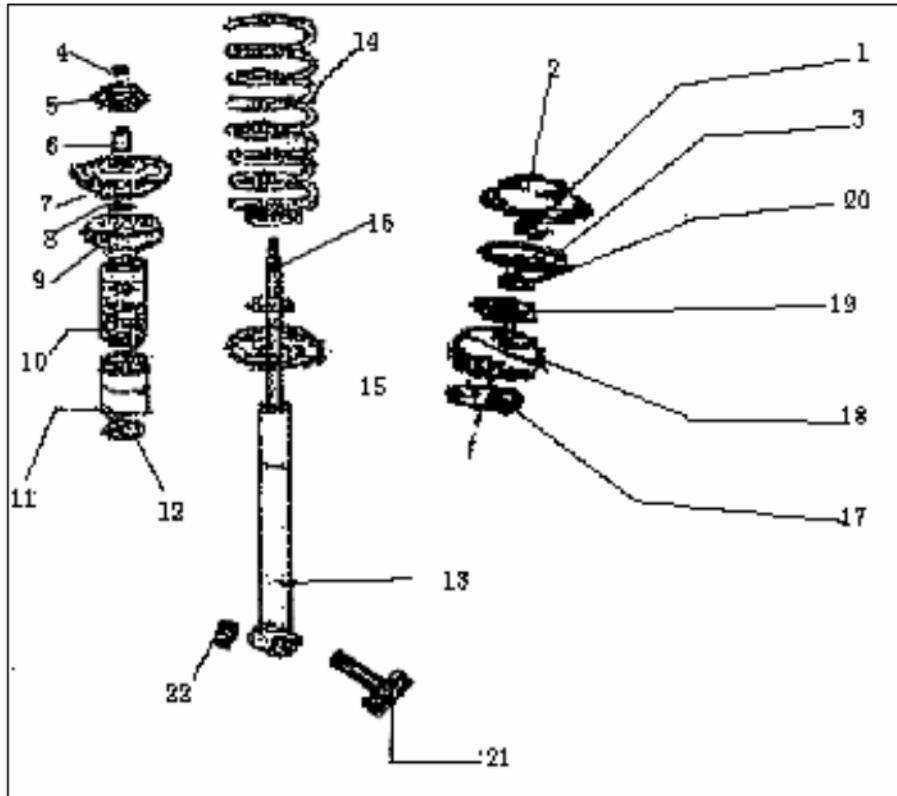


Illustration. Rear shock absorber assy

- | | | |
|-----------------------------|-----------------------------|------------------------------|
| 1 Hexagon thin nut 15N • m | 2 Rear strut upper cover | 3 Belleville washer |
| 4 Hexagon thin nut 15N • m | 5 Rubber bearing block II | 6 Bearing sleeve |
| 7 Rear spring upper holder | 8 Locating ring | 9 Rear spring upper soft pad |
| 10 Rear bumper block | 11 Dust cover | 12 Valve cap |
| 13 Rear shock absorber assy | 14 Rear coil spring | 15 Rear spring bottom tray |
| 16 Bottom tray bearing pad | 17 Bowl washer | 18 Rubber bearing block I |
| 19 Support disc | 20 Hexagon thin nut 25N • m | 21 Bolt |
| 22 Nut 70 N • m | | |

Precaution: Before the procedure below, the careless pull may lead the disconnection of the harness if the ABS vehicle speed sensor is not removed first. Therefore, before the following procedure, remove the ABS vehicle speed sensor (the axle side) first and fix it in a proper position in order to keep the sensor untouched during the vehicle maintaining.

Assemblage of the rear shock absorber (refer to the illustration of the rear shock absorber assy)

----Cover the rear spring bottom tray 15 onto the rear shock absorber assy 13, fix it on the rear shock absorber with the pressure of 9.5~10kN, and then set the bottom tray bearing pad with the pressure of 2~3kN.

----Cover the rear coil spring 14 and the valve cap 12 onto the piston rod of the rear shock absorber in sequence, and then set into the rear bumper block 10 and the dust cover 11 which have been assembled together;

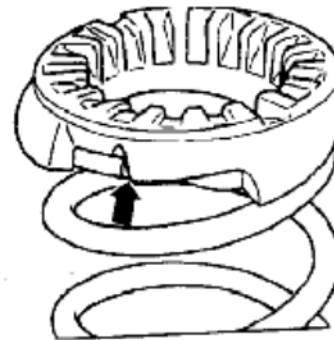
----Press the rear coil spring 14 to 280~300mm, and then fix the locating ring 8, the rear spring upper soft pad 9, the rear spring upper holder 7, the bearing sleeve 6, and the rubber bearing block II 5. Tighten the hexagon thin nut 4 to the specified torque (15N • m);

Installation of the shock absorber spring

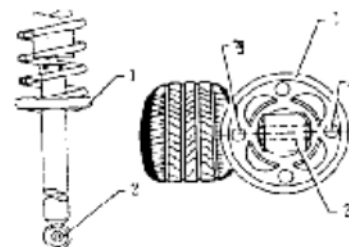
----As the illustration shows, aperture a must aim at the bush of the connecting sleeve 2 when install the rear spring bottom tray, otherwise the spring tray 1 would hit the tire under extreme steering condition.

----As the illustration shows, please pay attention to the installation position of the rear spring upper soft pad.

Installation of the rear shock absorber assy (refer to the illustration of the rear shock absorber assy)



Installation position of the spring holder



Installation position of the spring bottom tray

----Install upward the rear shock absorber assy from the vehicle body bottom and extend the piston rod into the carriage through the rear shock absorber holder;

----Inside the carriage, cover bowl washer 17, rubber bearing block 18 and support disc 19 onto the piston rod in sequence, and then tighten the hexagon nut 20 with tightening torque of $20\text{N} \cdot \text{m}$. (shown as the assy picture above)



----Lift the vehicle, and then put the connecting sleeve of the rear shock absorber into the corresponding installation position on the rear axle assy and then tighten the bolt 21 and the nut 22 with the specified torque ($70 \pm 7\text{N} \cdot \text{m}$)

----Fix the tire, ground the vehicle and tighten the hexagon thin nut 20 with the specified torque ($25\text{N} \cdot \text{m}$)

----Fix the belleville washer 3 and tighten the hexagon thin nut 1 with the specified torque ($15\text{N} \cdot \text{m}$)



----Fix the rear shock absorber upper cover 2, in order to keep away from the dust and dirt which could lead to abnormal wear on the piston rod. (shown as the picture)



OVERHAUL OF THE FRONT AND REAR AXLE

Trouble	Causes	Solutions
Deflecting of vehicle running	1. Different tire pressure of both sides 2. Half way releasing of front braker 3. Invalidation of front spring or housing 4. Inaccurate alignment of front wheel 5. Invalidation of shock absorber 6. Invalidation of metal rubber bushes of suspension 7. Deformation of vehicle chassis, frame or control arm	1. Adjust 2. Overhaul, adjust 3. Replace 4. Check, adjust 5. Replace 6. Check and replace the damaged bushes 7. Replace or align
Abnormal wear on tire	1. Inaccurate alignment of wheel 2. Serious wear or loose of metal bushes of suspension system 3. Looseness of steering link ball joint 4. Looseness of front wheel bearing	1. Check, adjust 2. Replace 3. Replace 4. Replace
Oscillation of vehicle	1. Low or different tire pressure 2. Inaccurate alignment of front wheel 3. Invalidation of stabilizer bar 4. Unbalance of wheels 5. Looseness of hub bearing 6. Improper adjustment of steering gear or serious wear of components	1. Adjust tire pressure 2. Check, adjust 3. Replace 4. Balance 5. Adjust 6. Adjust
Abnormal noise of chassis	1. Too small tightening torque of chassis sub-frame bolt 2. Looseness of rear axle bracket 3. Abnormal noise of front and rear shock absorber 4. Looseness of rear axle rubber hinge bolt looses	1. Tighten according to the specified torque 2. Tighten 3. Check, replace 4. Check, tighten