

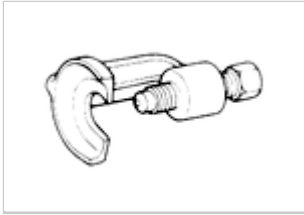
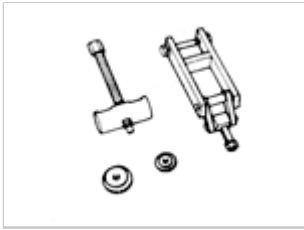
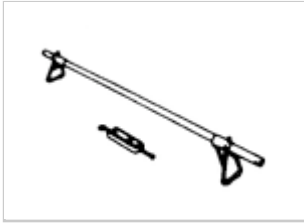


Driveshaft and Axle

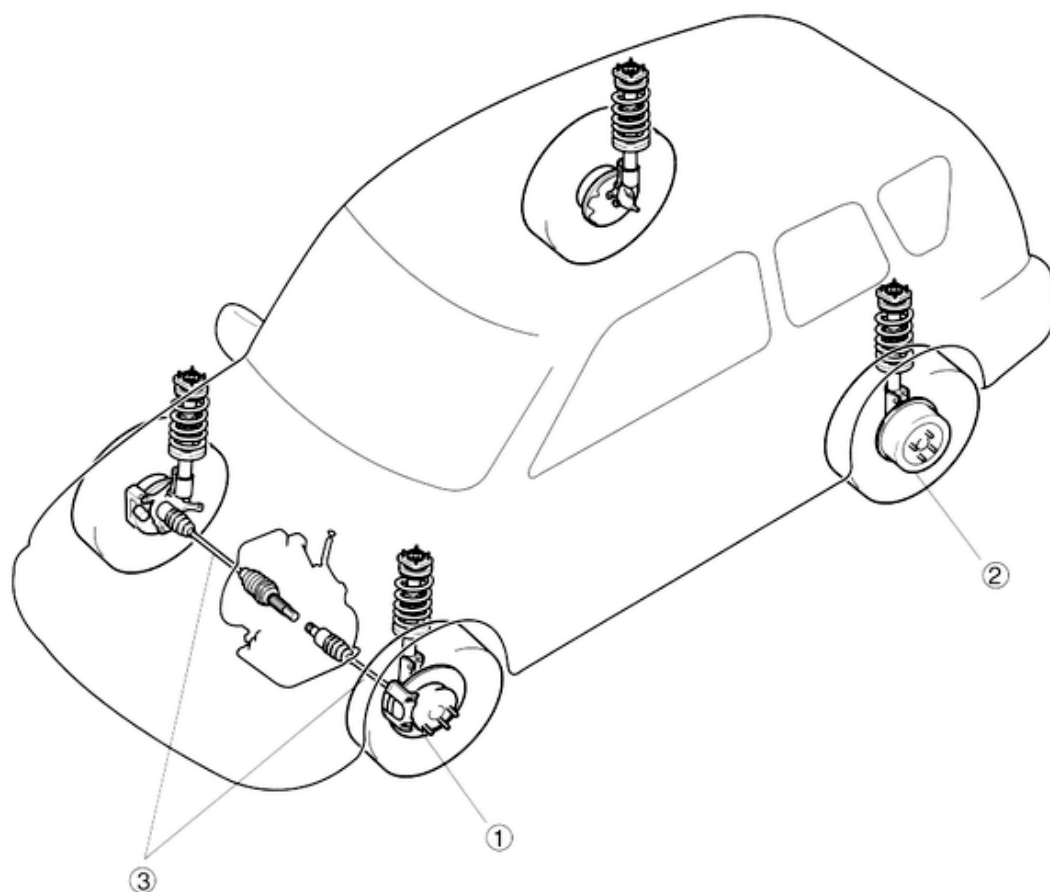
General Information



SERVICE SPECIAL TOOLS

Tool (Number and name)	Illustrator	Used
OK130 283 021 Ball joint puller		Used to remove ball joint.
OK930 331 AA0 Wheel hub puller		Used to remove wheel hub.
OK201 170 AA0 Engine support		Used to support engine when transaxle removal.
OK993 331 016 Oil seal installer		Used to install oil seal
OK130 430 019 Flare nut wrench		Used to remove and install brake pipe

DESCRIPTION AND OPERATION



(1) Front axle
(2) Rear axle

(3) Front driveshaft

Front axle

The front suspension consists of MacPherson struts and a single wishbone lower control arm. The upper end of each strut is suspended from body's inner fender with a steering knuckle bolted to lower end of the strut. A forged steering knuckle bolts to shock absorber.

Low ball joint is pressed into control arm and is attached to steering knuckle. Wide stance control arms are supported by rubber bushings at each end. Body lean on turns is controlled by a hollow stabilizer bar that connects to both front strut. Front wheels are attached to front hub and rotor assemblies. Front hub and rotor assemblies are supported by one-piece roller bearings mounted in steering knuckle. wheel bearing is pressed into wheel bearing assembly.

Rear axle

Rear suspension is fully independent utilizing a rear MacPherson strut at each wheel. A fored rear spindle bolts to shock absorber, double rear lateral links, and a single trailing arm.

Both lateral links and trailing arm have rubber bushings at each end. Lateral links are attached to rear sub-frame and spindle with a common bolt and nut assembly at each end. Trailing arm bolts to spindle and a bracket on floorpan.

NOTICE

If a rear suspension component becomes bent or damaged, do not attempt to straighten it. Always replace with a new part.

Lateral links, trailing arms, and spindles are normally replaced only when part has been damaged or when vehicle has been involved in an accident. If a suspension part has been damaged, be sure to check underbody dimensions of vehicle. If bearing requires service, it must be replaced as an assembly.

Driveshaft

Halfshafts are mechanical links that transfer engine torque from transaxle and differential to front wheels. At transaxle end, halfshafts are splined to differential side gears. Disengagement of left shaft from gear is prevented by an expanding spring steel circlip expands into a counterbore machined into back side of gear.

Wheel end of halfshafts are splined to wheel hubs which are supported on one-piece wheel bearings.

Disengagement of shaft from wheel hub is prevented by a staked halfshaft attaching nut. Backlash between wheel hub and halfshaft is eliminated by splines. Wheel hub splines are machined straight while halfshaft splines are machined with straight helical cut.

Differences in splines provide a tight backlash-free coupling without removal and installation problems associated with an interference fit.

Constant Velocity (CV) joints are installed at both ends of halfshafts. All in board CV joint are tripod joint type. Tripod joints are used to prevent transfer of engine vibration through driveshaft to vehicle body.

Constant velocity joints are necessary because halfshaft is required to transmit torque while compensating for suspension movement. As suspension moves, CV joints allow halfshaft to change length and to operate smoothly through varying angles.

For necessary flexibility, Birfield-type CV joints use three balls mounted on needle bearings and a spider. In both types of joints, outer race is machined into CV joint housing.

Tripod CV joints can be disassembled and serviced.

Other than CV joint boot, outboard Birfield CV joint is serviced only as an assembly with shaft.



GENERAL DIAGNOSTICS AND TESTS

Front axle

Problem	Possible cause	Action
Steering wheel vibration	Excessive wheel bearing play	Adjust or replace
	Damaged or worn wheel bearing	Replace
Pulling to one side	Excessive wheel bearing play	Adjust or replace
	Damaged or worn wheel bearing	Replace
Excessive steering wheel play	Excessive wheel bearing play	Adjust or replace
Linkage	Damaged or worn wheel bearing	Replace
	Insufficient grease on spline or joint of jointshaft	Lubricate or replace
	Bending of joint as shaft or drive shaft	Replace
	Worn joint shaft spline or drive shaft	Replace
	Insufficient grease on joint or spline of drive shaft	Lubricate or replace
	Worn drive shaft	Replace
Grease leakage from foot	Damage or tear of boot	Replace
	Malfunction or disassembly of boot band	Replace
	Excessive grease	Repair

Rear axle

Problem	Possible cause	Action
Steering wheel vibration	Damaged or worn wheel bearing	Replace
	Excessive wheel bearing play	Adjust or replace
Pulling to one side	Damaged or worn wheel bearing	Replace
	Excessive wheel bearing play	Adjust or replace
Excessive wheel play	Excessive wheel bearing play	Adjust or replace
	Damaged or worn wheel bearing	Replace



SPECIFICATIONS

Driveshaft and axle

Engine				TB DOHC			
Item				MTX		ATX	
Driveshaft	Type of joint	Inside		Tripod			
		Outside		Ball joint			
	Length of joint	Left side		24.80in (630mm)		25.11in (638mm)	
		Right side		25.02in (635.7mm)		25.02in (635.7mm)	
	Shaft diameter	Right side		0.95(ø)in (24mm)			
		Left side		0.95(ø)in (24mm)			
	Number of teeth	Left side	BJ side	28		28	
			TJ side	28		24	
		Right side	BJ side	28		28	
			TJ side	28		28	
Front axle		Axis direction bearing play		0.003in (0.1mm)			
Rear axle		Axis direction bearing play		0.003in (0.1mm)			

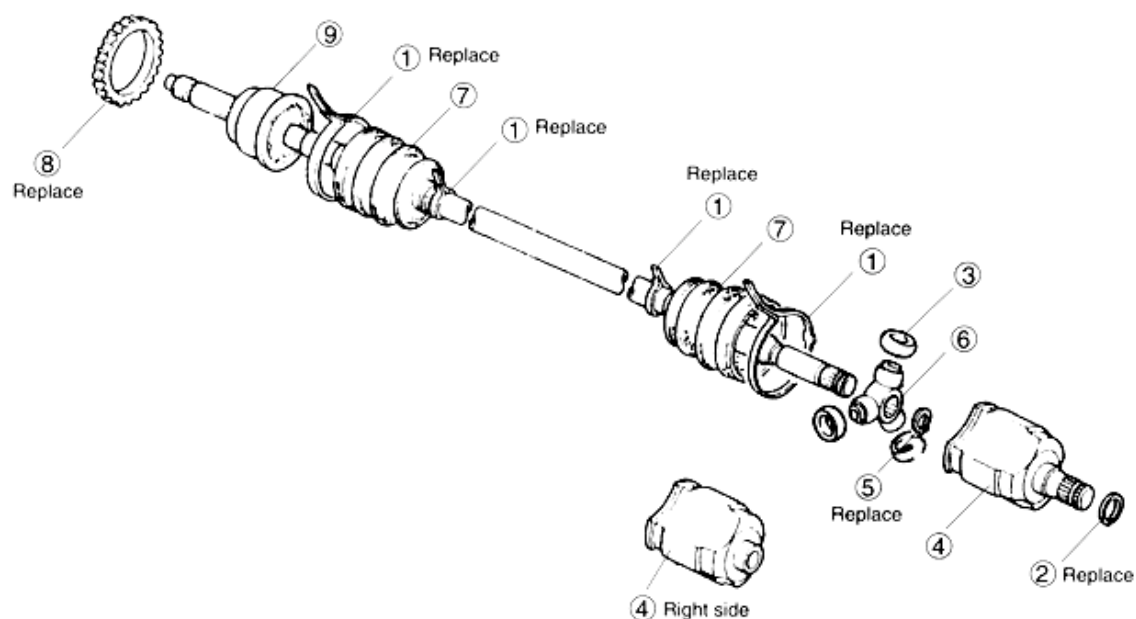


Driveshaft Assembly

Front Driveshaft



COMPONENT



(1) Boot band

(2) Clip

(3) Free ring

(4) Tripod housing (outer ring)

(5) Snap ring

(6) Tripod joint

(7) Boot

(8) ABS sensor rotor (ABS equipped vehicle)

(9) Shaft and ball joint assembly



DASSEMBLY

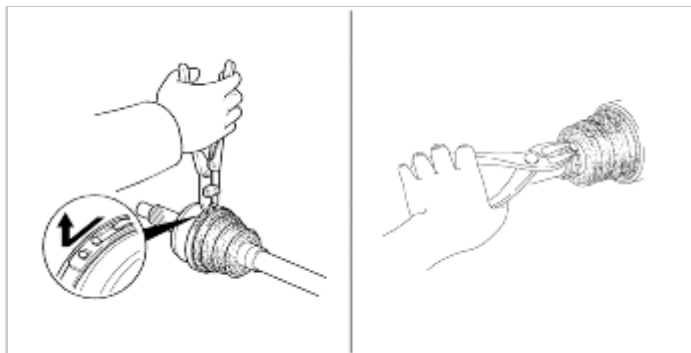
CAUTION

- 1) Install a protective material in a vice and secure CV joint in the vice.
- 2) Keep dust or foreign material from joint during procedure.
- 3) Do not disassemble wheel side ball joint.
- 4) Do not wash joint unless disassembling it.

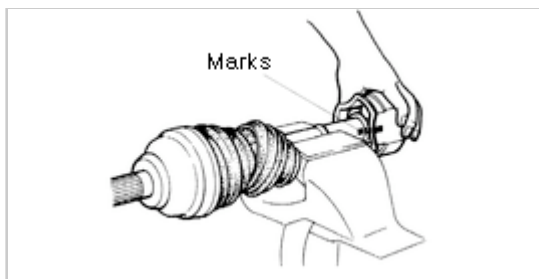
NOTICE

Do not disassemble boot band on wheel side unless necessary.

1. Using a boot band tool draw hook together and remove the boot band.
2. Using side cutters, cut small boot band and remove them.
3. Slide boot along shaft to expose joint.



4. Mark tripod housing and shaft for proper reassembly.

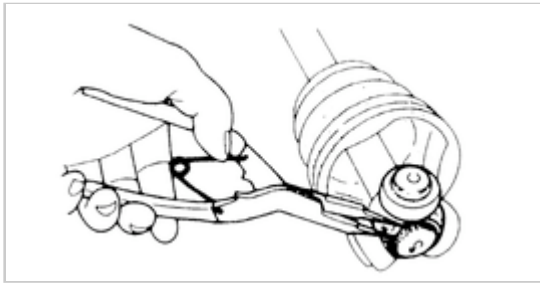


5. Remove outer ring.
6. Mark shaft and tripod joint for proper reassembly.
7. Remove snap ring snap-ring pliers.

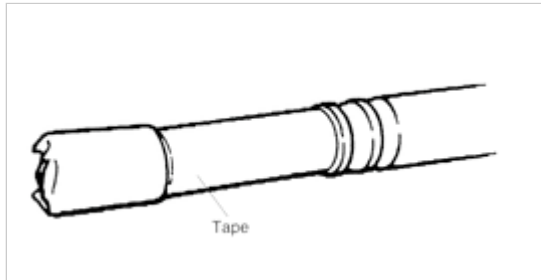
NOTICE

Do not damage needle bearings.

8. Drive tripod joint shaft with a bar and a hammer.



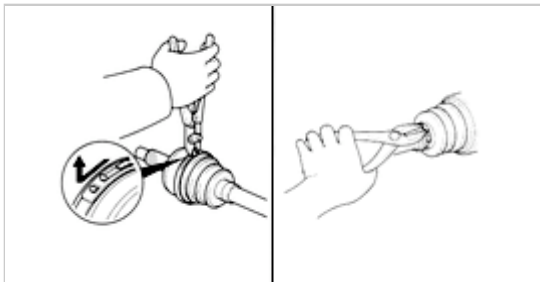
9. Wrap splines of shaft with tape to prevent damaging boot.
10. Slide boot off shaft.



NOTICE

Do not remove boot from outer joint unless necessary.

11. Using a boot band tool, draw hooks together and remove the boot band.
12. Using side cutters, cut boot band and remove them.
13. Cover splines with tape and remove boot.



REASSEMBLY

NOTICE

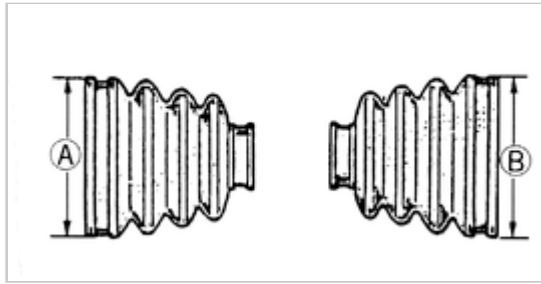
Check direction of sensor rotor.

1. Assemble a new sensor rotor to driveshaft by using suitable.

NOTICE

Boot on wheel side of driveshaft is different from boot on differential side of driveshaft.

Item	TBDOHC
Wheel side (B)	3.72in (95.5mm)
Differential side (A)	3.46in (89mm)

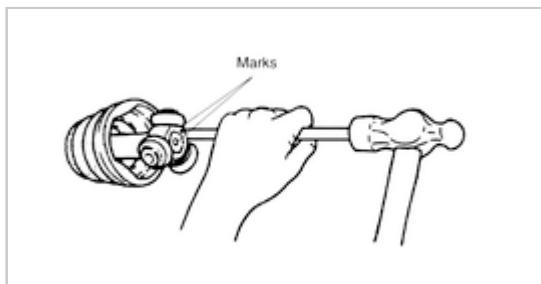


2. Cover splines of transaxle end tape.
3. Install inner dust boot.
4. Install outer boot.

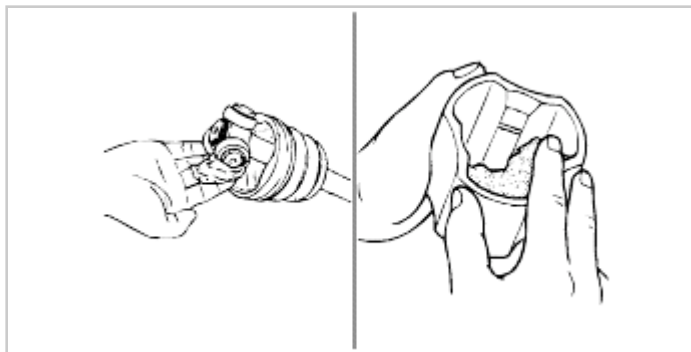
NOTICE

Do not damage bearing.

5. Align marks and carefully install tripod joint with a drift a hammer.
6. Install snap ring with snap-ring pliers.



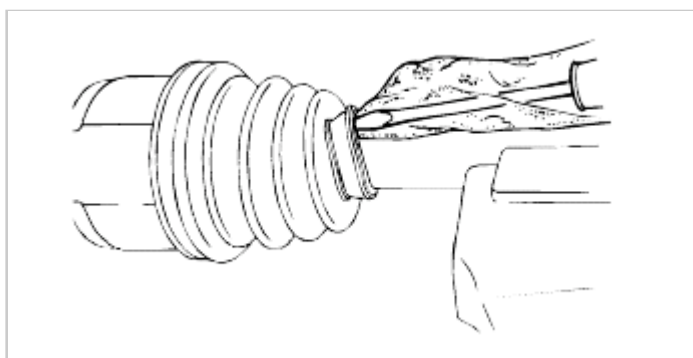
7. Apply grease included in rebuild kit to the tripod joint, outer ring and boot.
8. Install outer ring.
9. If outer boot was removed, fill it with correct quantity of specified grease.



Transaxle end : 4.94oz. (140g)
Wheel end : 4.58oz. (130g)

NOTICE

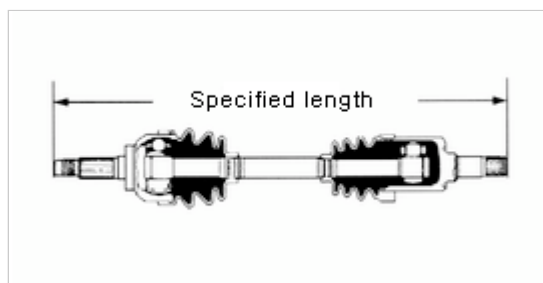
- 1) Be sure boots are not damaged.
- 2) Carefully lift up small end of boots to release any trapped air.



10. Measure length of driveshaft.

Length of driveshaft

Item	Right side		Left side	
	MTX	ATX	MTX0	ATX
TBDOHC	25.03in (637.7mm)	25.03in (635.7mm)	24.8in (630mm)	25.12in (638mm)

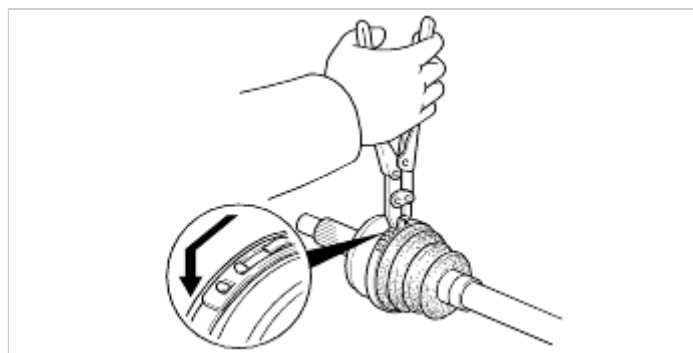


NOTICE

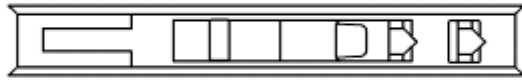
- 1) Always use new bands
- 2) Bands should be installed so that their pointed ends initially point in forward direction of rotation.

11. Using a boot band tool, place pincer jaws in closing hooks of boot band.

12. Secure clamp by drawing closing hooks together.

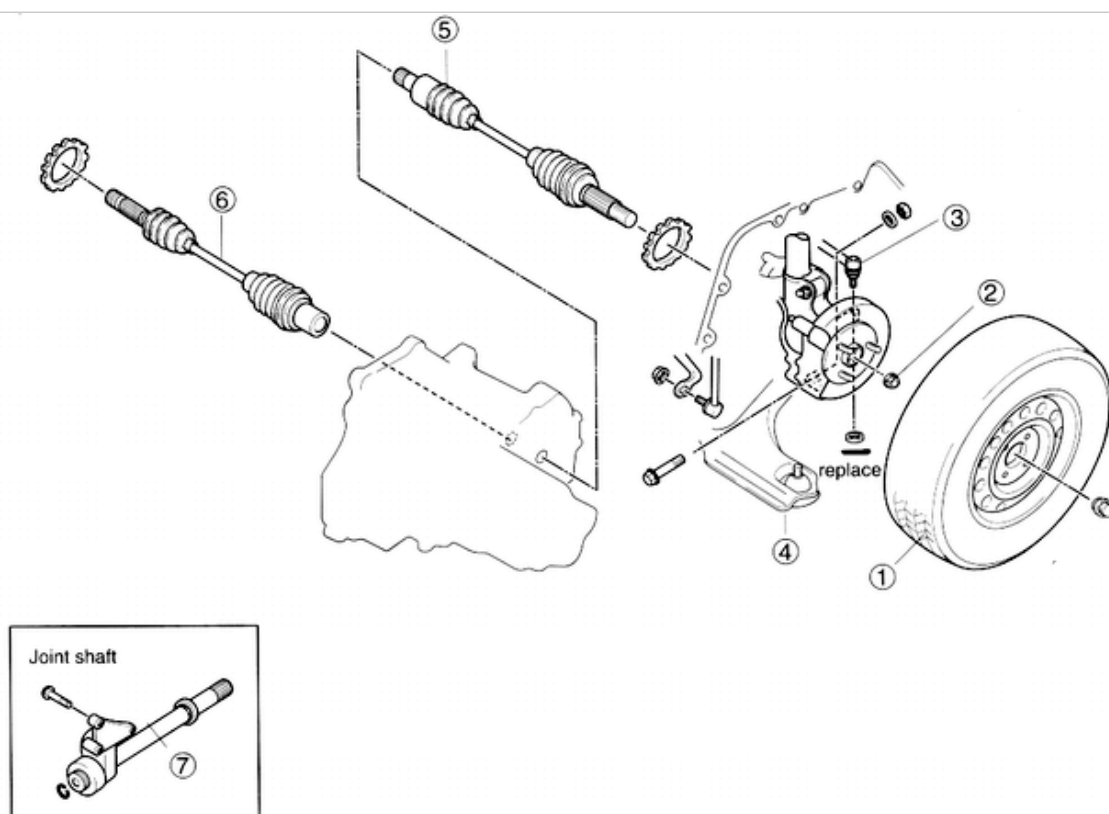


13. Check that the clamp at closed position is the same as in the illustration.





COMPONENT



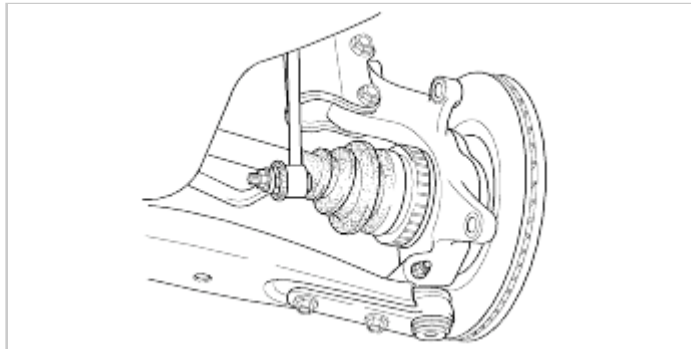
- (1) Wheel and tire
- (2) Locknut
- (3) Tie rod end

- (4) Ball joint
- (5) Left driveshaft
- (6) Right driveshaft
- (7) Joint shaft



INSPECTION

1. Raise vehicle and support it with safety stands.



2. Check dust boots on driveshaft for cracks, damage, leaking grease, or loose boot bands.
3. Check driveshaft for a bent condition, cracks, and wear of joints or splines.
4. Repair or replace driveshaft if necessary.
5. Lower vehicle.

REMOVAL

NOTICE

Drain transaxle oil before disassembly.

1. Raise vehicle and support it with safety stand.
2. Loosen and remove four wheel nuts.
3. Remove wheel and tire.
4. Remove locknut.

NOTICE

Do not damage dust boot.

5. Loosen and remove tie rod nut and disconnect tie end with SST (OK130 283 021).



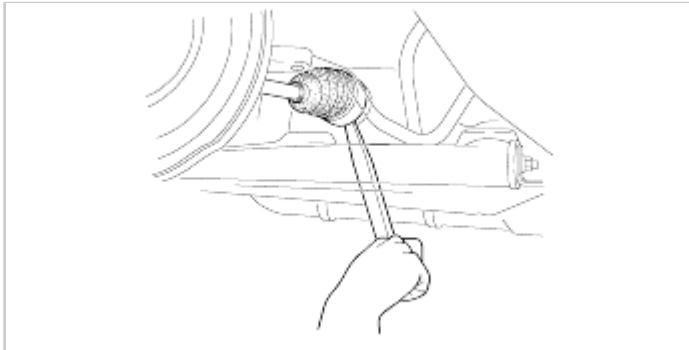
NOTICE

Do not damage dust cover or oil seal.

6. Loosen and remove bolt from knuckle and disconnect ball joint from knuckle.
7. Remove driveshaft from transaxle with a pry bar.
There will be an initial resistance until circular clip is collapsed and pulled into side gear.

NOTICE

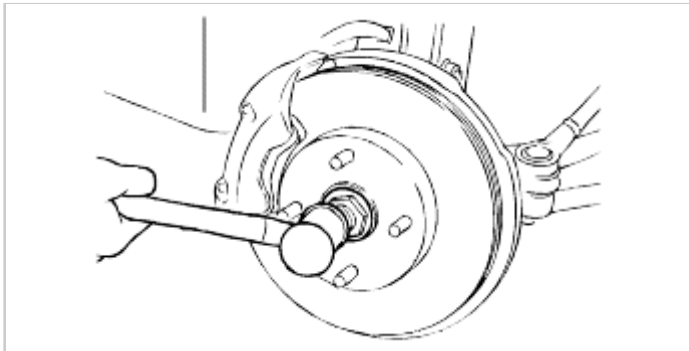
Do not damage the dust cover or oil seal.



8. Remove drivshaft from front hub after removing locknut.

NOTICE

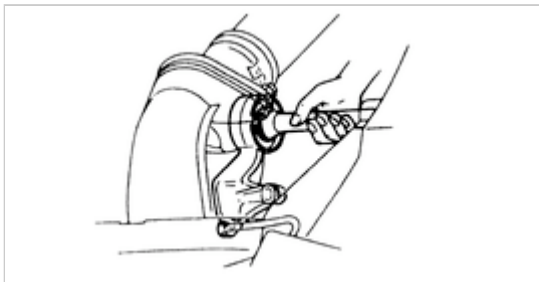
If driveshaft is frozen in front wheel hub, spray a penetrating solvent into splined area and then reinstall locknut so that it is flush with end of shaft. Tap nut a brass hammer to remove driveshaft.



9. separate right-side driveshaft from CV joint shaft by hammering on a brass pry bar inserted between them.



10. Loosen and remove three CV joint shaft bolts and pull CV joint shaft straight out.

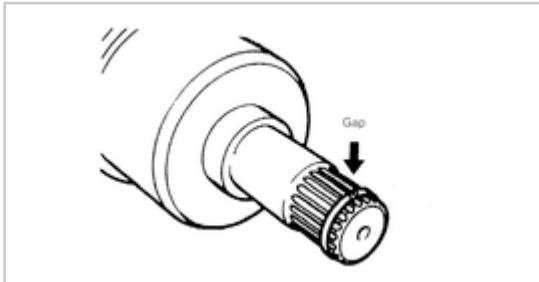


INSTALLATION

NOTICE

Do not damage dust cover or oil seal.

1. Install driveshaft with circular clip gap facing upward as shown.

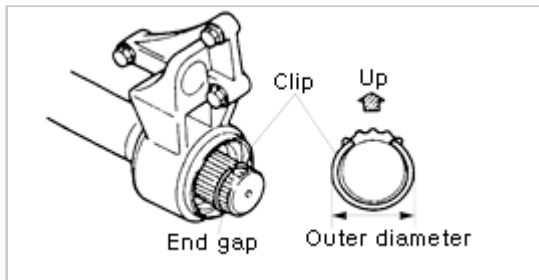


2. Install a new clip so that opening is facing upward.
3. Measure outer diameter of clip after installing and replace clip if it exceeds specification.

Outer diameter :

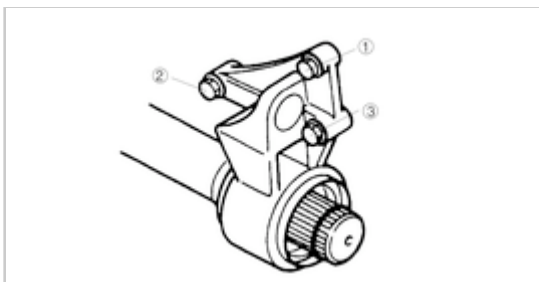
Manual transaxle : 1.22in (31mm)

Auto transaxle : 1.06in, (27mm)

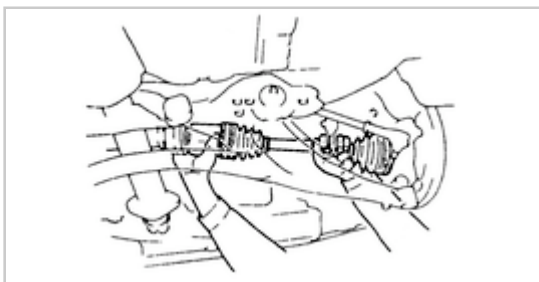


4. Install CV joint shaft support and tighten three bolts in order shown.

Tightening torque : 31~46lb-ft (42~62N·m, 4.3~6.3kg-m)



5. Push drivshaft onto CV joint shaft.
6. After installation pull front hub outward to verify that driveshaft is securely held by circular clip.



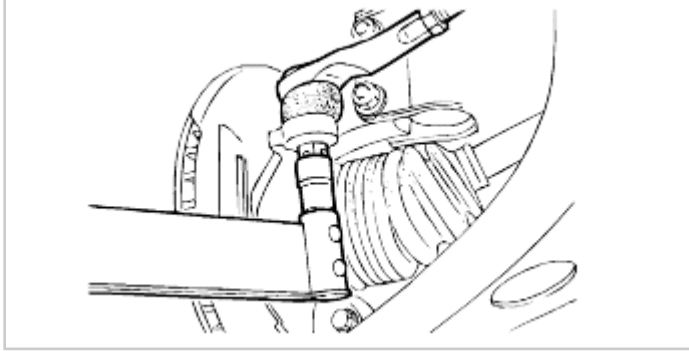
7. Apply transmission fluid oil around oil seal lip, and push driveshaft into transaxle.

NOTICE

Do not damage dust boot. Do not damage oil seal of trsaxle and CV joint shaft.

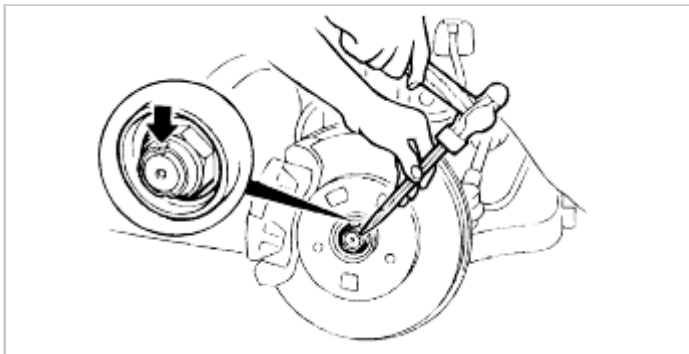
8. Install nut and secure it with a new cotter pin.

Tightening torque : 21~32lb-ft (29~44N·m, 3.0~4.5kg-m)



9. Install a new driveshaft locknut and stake it, as shown.

Tightening torque : 174~235lb-ft (235~319N·m, 24.0~32.5kg-m)



10. Install wheel and tire.

Tightening torque : 65~87lb-ft (88~118N·m, 9.0~12.0kg-m)

11. Lower vehicle.



Front Axle Assembly

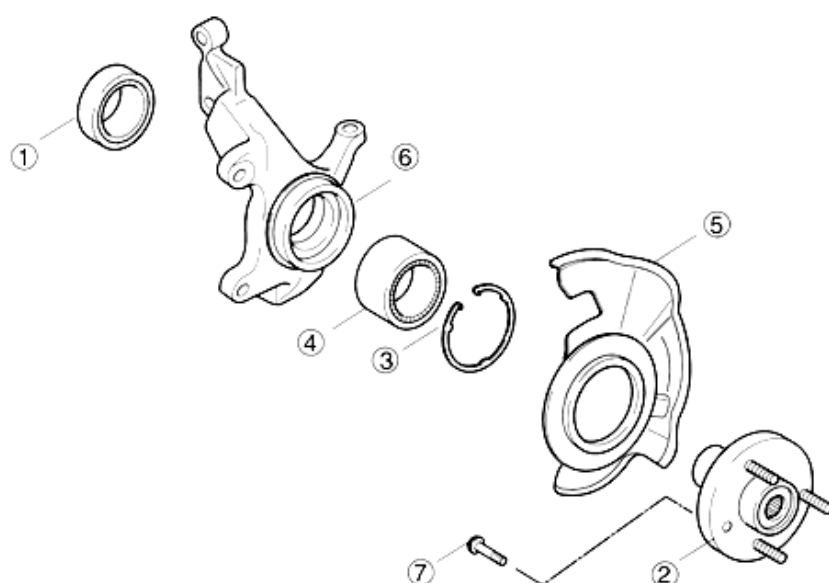


Front Axle Assembly

Front Hub / Axle



COMPONENT



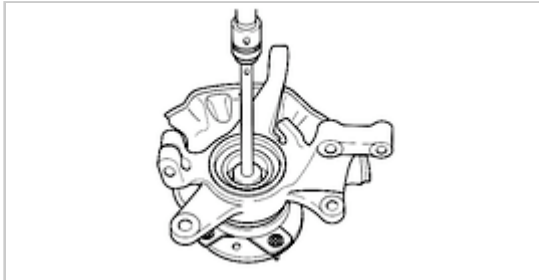
- (1) Oil seal (replace)
- (2) Front wheel hub
- (3) Retaining ring (replace)
- (4) Wheel bearing

- (5) Dust cover
- (6) Steering knuckle
- (7) Wheel stud



DISASSEMBLY

1. Remove oil seal from front wheel hub.
2. Remove front wheel hub assembly with suitable tool.



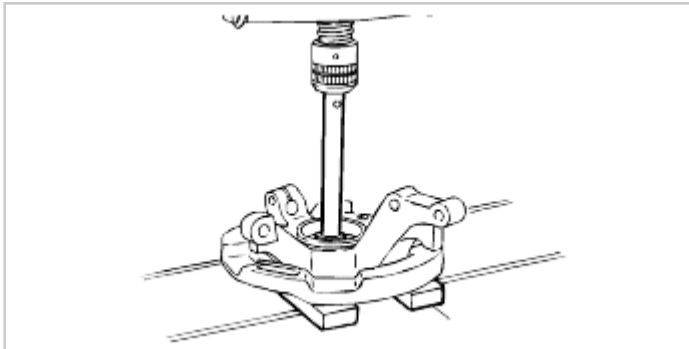
3. Remove retaining ring.

NOTICE

If the bearing inner race remains on wheel hub, grind a section of inner race until approximately 0.020in (0.5mm) remains. Remove race with a chisel.



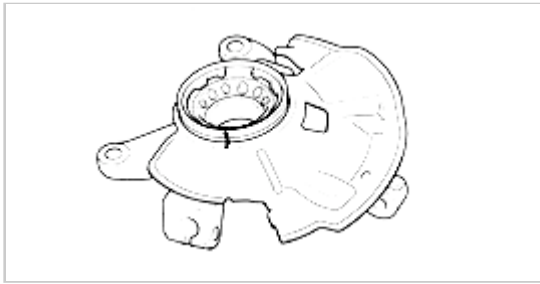
4. Remove wheel bearing suitable tool.



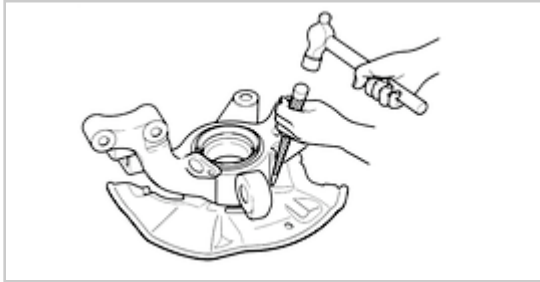
NOTICE

- 1) Do not remove dust cover unless necessary.
- 2) Do not reuse dust cover if removed.

5. Mark relative positions of dust cover and knuckle for proper reassembly.



6. Remove dust cover with a chisel.

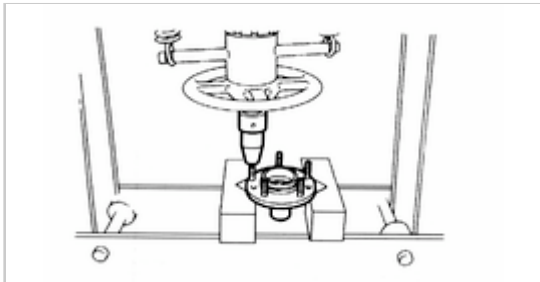


A.

NOTICE

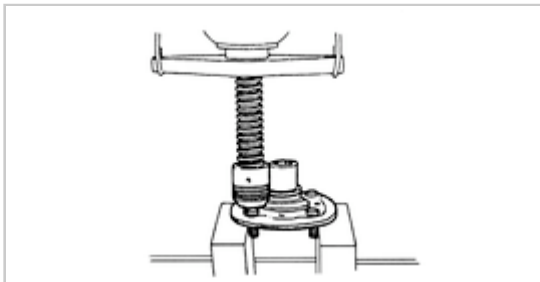
- 1) Do not remove wheel studs unless necessary.
- 2) Do not reuse wheel studs if removed.

7. Remove wheel studs with a press.

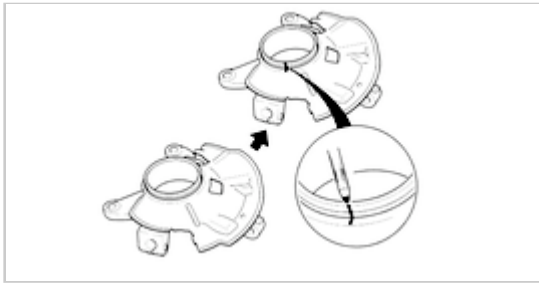


RESSEMBLY

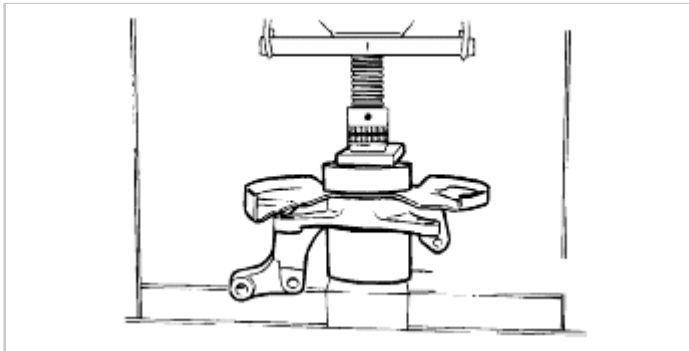
1. Press in new wheel studs.



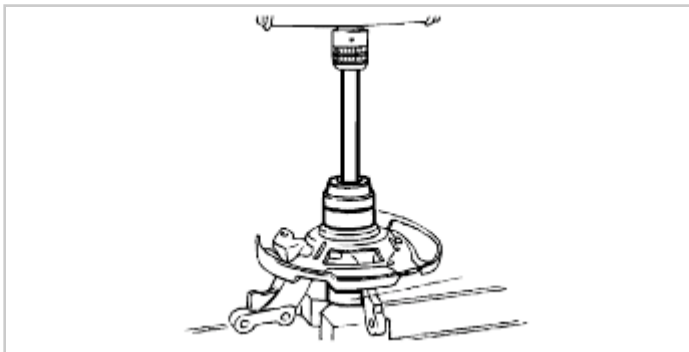
2. Mark new dust cover to match the removed dust cover.



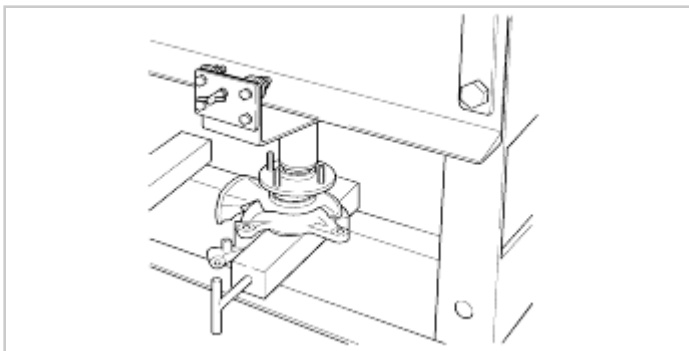
3. Align mark on new dust cover with knuckle.
4. Install new dust cover with suitable tool.



5. Install new wheel bearing with suitable tool.



6. Install front wheel hub assembly with suitable tool.



NOTICE

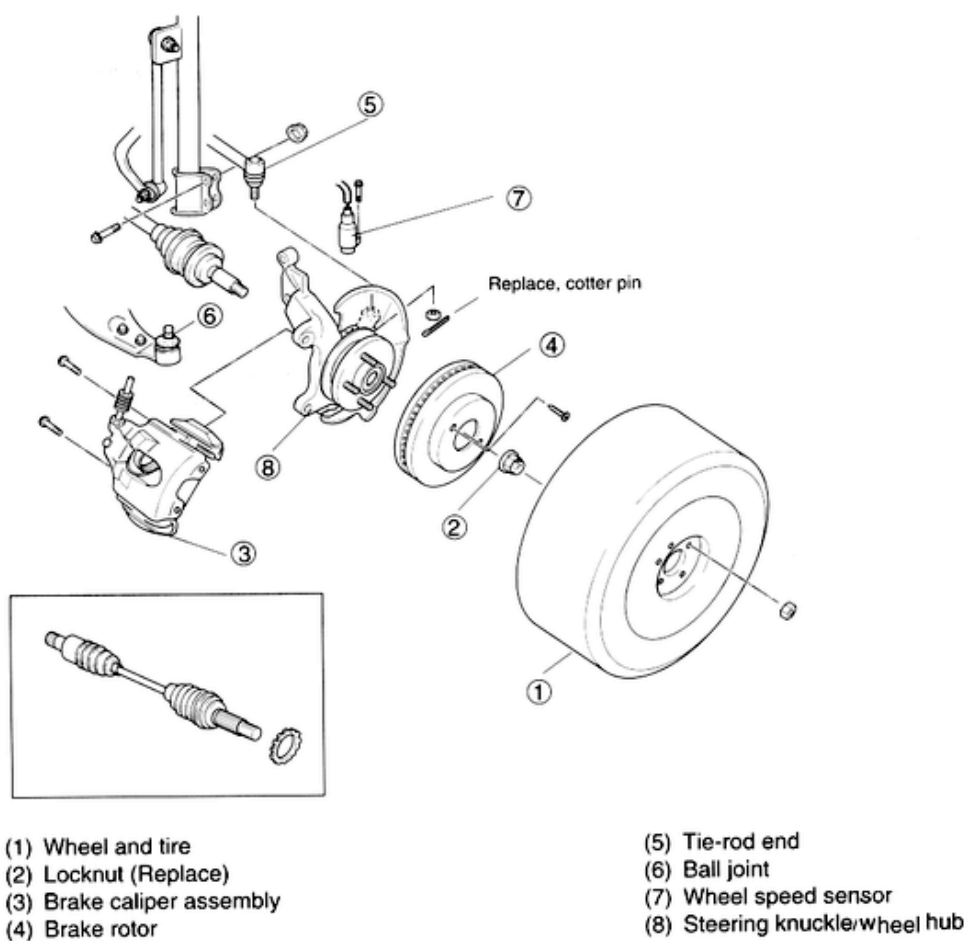
- 1) Use a new oil seal and apply grease to seal.
- 2) Install oil seal that it is flush with knuckle.

7. Install new oil seal with SST (OK993 331 016).





COMPONENTS



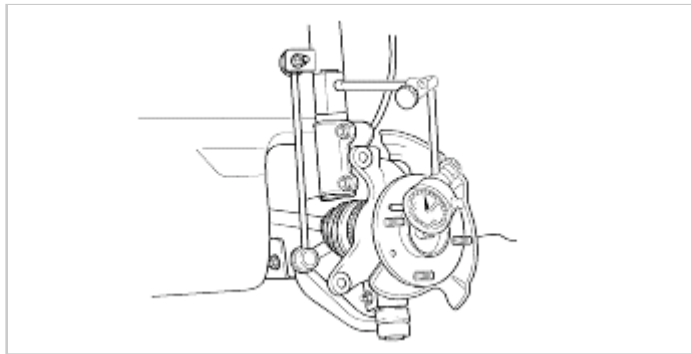


INSPECTION

Wheel bearing play

1. Raise vehicle and support it with safety stand.
2. Loosen and remove four wheel nuts.
3. Remove wheel and tire.
4. Loosen a locknut and two disk plate screws.
5. Remove brake caliper assembly and disk plate.
6. Install a dial indicator on wheel hub and push and pull hub to measure bearing play.

Maximum wheel bearing play : 0.002in (0.05mm)



7. Install brake caliper assembly and disk plate.
8. Tighten a locknut and two disk plate screws.

Tightening torque :

Locknut : 174~235lb-ft (235~319N·m, 24.0~32.5kg-m)

Rotor screw : 7~11lb-ft (10~15N·m, 1.0~1.5kg-m)

9. Install wheel and tire.
10. Tighten four nuts.

Tightening torque : 65~87lb-ft (88~118N·m, 9.0~12.0kg-m)

11. Lower vehicle.

REMOVAL

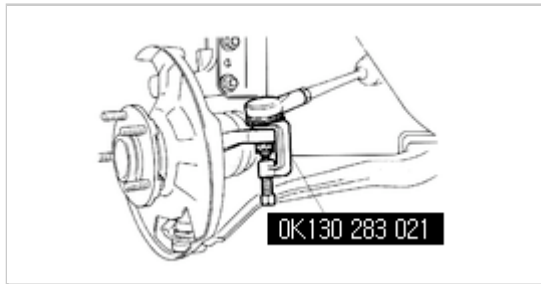
1. Raise vehicle and support it with safety stand.
2. Loosen four wheel nuts.
3. Remove wheel and tire.
4. Loosen a locknut and two brake rotor screws.
5. Remove brake caliper assembly and brake rotor.

NOTICE

Do not damage dust boot.

6. Remove wheel speed sensor.

7. Loosen and remove nut and disconnect tie-rod end with SST (OK130 283 021).
8. Disconnect ball joint of lower control arm from steering knuckle.
9. Remove steering knuckle and wheel hub.
10. Inspect all parts and repair or replace as necessary.



INSTALLATION

1. Install steering knuckle and wheel hub.
2. Connect ball joint of lower control arm to steering knuckle and tighten bolt and nut.

Tightening torque : 32~40lb-ft (43~54N·m, 4.4~5.5kg-m)

3. Install brake rotor to wheel hub and tighten two brake rotor screws.

Tightening torque : 7~11;lb-ft (10~15N·m, 4.6~6.9kg-m)

4. Install brake caliper assembly to steering knuckle and tighten two bolts.

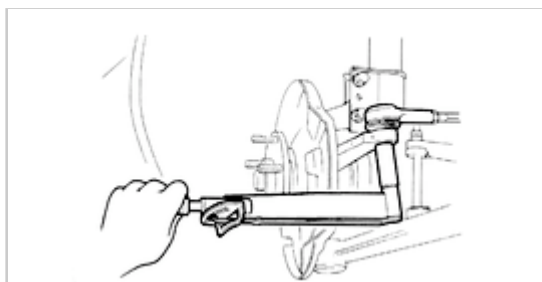
Tightening torque : 33~50lb-ft (45~65N·m, 4.6~6.9kg-m)

NOTICE

Do not damage dust boot.

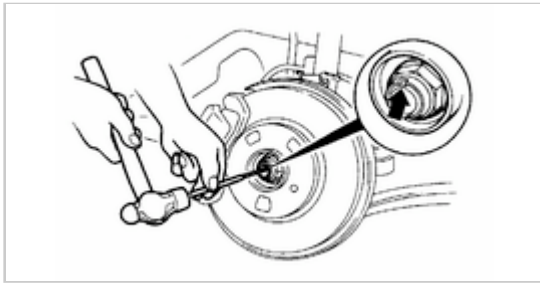
5. Install tie rod end steering knuckle.
6. Install nut secure it with a new cotter pin.

Tightening torque : 22~32lb-ft (29~44N·m, 3.0~4.5kg-m)



7. Install a new locknut and stake it, as shown.

Tightening torque : 174~235lb-ft (235~319N·m, 24.0~32.5kg-m)



8. Install wheel and tire.

9. Tighten four wheel nuts.

Tightening torque : 35~87lb-ft (88~118N·m, 9.0~12.0kg-m)

10. Install wheel speed sensor.

Tightening torque : 5.8~7.2lb-ft (7.8~9.8N·m, 80~100kg-cm)

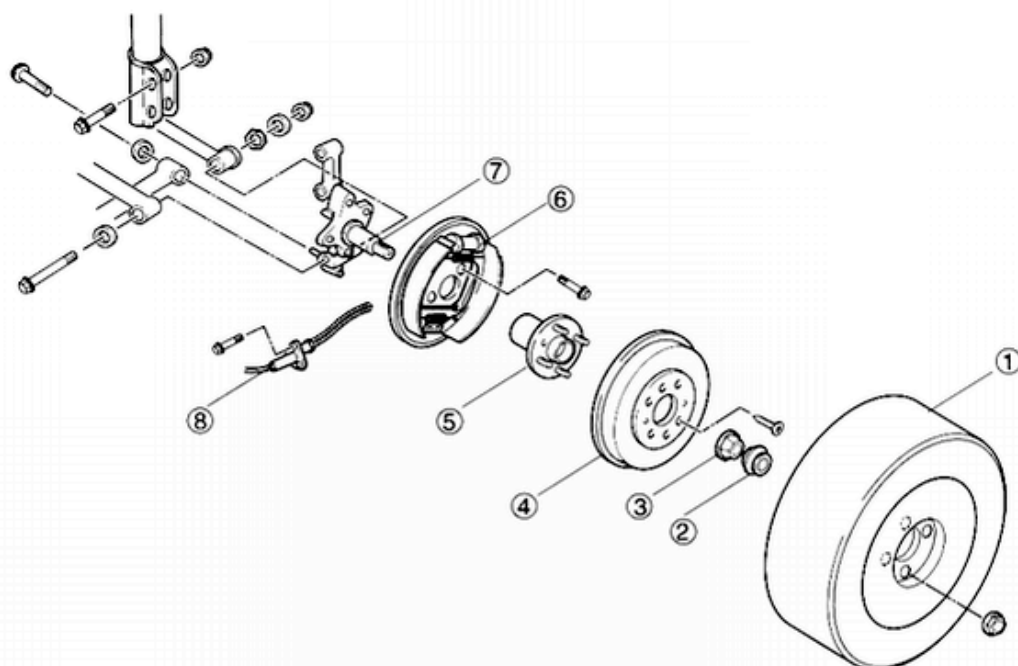
11. After assembly, check front wheel alignment.



Rear Axle Assembly



COMPONENT



- (1) Wheel and tire
- (2) Dust cap
- (3) Locknut (replace)
- (4) Brake drum (or disc)

- (5) Hub with bearing assembly
- (6) Rear brake assembly (drum or disc)
- (7) Spindle
- (8) Parking brake cable



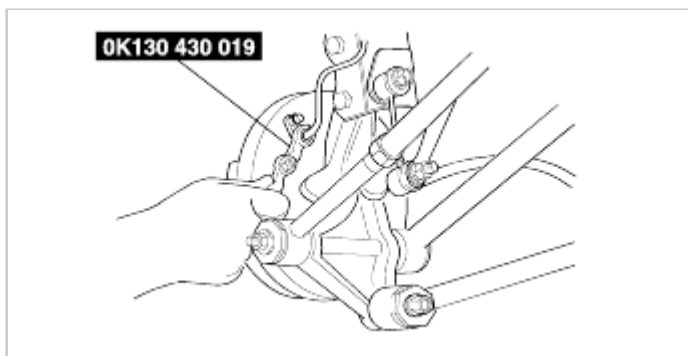
REMOVAL

1. Raise vehicle and support it with safety stand.
2. Loosen and remove four wheel nuts.
3. Remove wheel and tire.
4. Remove a dust cap, hub locknut and two brake drum screws.
5. Remove brake drum (or disk) from rear brake assembly.
6. Remove hub with bearing assembly.

NOTICE

After disconnecting brake line, plug it to prevent fluid leakage.

7. Disconnect brake line with SST(OK130 430 019).



8. Remove two bolts and remove rear brake assembly (drum or disc).
9. Disconnect two lateral links and trailing link from spindle.
10. Loosen and remove two struct bolts and nuts.
11. Remove spindle from strut assembly.
12. Check all parts, and repair or replace if necessary.

INSTALLATION

1. Install spindle to strut assembly and tighten two bolts and nuts.

Tightening torque : 69~86lb-ft (93~116N·m, 9.5~11.9kg-m)

2. Install two lateral links to spindle with bolt and then tighten nut.

Tightening torque : 69~86lb-ft (93~116N·m, 9.5~11.9kg-m)

3. Install trailing link to spindle and tighten trailing link bolt.

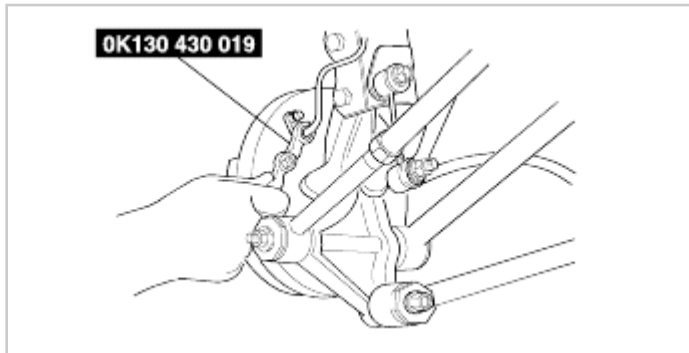
Tightening torque : 32~45lb-ft (43~61N·m, 4.4~6.2kg-m)

4. Tighten four rear brake assembly (drum or disc) bolts.

Tightening torque : 33~49lb-ft (45~67N·m, 4.6~6.8kg-m)

5. Tighten brake line with SST (OK130 430 019).

Tightening torque : 9~13lb-ft (13~18N·m., 1.3~1.8kg-m)



6. Install hub and bearing assembly.
7. Put brake drum (or disc) into rear brake assembly and tighten two screws.

Tightening torque : 7~11lb-ft (9.8~15N·m, 1.0~1.5kg-m)

8. Install a new hub locknut and stake it, as shown.

Tightening torque : 154~205lb-ft (210~279N·m, 21.4~28.5kg-m)



9. Install hubcap, wheel and tire.
10. Install and tighten four wheel nuts.
11. Bleed brake system.

Tightening torque : 65~87lb-ft (88~118N·m, 9.0~12.0kg-m)

12. Lower vehicle.
13. After assembly, check rear wheel alignment.