

FRONT AXLE AND SUSPENSION

REFER TO 1988 CELICA REPAIR MANUAL (Pub.No. RM071U)

NOTE: The following pages contain only the points which differ from the above listed manual.

	Page
TROUBLESHOOTING	FA-2
FRONT WHEEL ALIGNMENT	FA-3
FRONT DRIVE SHAFT	FA-7
FRONT SUSPENSION	FA-18
Stabilizer Bar	FA-18

FA-2

FRONT AXLE AND SUSPENSION – Troubleshooting

TRUBLESHOOTING

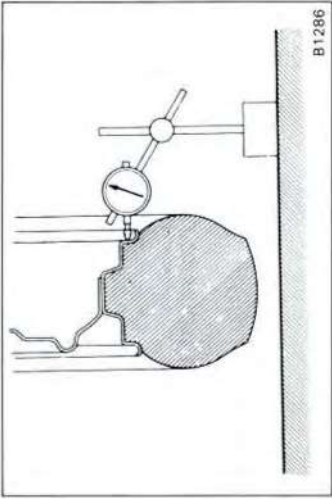
Problem	Possible cause	Remedy	Page
Wanders/pulls	Tires worn or improperly inflated	Replace tire or inflate tires to proper pressure	FA-3
	Alignment incorrect Front or rear suspension parts loose or broken	Check front wheel alignment Tighten or replace suspension parts	FA-3
Bottoming	Vehicle overloaded	Check loading	
Sways/pitches	Tires improperly inflated	Inflate tires to proper pressure	FA-3
	Stabilizer bar bent or broken	Inspect stabilizer bar	FA-18
Front wheel shimmy	Tires worn or improperly inflated	Replace tire or inflate tires to proper pressure	FA-3
	Wheels out of balance Alignment incorrect	Balance wheels Check front wheel alignment	FA-3
Abnormal tire wear	Tires improperly inflated	Inflate tires to proper pressure	FA-3
	Alignment incorrect	Check wheel alignment	FA-3

FRONT WHEEL ALIGNMENT

1. MAKE FOLLOWING CHECKS AND CORRECT ANY PROBLEMS

- (a) Check the tires for wear, size and proper inflation.

Cold Tire Inflation Pressure kg/cm ² (psi, kPa)		
Tire size	Front	Rear
205/60 VR 14	2.1 (30, 210)	2.1 (30, 210)
205/60 R14 87H		



- (b) Check the front wheel bearings for looseness.
- (c) Check the wheel runoff.

Lateral runoff: Less than 1.0 mm (0.039 in.)

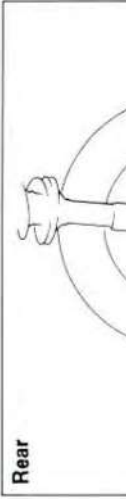
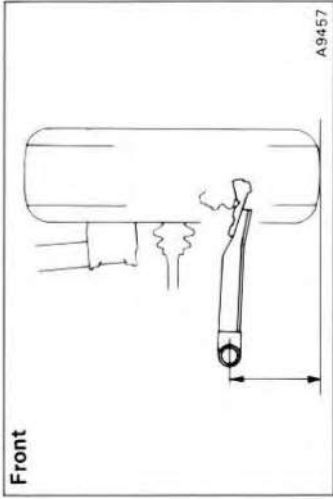
- (d) Check the front suspension for looseness.
- (e) Check the steering linkage for looseness.
- (f) Check that the front absorbers function properly by using the standard bounce test.

2. MEASURE CHASSIS GROUND CLEARANCE

Chassis Ground Clearance mm (in.)		
Tire size	Front	Rear
205/60 VR 14	192.6 (7.583)	233.7 (9.200)
205/60 R14 87H		

If the clearance of the vehicle is not standard, try to level by locking it down. If still not correct, check for bad springs or suspension parts.

NOTE: Before inspecting wheel alignment, adjust chassis ground clearance to specification.



FA-4

FRONT AXLE AND SUSPENSION — Front Wheel Alignment

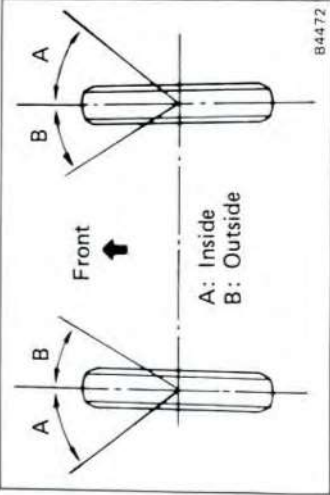


Diagram illustrating wheel alignment angles. A: Inside, B: Outside. Front arrow indicates direction. Reference number: B4472.

4. CHECK WHEEL ANGLE

Wheel angle:

Max.		at 20° (Outside wheel)
Inside wheel	34°	Inside wheel
	30°	21° 30'

If steering angles differ from the standard specifications, check to see if the lengths of the left and right tie rods are the same.

NOTE: If the tie rod lengths are not equal, the steering angle cannot be adjusted properly.

If the tie rod lengths were changed to adjust the steering angle, reinspect the toe-in.

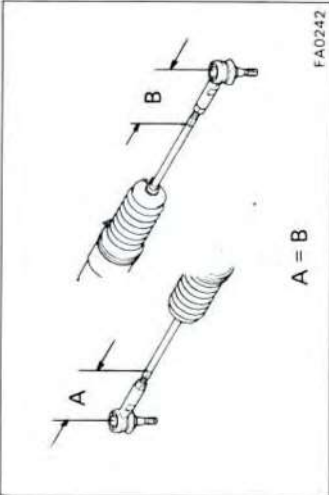


Diagram illustrating tie rod adjustment. A: Inside, B: Outside. Reference number: FA0242.

5. INSPECT CAMBER

Camber:

Inspection standard	-10' ± 45'
Adjustment standard	-10' ± 30'
Left-right error	30'

If camber is not within specification, adjust by turning the camber adjust cam.

(a) Loosen the shock absorber set nut.
(b) Turn the cam to adjust.

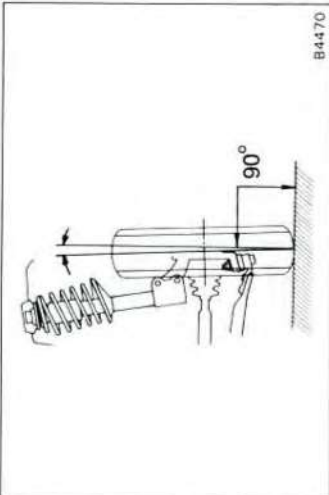


Diagram illustrating camber adjustment. Reference number: B4470.



More Camber

<https://cardiagn.com/front-axle-suspension-1988-celica/>

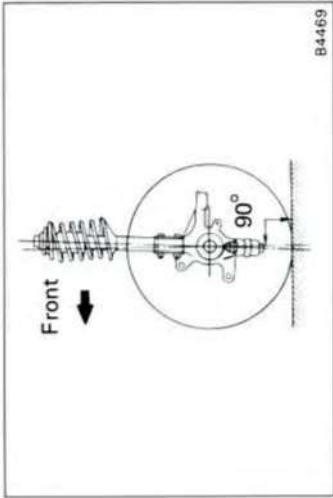
4/22

7. CHECK CASTER

Caster:

Inspection standard $1^{\circ}10' \pm 45'$
Left-right error 30'

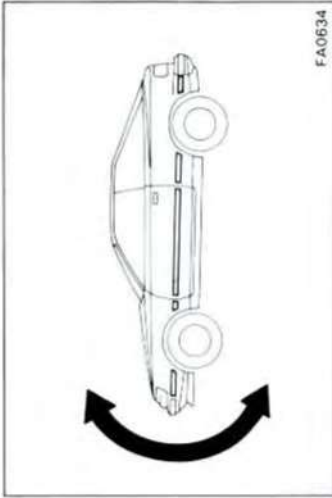
NOTE: Caster is not adjustable. If measurement is off standard, inspect suspension parts as necessary, then recheck the front wheel alignment.



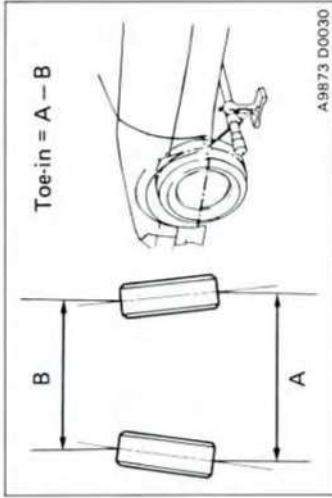
8. INSPECT TOE-IN

Adjust toe-in with a toe-in gauge in the following procedure.

- (a) Bounce the vehicle up and down to stabilize the suspension.
- (b) Move the vehicle forward about 5 m (16.4 ft) with the front wheel in the straight-ahead on a level place.



- (c) Mark the center of each rear tread and measure the distance between the marks of the right and left tires.



- (d) Advance the vehicle until the marks on the rear sides of the tires come to the measuring heights of the gauge on the front side.

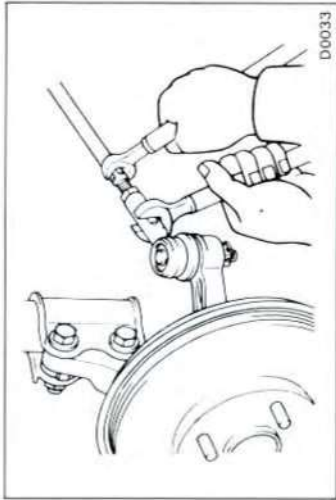
NOTE: If the tire rolls too far, repeat from step (b).

FA-6

FRONT AXLE AND SUSPENSION — Front Wheel Alignment



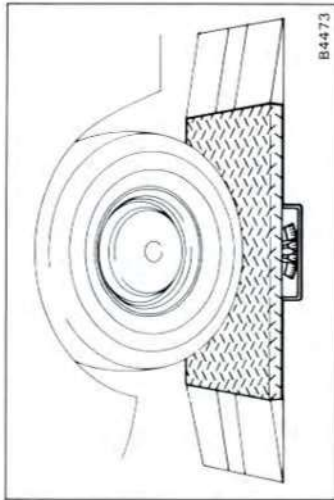
- (g) Remove the boot clip.
- (h) Loosen the lock nut.



- (i) Turn the left and right rack ends an equal amount to adjust.
- (j) Insure that the lengths of the left and right tie rods are the same.
- (k) Torque the tie rod lock nut.

Torque: 570 kg-cm (41 ft-lb, 56 N·m)

- (l) Place the boot on the seat and clamp it.
- NOTE:** Insure that the boot is not twisted.



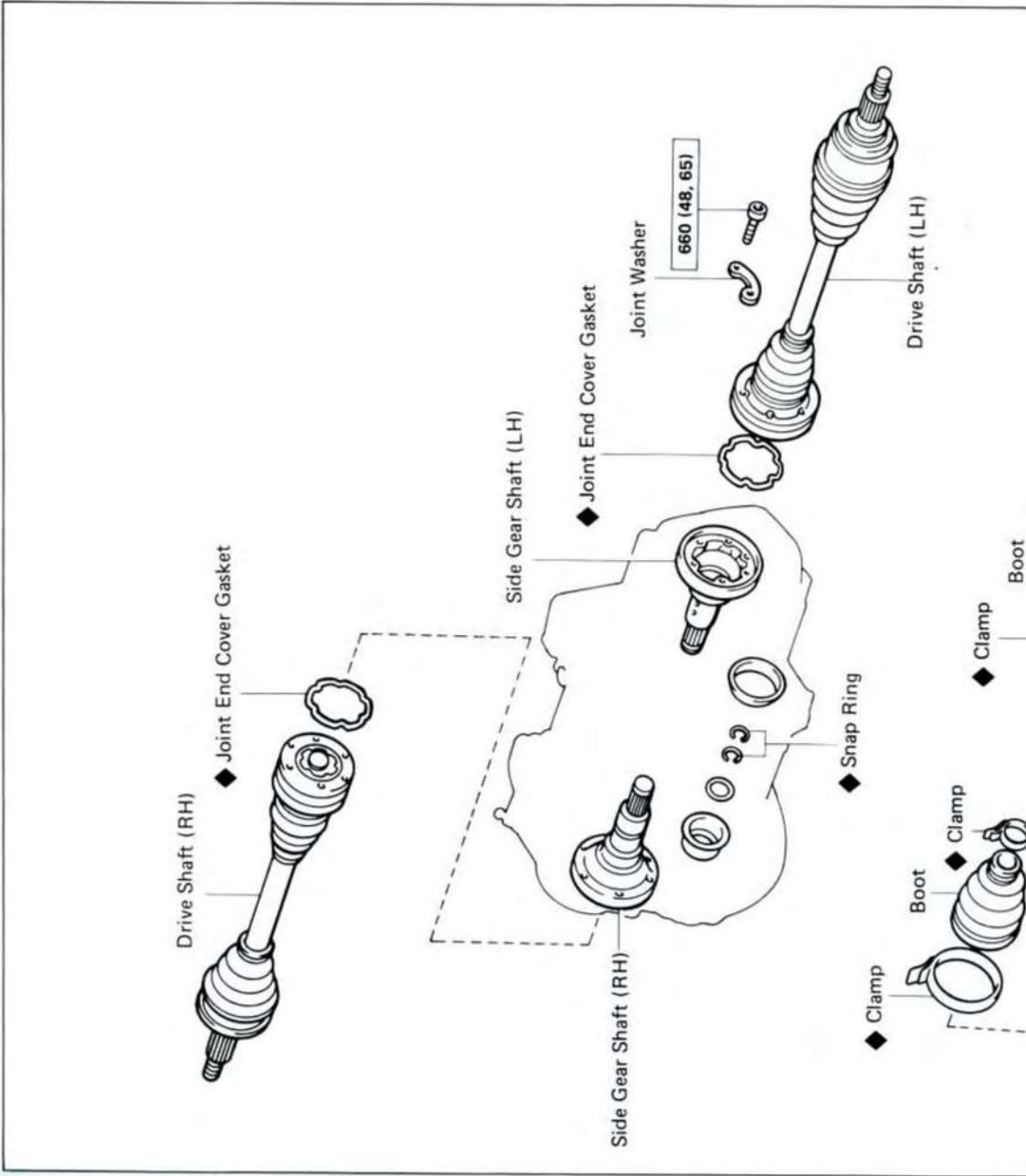
9. INSPECT SIDE SLIP WITH SIDE SLIP TESTER

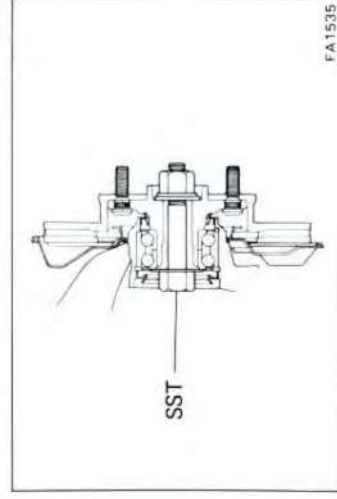
Side slip limit:

Less than 3.0 mm/m (0.118 in./3.3 ft)

If the side slip exceeds the limit, the toe-in or front wheel alignment may not be correct.

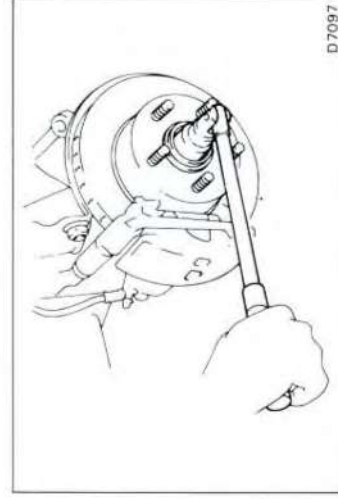
FRONT DRIVE SHAFT
COMPONENTS



FA-8**FRONT AXLE AND SUSPENSION — Front Drive Shaft**

CAUTION: The hub bearing could be damaged if it is subjected to the vehicle weight, such as when moving the vehicle with the drive shaft removed. Therefore, if it is absolutely necessary to place the vehicle weight on the hub bearing, first support it with SST.

SST 09608-16041 (09608-02020, 09608-02040)



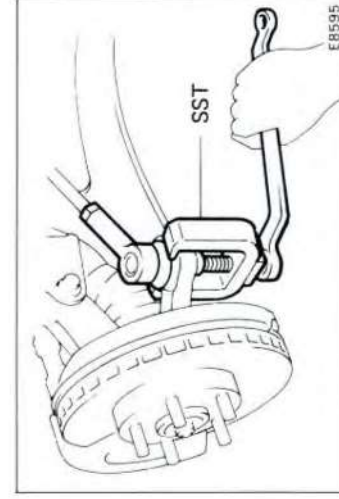
REMOVAL OF FRONT DRIVE SHAFT

(See page FA-7)

1. REMOVE COTTER PIN, LOCK NUT CAP AND LOCK NUT

- (a) Remove the cotter pin and lock nut cap.
- (b) Loosen the bearing lock nut while depressing the brake pedal.

2. REMOVE ENGINE UNDER COVER RH AND LH



3. DISCONNECT TIE ROD END

- (a) Remove the cotter pin and nut from the tie rod end.
- (b) Using SST, disconnect the tie rod end from the steering knuckle.

SST 09611-22012



4. DISCONNECT STEERING KNUCKLE FROM LOWER ARM

Remove the bolt and two nuts and disconnect the steering knuckle from the lower arm.

FRONT AXLE AND SUSPENSION — Front Drive Shaft

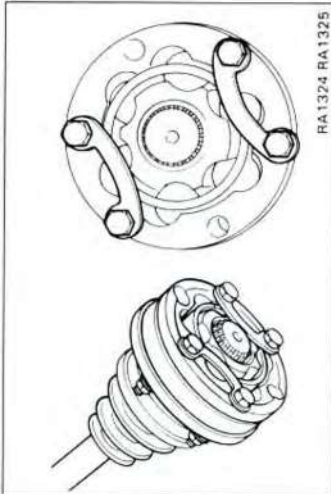
FA-9



(c) Push the front axle carrier towards the outside of the vehicle, and separate the drive shaft from the side gear shaft.

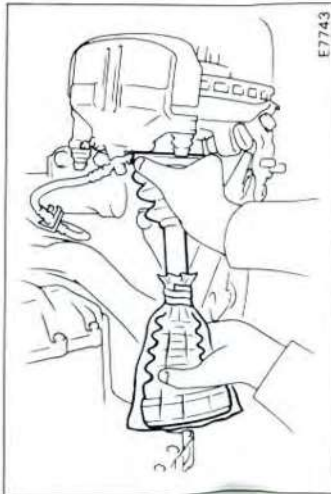
CAUTION: When moving the drive shaft, do not compress the inboard boot.

(d) Remove the joint end cover gasket from the drive shaft.



(e) Use bolts, nuts and washers to keep the inboard joint together.

CAUTION: Tighten the bolts by hand to avoid scratching the flange surface.



(f) Cover the inboard joint and side gear shaft, vinyl bag to keep out dust and sand.



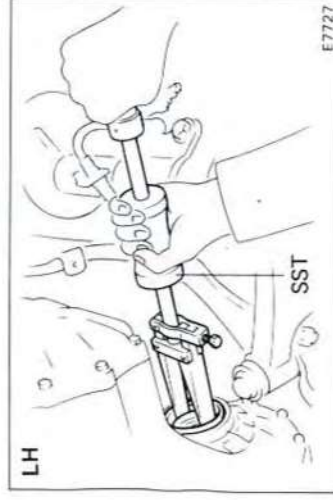
6. REMOVE FRONT DRIVE SHAFT
Using a plastic hammer, tap out the drive shaft from the axle hub.

FA-10

FRONT AXLE AND SUSPENSION — Front Drive Shaft

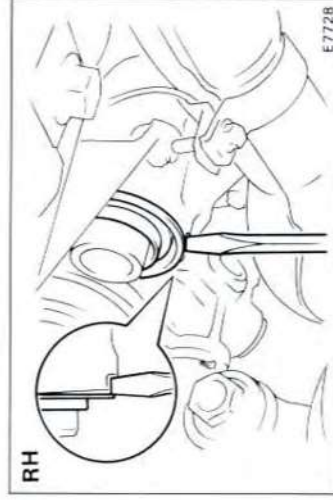
ON-VEHICLE REPLACEMENT OF SIDE GEAR SHAFT OIL SEAL

1. REMOVE SIDE GEAR SHAFT
(See step 8 on page FA-9)



2. REMOVE LH OIL SEAL

Using SST, drive out the oil seal from the case.
SST 09308-00010



3. REMOVE RH OIL SEAL

Using a screwdriver, remove the oil seal as shown.



4. INSTALL LH OIL SEAL

Using SST and hammer, tap in a new oil seal.
SST 09223-15010

NOTE: Coat the oil seal lip with MP grease.

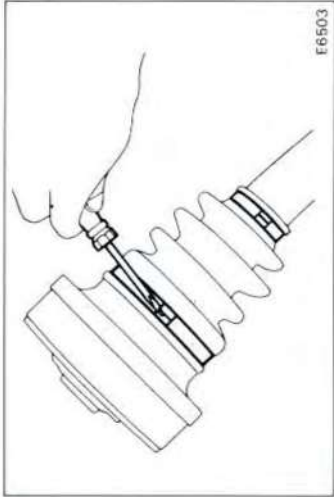
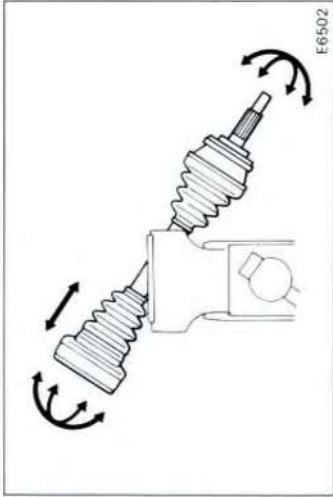
DISASSEMBLY OF FRONT DRIVE SHAFT

(See page FA-7)

1. CHECK DRIVE SHAFT

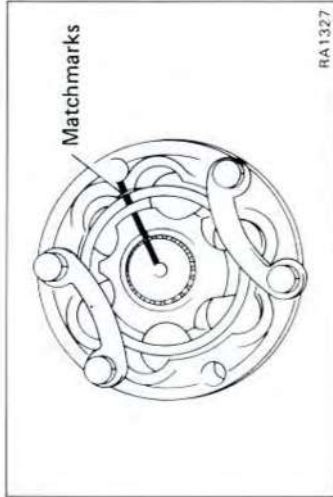
- (a) Check to see that there is no play in the inboard and outboard joints.
- (b) Check to see that the inboard joint slide smoothly in the thrust direction.
- (c) Check to see that there is no play in the radial direction of the inboard joint.
- (d) Check the damage of boot.

2. REMOVE INBOARD JOINT BOOT CLAMPS



3. DISASSEMBLE INBOARD JOINT

- (a) Place matchmarks on the inboard joint and drive shaft.
CAUTION: Do not use a punch to mark the matchmarks. Use paint, etc.

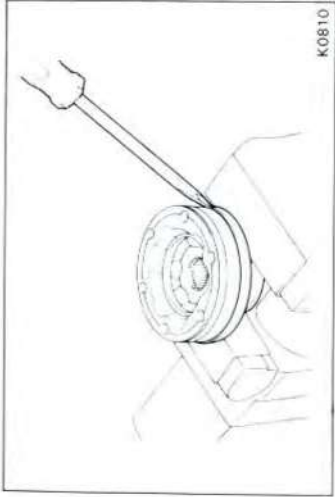


- (b) Using snap ring pliers, remove the snap ring.



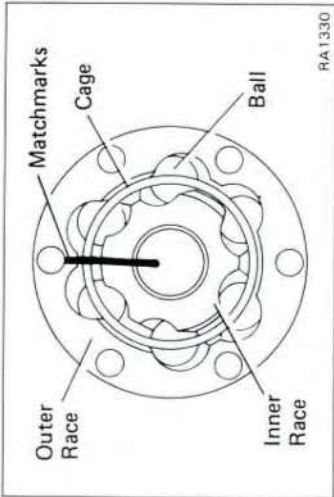
FA-12

FRONT AXLE AND SUSPENSION — Front Drive Shaft



- (e) Using a screwdriver and hammer, remove the inboard joint from inboard joint cover.

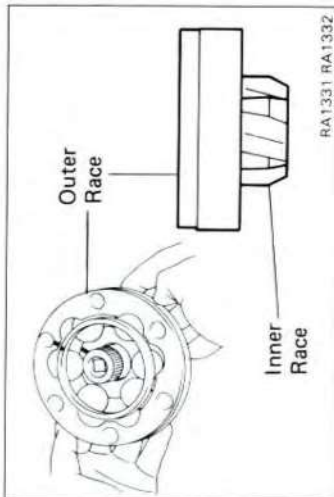
CAUTION: When lifting the inboard joint, hold onto the inner race and outer race.



NOTE: Should the joint become disassembled, reassemble it in the way shown in the illustration.

SERVICE HINT

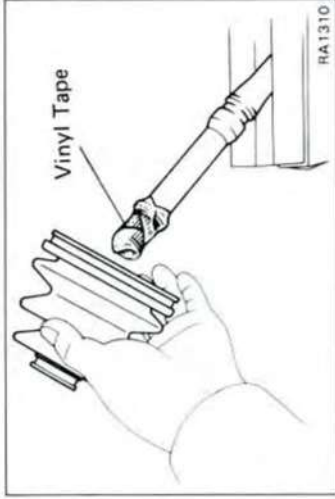
- (a) Align the matchmarks placed before disassembly.
(b) Insert the spark plug wrench into the inner race.
(c) Lift the outer race and cage, and insert the six balls.



- (d) Jiggle the outer race and cage as shown in the illustration to place the balls in their respective grooves.
(e) Lower the outer race and cage so that they fit tightly with the inner race.

ASSEMBLY OF FRONT DRIVE SHAFT

(See page FA-7)

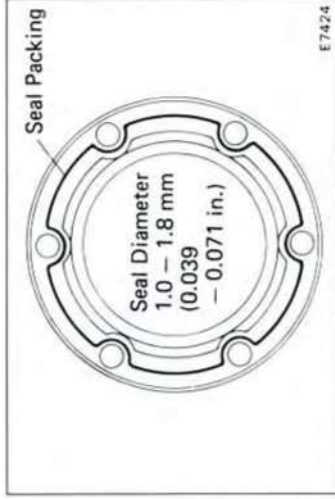


1. TEMPORARILY INSTALL BOOTS AND NEW BOOT CLAMPS

NOTE: Before installing the boot, wrap vinyl tape around the spline of the shaft to prevent damaging the boot. Temporarily install the boot and a new clamp to the outboard joint and inboard joint.

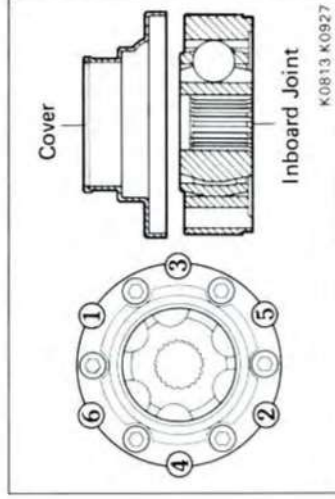
2. ASSEMBLE NEW INBOARD JOINT COVER

(a) Apply seal packing to the inboard joint cover as shown in the figure.



Seal packing: Part No. 08826-00801, THREE BOND 1121 or equivalent

NOTE: Avoid applying an excess amount to the surface.



(b) Align the bolt holes of the cover with those of the inboard joint, then insert the hexagon bolts.

(c) Using a plastic hammer to tap the rim of the inboard joint cover into place. Do this in the order shown, and repeat several times.

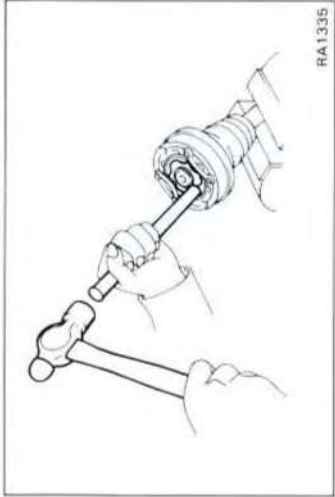


(d) Use bolts, nuts and washers to keep the inboard joint together.

CAUTION: Tighten the bolts by hand to avoid scratching the flange surface.

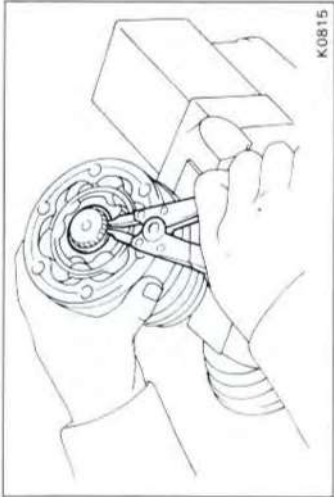
FA-14

FRONT AXLE AND SUSPENSION — Front Drive Shaft

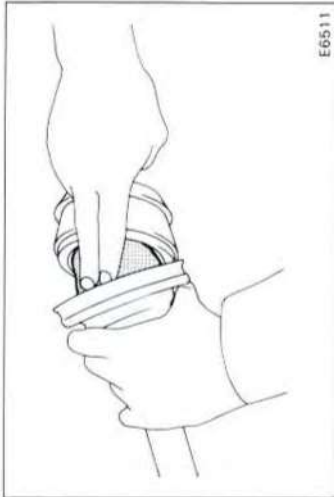


- (b) Using a brass bar and hammer, tap the inboard joint onto the drive shaft.

CAUTION: Make sure that the brass bar is touching the inner race, and not the cage.



- (c) Using snap ring pliers, install a new snap ring.



4. ASSEMBLE BOOT TO OUTBOARD JOINT

Before assembling the boots, pack in grease.
NOTE: Use the grease supplied in the boot kit.
Grease capacity: 120 g (0.26 lb)

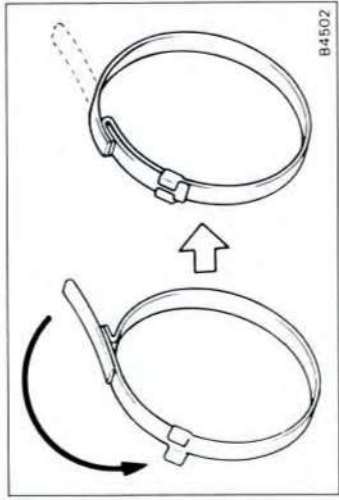


5. ASSEMBLE INBOARD JOINT TO INBOARD JOINT

Pack in grease to the inboard tulip and boot.
NOTE: Use the grease supplied in the boot kit.
Grease capacity: 120 g (0.26 lb)

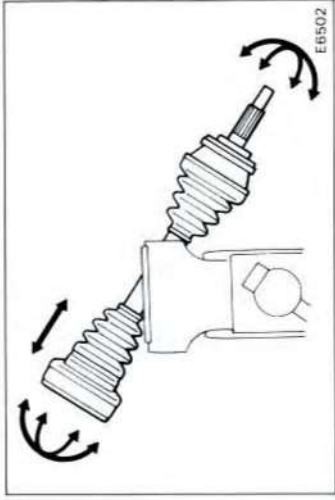
FRONT AXLE AND SUSPENSION — Front Drive Shaft FA-15

(c) Bend the band and lock it as shown in the figure.



7. CHECK DRIVE SHAFT

- (a) Check to see that there is no play in the inboard joint and outboard joint.
- (b) Check to see that the inboard joint slide smoothly in the thrust direction.



INSTALLATION OF FRONT DRIVE SHAFT

(See page FA-7)

- 1. INSTALL A NEW O-RING TO RH SIDE GEAR SHAFT

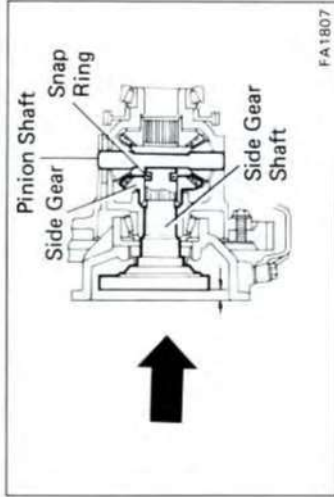


FA-16

FRONT AXLE AND SUSPENSION — Front Drive Shaft

3. CHECK INSTALLATION OF SIDE GEAR SHAFT

- (a) Check that the side gear shaft will not come out by trying to pull it completely out by hand.
- (b) Push the side gear shaft to the differential and measure the distance between the side gear shaft and the transaxle case. Check that the distance between the two is the same as the measurement taken before removing the side gear shaft.



FA1807

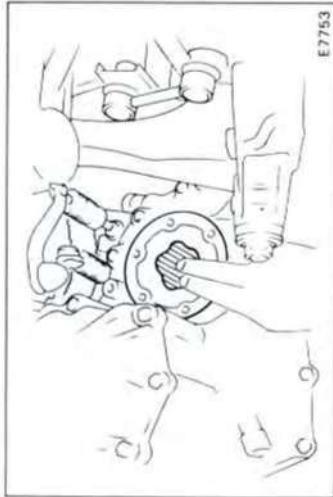
4. PACK IN GREASE TO SIDE GEAR SHAFT

Pack in grease to the side gear shaft.

Grease capacity: 43 g (0.09 lb)

NOTE: Use the grease supplied in the boot kit. Supply of grease only is also available.

Part No. 90999-94029

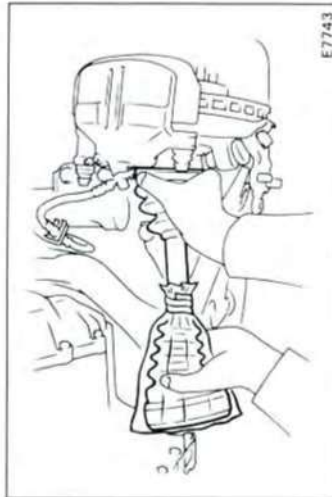


E7753

5. INSTALL FRONT DRIVE SHAFT TO AXLE HUB

- (a) Install the outboard joint side of the drive shaft to the axle hub.

CUTION: Be careful not to damage the boot, oil seal and deflector.



E7743

- (b) Push the rear axle carrier towards the outside vehicle and lift up the inboard joint.

CAUTION: When moving the drive shaft do not compress the boot.



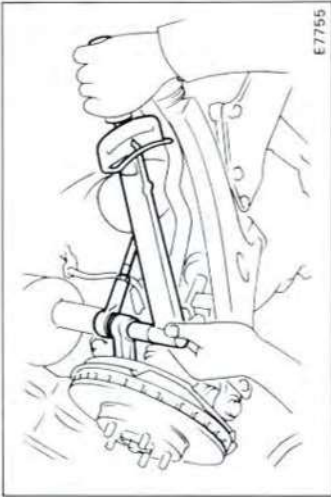
6. CONNECT TIE ROD END TO STEERING KNUCKLE

- (a) Install and torque the nut.

Torque: 500 kg-cm (36 ft-lb, 49 N·m)

- (b) Install a new cotter pin.

NOTE: If the cotter pin hole does not line up, correct by tightening the nut by the smallest amount possible.



7. CONNECT STEERING KNUCKLE TO LOWER ARM

Torque: 1,300 kg-cm (94 ft-lb, 127 N·m)



8. TIGHTEN INBOARD JOINT HOLDING SIX HEXAGON BOLTS

Using SST, torque the six hexagon bolts while depressing the brake pedal.

SST 09043-88010

Torque: 660 kg-cm (48 ft-lb, 65 N·m)



REFERENCE

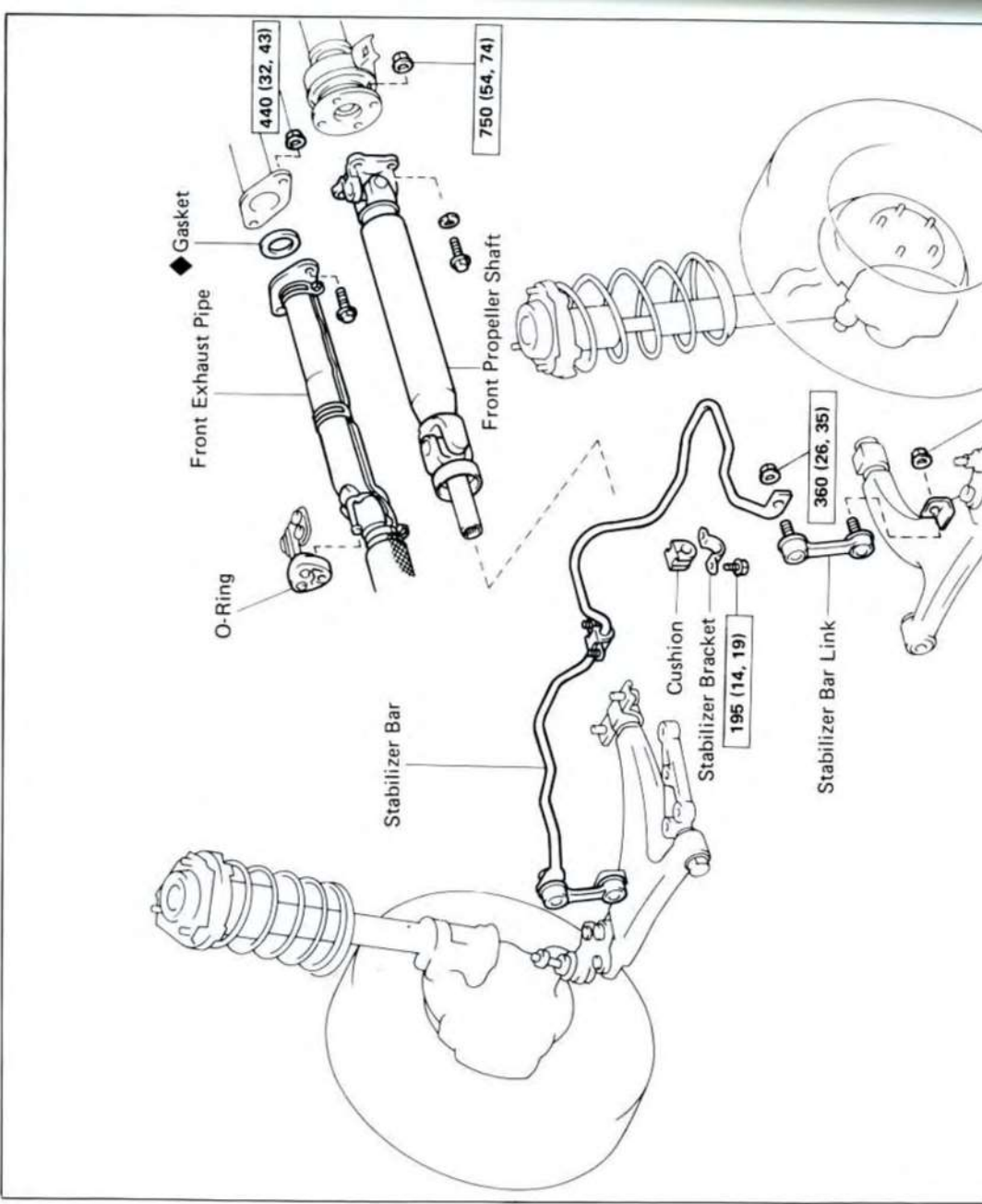
Measure the distance between RH and LH side gear shaft as shown the illustration.



FRONT SUSPENSION

Stabilizer Bar

COMPONENTS

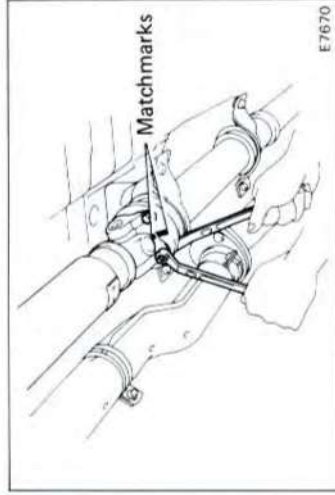


REMOVAL OF STABILIZER

(See page FA-18)

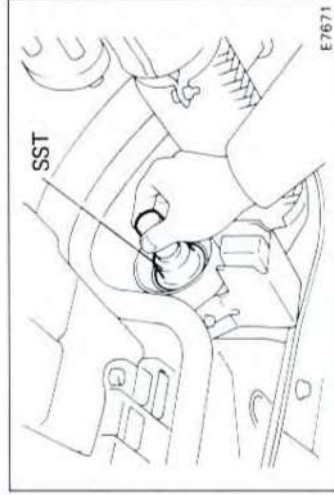
1. DISCONNECT FRONT PROPELLER SHAFT FROM INTERMEDIATE PROPELLER SHAFT

- (a) Place the matchmarks on the flanges.
- (b) Remove the four bolts and nuts.

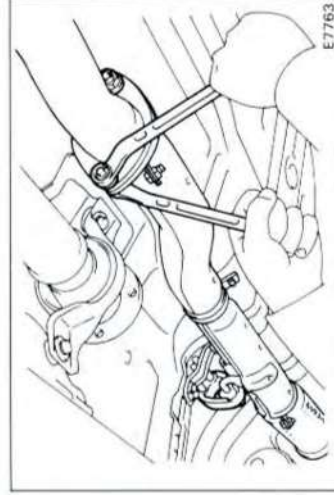
**2. REMOVE FRONT PROPELLER SHAFT FROM TRANSAXLE**

- (a) Pull the yoke from the transaxle.
- (b) Insert SST into the transaxle to prevent oil leakage.

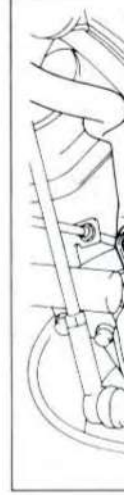
SST 09325-20010

**3. DISCONNECT FRONT EXHAUST PIPE FROM TAIL PIPE**

- (a) Disconnect front exhaust pipe from O-ring.
- (b) Disconnect front exhaust pipe from tail pipe.

**4. REMOVE STABILIZER BAR LINK**

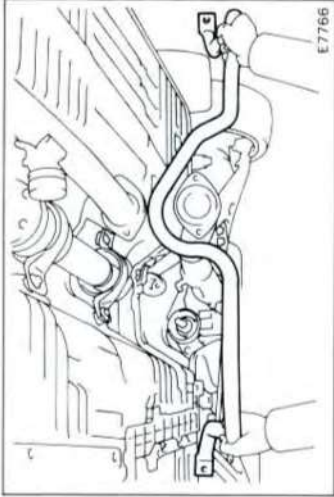
NOTE: If the ball joint stud turns together with the nut, use a hexagon wrench 5 mm (0.197 in.) to hold the stud.



FA-20

FRONT AXLE AND SUSPENSION – Front Suspension

6. REMOVE STABILIZER BAR

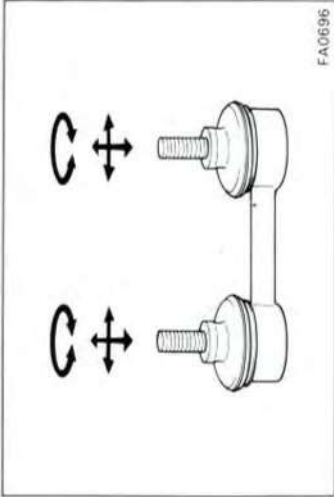


INSPECTION OF STABILIZER LINK

INSPECT STABILIZER LINK

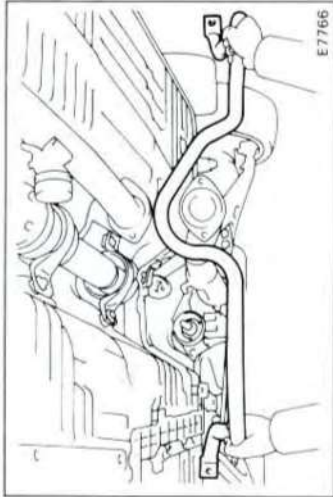
Rotate ball joint arm in all directions.

If the movement is not smooth and free, replace the stabilizer link.



INSTALLATION OF STABILIZER BAR

1. INSTALL STABILIZER BAR



2. INSTALL STABILIZER BRACKET AND CUSHION

Torque: 195 kg-cm (14 ft-lb, 19 N·m)



FRONT AXLE AND SUSPENSION — Front Suspension FA-21

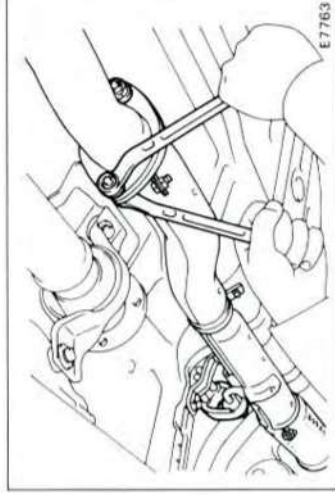
4. CONNECT FRONT EXHAUST PIPE TO TAIL PIPE

- (a) Connect front exhaust pipe to tail pipe.

Torque: 440 kg-cm (32 ft-lb, 43 N·m)

NOTE: Replace exhaust pipe gasket with new ones.

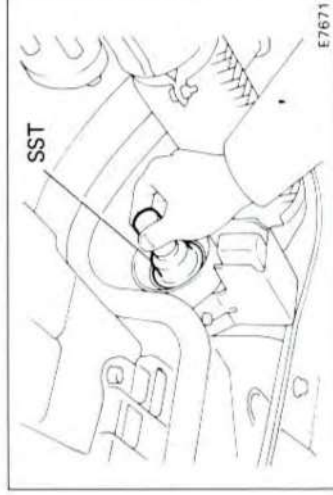
- (b) Connect front exhaust pipe to O-ring.



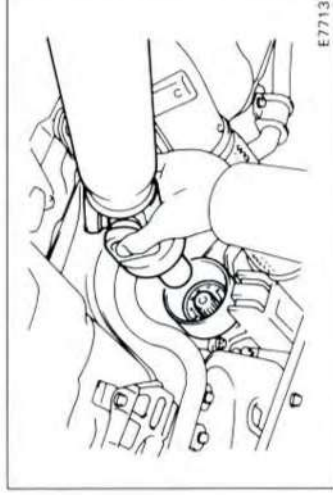
5. INSTALL FRONT PROPELLER SHAFT TO TRANSAXLE

- (a) Remove SST.

SST 09325-20010



- (b) Insert the yoke into the transaxle.

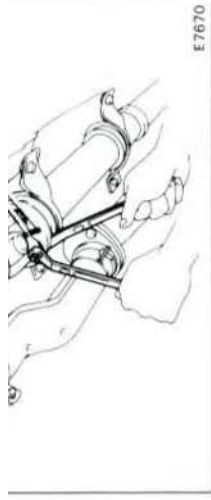


6. CONNECT FRONT PROPELLER SHAFT TO TRANSAXLE

- (a) Align the matchmarks on the flanges and connect the flanges with four bolts and nuts.

- (b) Torque the bolts and nuts.





Torque: 750 kg-cm (54 ft-lb, 74 N·m)

- 7. FILL TRANSAXLE WITH GEAR OIL**
(See step 4 on page MT-7)