FRONT SUSPENSION

CONTENTS

GENERAL SPECIFICATIONS

Suspension system	Independent double wishbone with torsion bar and telescopic shock absorber
Torsion bar	
Length x O.D. mm (in.)	1,277.5 x 24.5 (50.30 x .96)
Spring constant (wheel position) N/mm (lbs./in.)	22 (123)
Shock absorber	
Type	Hydraulic cylindrical double-acting type
Maximum length mm (in.)	335 (13.19)
Compressed length mm (in.)	215 (8.46)
Stroke mm (in.)	120 (4.72)
Damping force [at 0.3 m/sec. (0.984 ft./set.)]	
Expansion N (lbs.)	2,250 (495)
Contraction N (lbs.)	1,100 (242)
Wheel bearing	
Type	Tapered roller bearing
Dimensions (O.D. x I.D.) mm (in.)	
Outer	73.431 x 45.242 (2.891 x 1.781)
Inner	73.431 x 45.242 (2.891 x 1.781)
Drive shaft	
Joint type Outer	B.J.
Inner	D.O.J.
Length Right mm (in.)	528.5 (20.8)
(Joint to joint) Left mm (in.)	605.6 (23.8)
Inner shaft	
Shaft overall length mm (in.)	431 (17.0)
Bearing	
O.D. x I.D. mm (in.)	62 x 35 (2.44 x 1.38)
Differential	
Final ring gear type	Hypoid gear
Reduction ratio	
Manual transmission	4.625
Optional for Federal (not available in California)	4.875
Automatic transmission	4.222
Optional for Federal (not available in California)	4.625
Differential gear type	Straight bevel gear
Number of teeth	
Drive gear	
Manual transmission	37
Optional for Federal (not available in California)	39
Automatic transmission	38
Optional for Federal (not available in California)	37
Drive pinion	
Manual transmission	8
Automatic transmission	9
Optional for Federal (not available in California)	8
Side gear	14
Pinion gear	10

SERVICE SPECIFICATIONS

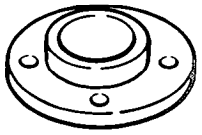
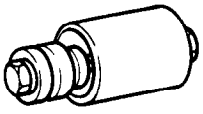
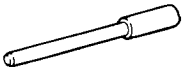
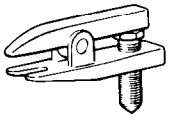
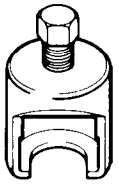
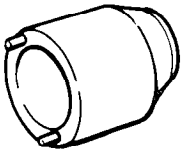
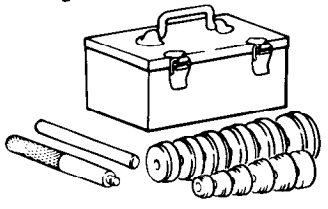
Standard Values	
Steering angle	
Inner wheel	$33^{\circ}{}^{+0^{\circ}}_{-3^{\circ}}$
Outer wheel	29°
Toe-in mm (in)	2-9 (.08-.35)
Camber	1° ± 30'
Caster	2°55' ± 30'
Kingpin inclination angle	8°
Upper arm shaft starting torque Nm (ft.lbs.)	15 (11)
Upper ball joint starting torque Ncm (in. lbs.)	80-350 (7.0-30)
Upper arm shaft reference dimension mm (in.)	72.5 (2.85)
Anchor arm reference dimension	
L.H. mm (in.)	138-146 (5.43-5.75)
R.H. mm (in.)	128-136 (5.04-5.35)
Stabilizer link assembly mounting bolt end reference dimension mm (in.)	16-18 (.69-.71)
Stabilizer mounting bolt end reference dimension mm (in.)	16-18 (.69-.71)
Shock absorber reference dimension mm (in.)	16.3 (.64)
Clearance between bump stopper and bump stopper bracket mm (in.)	71 (2.8)
Turning force of front hub assembly N (lbs.)	4-18 (0.9-4.1)
Setting of D.O.J. boot length mm (in.)	79 (3.1)
Drive shaft end play mm (in.)	0.2-0.5 (.08-.20)
Automatic free-wheeling hub	
Brake contact surface depth mm (in.)	11.8-12.2 (.46-.48)
Final ring gear backlash mm (in.)	0.13-0.18 (.005-.007)
Drive pinion preload	
With oil seal Ncm (in. lbs.)	100-130 (8.7-11.3)
Without oil seal Ncm (in. lbs.)	7-100 (6.1-8.7)
Repair limits	
Front axle total backlash mm (in.)	14 (.6)
Differential gear backlash mm (in.)	0.15 (.006)
Ring gear runout mm (in.)	0.05 (.002)
Automatic free wheeling hub	
Brake wear mm (in.)	9.6 (.38)
Return spring deterioration mm (in.)	35 (1.4)
Shift spring deterioration mm (in.)	30 (1.2)
Service limits	
Lower ball joint end play mm (in.)	0.5 (.02)
Drive shaft or inner shaft spline play mm (in.)	0.5 (.02)

TORQUE SPECIFICATIONS

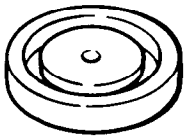
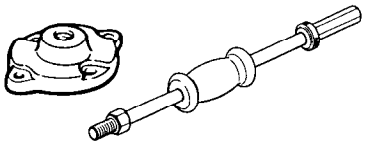
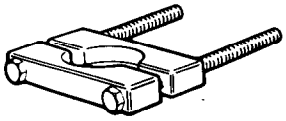
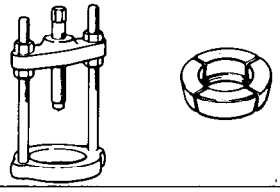
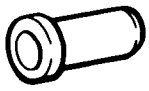
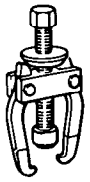
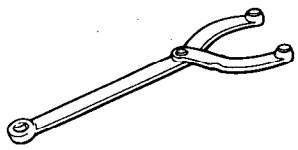
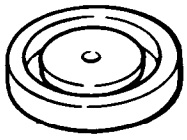
	Nm (ft.lbs.)
Stabilizer bar bracket	8-12 (6-9)
Upper arm shaft to crossmember	100-120 (72-87)
Rebound stopper to upper arm	8-12 (6-9)
Upper ball joint to knuckle	60-90 (43-65)
Lower ball joint to knuckle	120-180 (87-130)
Front shock absorber to crossmember	12-18 (9-13)
Front shock absorber to lower arm	15-22 (11-16)
Lower arm shaft	140-160 (101-116)
Lower arm ball joint to lower arm	54-75 (39-54)
Bump stopper to lower arm	20-30 (14-22)
Anchor arm B	95-120 (69-87)
Anchor arm lock nut	40-50 (29-36)
Front hub to brake disc	50-60 (36-43)
Free wheeling hub body	50-60 (36-43)
Automatic free-wheeling hub cover	18-22 (13-16)
Manual free-wheeling hub cover	10-14 (7-10)
Right drive shaft to inner shaft	50-60 (36-43)
Differential mounting brackets to frame	80-100 (58-72)
Right differential mounting bracket to housing tube	80-100 (58-72)
Housing tube to differential carrier	80-100 (58-72)
Differential mounting bracket to differential carrier	80-100 (58-72)
Bracket to front suspension crossmember	30-42 (22-30)
Bracket to differential carrier	80-100 (58-72)
Filler plug	40-60 (29-43)
Cover	15-22 (11-16)
Vent plug	16-20 (12-14)
Differential case to ring gear	80-90 (58-65)
Bearing cap	55-65 (40-47)
Drain plug	60-70 (43-51)
Companion flange	160-220 (116-159)

LUBRICANTS

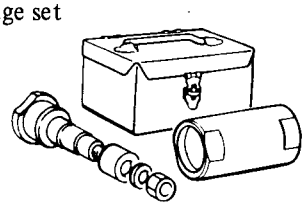
	Specified lubricant	Quantity
B.J. boot grease	Repair kit grease	100-150gr (3.5-5.3 oz.)
D.O.J. boot grease	Repair kit grease	100-150gr (3.5-5.3 oz.)
Conventional differential	Hypoid gear oil API classification GL-4 or GL-5 SAE viscosity No. 90	1.10 lit. (1.16 U.S. qt., 0.97 Imp. qt.)
Front hub bearing	Multipurpose grease SAE J310a, NLGI grade #2EP	As required
Automatic free-wheeling hub	Multipurpose grease SAE J310a, NLGI grade #2EP	As required
Upper and lower ball joints	Multipurpose grease SAE J310a, NLGI grade #2EP	As required

Tool (Number and name)	Use	Tool (Number and name)	Use
MB991034 Gauge attachment 	Measurement of wheel alignment	MB990799 Ball joint remover and installer A  MB990800 Ball joint remover and installer B 	Removal and installation of upper arm ball joint
MB990958 Torsion bar bushing remover and installer 	Removal and pressing of bushing A	MB990883 Arbor 	Removal and pressing of the bushing B
MB990635 "*" Steering linkage puller 	Removal of knuckle Disconnection of tie rod Disconnection of upper ball joint	MB990809 "*" Pitman arm puller 	Removal of knuckle Disconnection of lower ball joint
MB990954 Lock nut wrench 	Removal and adjustment of lock nut	MB990925 Bearing and oil seal installer set 	Pressing of front axle hub bearing outer race Removal and pressing of drive pinion bearing outer race
MD998360 "D" Cylinder head bolt wrench 	Removal, installation and retightening of automatic free-wheeling hub	MB990811 Differential side bearing cup 	Removal of side bearing inner race Disassembly and reassembly of automatic free-wheeling hub

"*", "D" see page 2 for instructions.

Tool (Number and name)	Use	Tool (Number and name)	Use
MB990956 Needle bearing installer 	Pressing of needle bearing	MB990985 Oil seal installer 	Pressing of knuckle oil seal
MB990906 "*" Drive shaft attachment MB990211 Sliding hammer 	Removal and insertion of inner shaft assembly	MB990560 (A800ST15) "*" Bearing remover 	Removal and pressing of inner shaft bearing
MB990339 "*" (WT-00104) Bearing puller MB990648 "*" Bearing remover 	Removal of drive pinion front bearing inner race	MB990802 Bearing installer 	Pressing of drive pinion front bearing inner race Pressing of side bearing inner race
MB990031 Drive pinion oil seal installer 	Pressing of drive pinion oil seal	MB990810 "*" Side bearing puller 	Removal of side bearing inner race
MB990767 "D" End yoke holder 	Removal of companion flange	MB990955 Oil seal installer 	Pressing of front axle hub oil seal

"*", "D" see page 2 for instructions.

Tool (Number and name)	Use
MB990901 "*" Pinion height measurement gauge set 	Measurement of drive pinion height

"*" see page 2 for instructions.

TROUBLESHOOTING

Symptom	Probable cause	Remedy
Steering wheel is heavy, vibrates or pulls to one side	Suspension malfunction: Ball joint Torsion bar Wheel alignment	Inspect, adjust or replace appropriate parts (Refer to GROUP 19.)
Excessive vehicle rolling	Broken or deteriorated stabilizer Shock absorber malfunctioning	Replace
Poor riding	Excessive tire inflation pressure	Adjust the tire inflation pressure (Refer to GROUP 22.)
	Shock absorber malfunctioning Deteriorated bump stopper or rebound stopper Worn or deformed torsion bar support	Replace
	Deformed torsion bar	Replace
	Broken or deteriorated torsion bar	Replace
Noise	Loose or deformed anchor bolt	Retighten or replace
	Worn torsion bar serration Oil leakage from shock absorber	Replace
	Inadequate lubrication of various sections	Lubricate
	Worn or deformed bushing Shock absorber malfunctioning	Replace
Vehicle leans to one side	Anchor arm assembly not installed in correct position Inadequately tightened anchor bolt	Retighten or replace
	Deformed crossmember Broken or deteriorated torsion bar	Replace

Symptom	Probable cause	Remedy
MANUAL FREE-WHEELING HUB, FRONT AXLE HUB, KNUCKLE Noise due to excessive play of wheel in the direction of rotation	Play in free-wheeling hub serration	Adjust or replace
Noise due to excessive wheel end play	Wheel bearing play, seizure, wear	Check, and adjust or replace if necessary
	Knuckle needle bearing play, seizure, wear	Replace
	Free-wheeling hub serration play	Adjust or replace
	Free-wheeling hub looseness	Tighten or replace
Steering wheel shimmy	Wheel bearing wear, play, seizure	Check, and adjust or replace if necessary
	Free-wheeling hub serration play	Adjust or replace
Car pulls to one side	Wheel bearing wear, play, seizure	Check, and adjust or replace if necessary
	Free-wheeling hub serration play	Adjust or replace
AUTOMATIC FREE-WHEELING HUB Does not lock	Brake sliding portion worn Brake B lug broken Housing damaged	Replace parts and adjust shims on hub mounting surface shims
	Drive gear damaged Slide gear damaged Retainer A damaged Cam damaged Shift spring deteriorated Slide gear C-ring out of position	Replace parts
	Automatic free-wheeling hub mounting bolts loose	Retighten mounting bolts
Locks but does not become free	Return spring deteriorated Slide gear snap ring out of position	Replace parts
	Foreign substance on tooth surfaces of drive gear and slide gear Foreign substance on tooth surfaces of slide gear and housing gear	Clean tooth surfaces or replace parts
	Excessive front power train resistance	Adjust differential preload

Symptom	Probable cause	Remedy
Ratcheting occurs easily	Water in brake	Clean and apply grease
	Retainer B worn Slide gear damaged Housing gear damaged Shift spring deteriorated Slide gear C-ring out of position	Replace parts
	Automatic free-wheeling hub mounting bolts loose	Retighten the mounting bolts
DRIVE SHAFT, INNER SHAFT Noise during tire rotation	Housing tube bent Inner shaft bent Inner shaft bearing worn, pounding	Replace
	Drive shaft assembly worn, damaged, bent	Check or replace
Noise due to excessive play of wheel in turning direction	Inner shaft and side gear serration play Drive shaft and side gear serration play Drive shaft and drive flange play	Adjust or replace
Noise due to excessive wheel end play	Drive shaft and drive flange end play	Adjust or replace
	Drive flange looseness	Tighten or replace
Steering wheel shimmy	Drive shaft assembly bent, damaged, worn	Replace
	Drive shaft assembly and drive flange play	Adjust or replace
Car pulls to one side	Drive shaft assembly and drive flange play	Adjust or replace
DIFFERENTIAL Constant noise	Improper adjustment of ring gear and drive pinion (poor meshing) Loose, worn or damaged side bearing Loose, worn or damaged drive pinion bearing	Correct or replace
	Worn ring gear or drive pinion Worn side gear thrust washer or pinion shaft Deformed ring gear or differential case Damaged gear	Replace
	Foreign material	Eliminate the foreign material and check; replace the parts if necessary
	Insufficient oil	Replenish

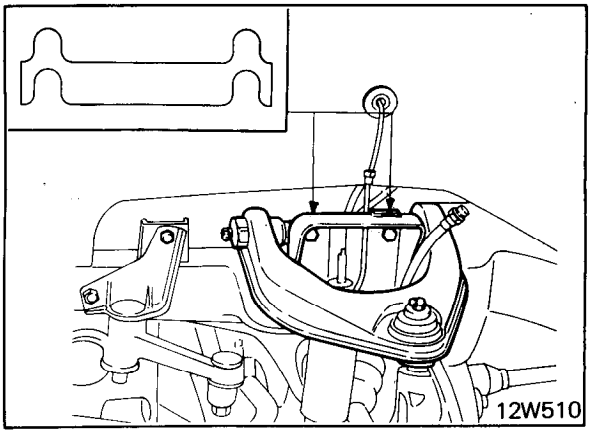
Symptom	Probable cause	Remedy
Gear noise while driving	Poor gear engagement Improper gear adjustment Improper drive pinion preload adjustment	Correct or replace
	Damaged gear	Replace
	Foreign material	Eliminate the foreign material and check; replace the parts if necessary
	Insufficient oil	Replenish
Gear noise while coasting	Improper drive pinion preload adjustment	Correct or replace
	Damaged gear	Replace
Bearing noise while driving or coasting	Cracked or damaged drive pinion rear bearing	Replace
Noise while turning	Loose side bearing Damaged side gear, pinion gear or pinion shaft	Replace
Heat	Insufficient gear backlash Excessive preload	Adjust
	Insufficient oil	Replenish
Oil leakage	Clogged vent plug	Clean or replace the parts
	Loose cover Poor sealing	Retighten, apply sealant, or replace the gasket
	Worn or damaged oil seal	Replace
	Excessive oil	Adjust the oil level

INSPECTION AND ADJUSTMENT OF THE WHEEL ALIGNMENT

Camber

1. Remove the free-wheeling hub and mount the special tool onto the front hub.
2. Measure the camber with a camber/caster/kingpin gauge.
3. Make adjustment of the camber by increasing or decreasing the thickness of the adjusting shims between the upper arm shaft and the crossmember. (12W510)

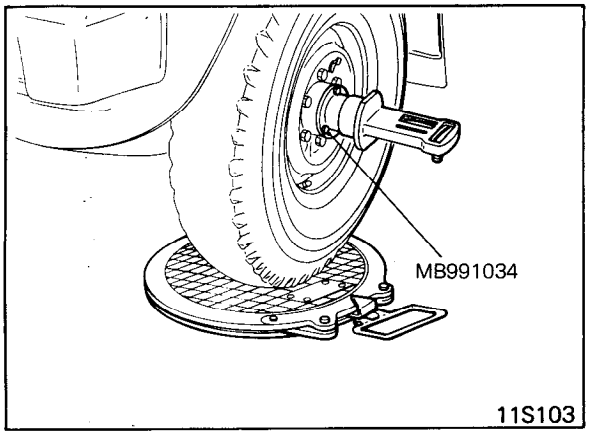
Camber	1° ± 30'



Caster

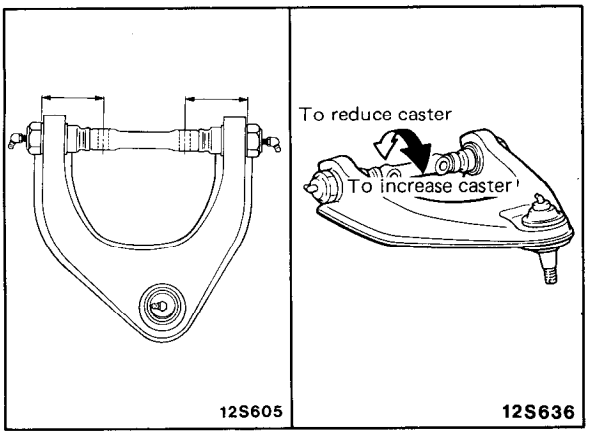
1. Remove the free-wheeling hub and mount the special tool onto the front hub.
2. Measure caster with a camber/caster/kingpin gauge and a turning radius gauge. (11S103)

Caster	2°55' ± 30'



3. If caster does not meet specifications, remove the upper arm from the crossmember and then adjust by turning the upper arm shaft.

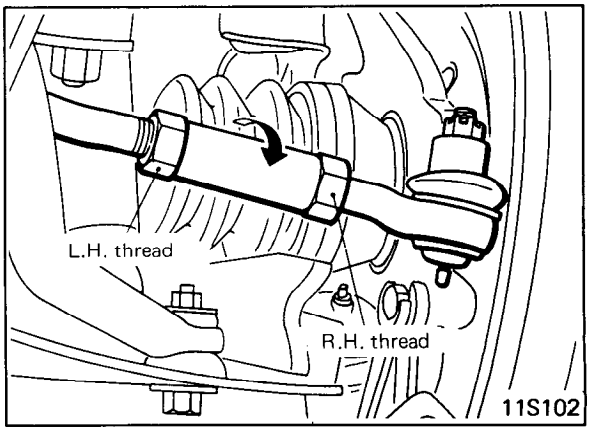
Upper arm shaft reference dimension	72.5 mm (2.85 in.)



Toe-in

1. If the toe-in does not agree with the standard value, use the left and right tie rod turnbuckles to adjust it. (11S102)
2. Make the adjustment by turning the left and right turnbuckles the same amount in opposite directions. The toe-in value will decrease if the left turnbuckle is turned toward the front of vehicle and the right one is turned toward the rear, and vice A half-turn of the turnbuckles will result in an approximately 7.5 mm (.29 in.) adjustment in the toe-in.

Toe-in	2-9 mm (.08-.35 in.)



FRONT AXLE TOTAL BACKLASH

If the vehicle vibrates and produces a booming sound due to the unbalance of the drivetrain, measure the front axle total backlash as follows to see if the differential carrier assembly requires removal.

(1) For vehicles equipped with free-wheeling hubs, set the hubs for 4-wheel drive.

NOTE
For vehicles with manual free-wheeling hubs, set the control handle to the "LOCK" position.
For vehicles with automatic free-wheeling hubs, set the transfer shift lever to "4H" and drive 1 to 2 m to engage the hubs with the drive shafts.

(2) Secure the wheels and set the transfer control lever to "2H".

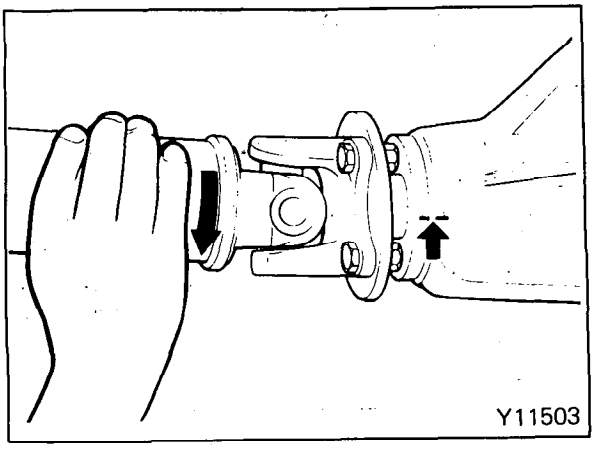
NOTE
If the vehicle is raised on a jack, the wheels will turn and it will not be possible to measure the backlash.

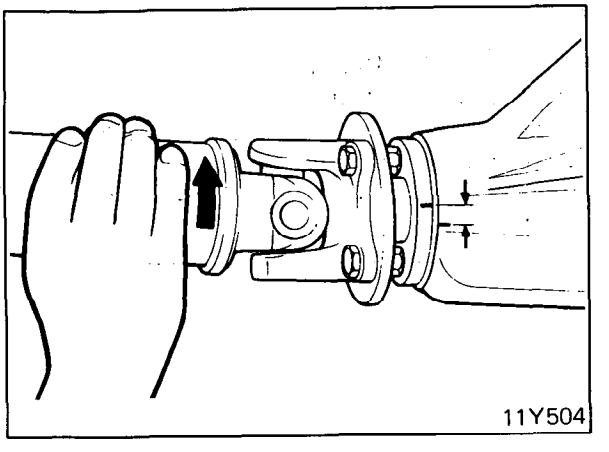
(3) Turn the companion flange clockwise until all play is removed. Make mating marks on the dust cover of the companion flange and on the differential carrier. (Y11503)

(4) Turn the companion flange counterclockwise until all play is removed and measure the amount of distance through which the mating marks moved. (11Y504)

(5) If the backlash exceeds the repair limit, remove the differential carrier assembly and adjust the backlash and drive shaft or inner shaft spline play.

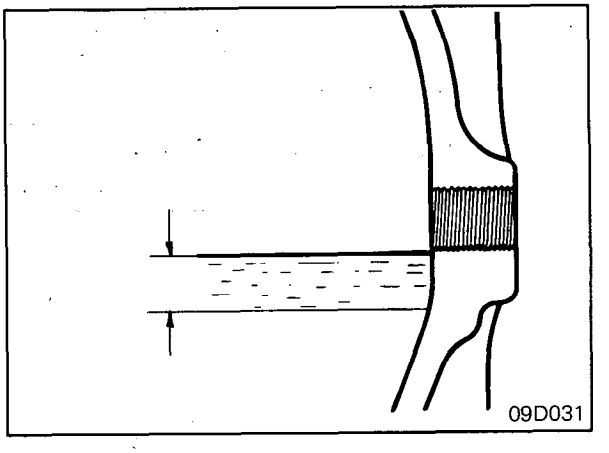
Front axle total backlash [Repair limit]	14 mm (.6 in.)





CHECKING GEAR OIL LEVEL

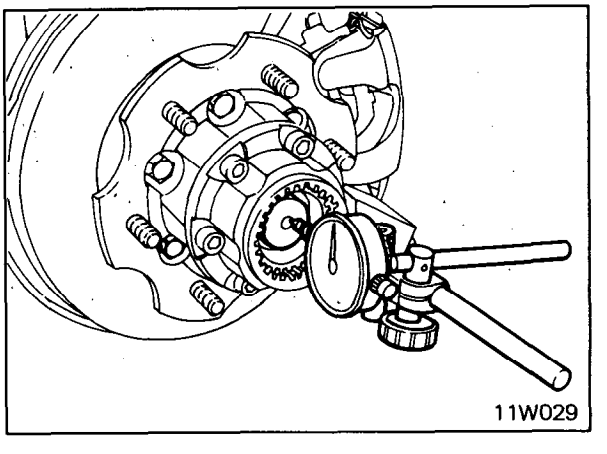
Remove the filler plug and check the oil level. The oil level should be somewhere within 8 mm (.31 in.) from the bottom of the filler plug hole.



INSPECTION OF DRIVE SHAFT END PLAY

Measure drive shaft end play with a dial indicator.

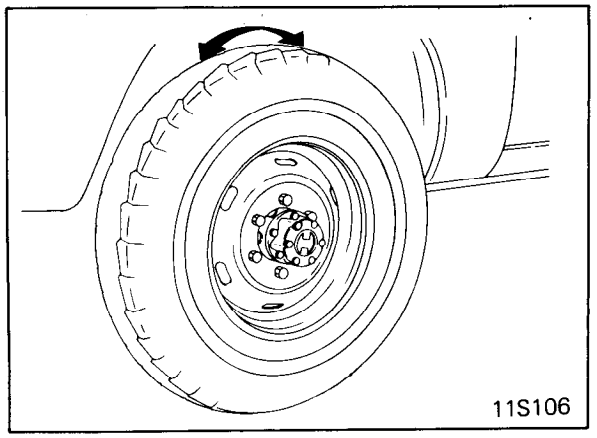
Drive shaft end play	0.2-0.5 mm (.008-.020 in.)



WHEEL BEARING PLAY INSPECTION

1. Inspect the play of the bearings while the vehicle is jacked up. (11S106)
2. If there is play, adjust by tightening the lock nuts. (Refer to p. 2-29.)

Caution
Do not confuse the end play of the bearings with the play of ball joint.

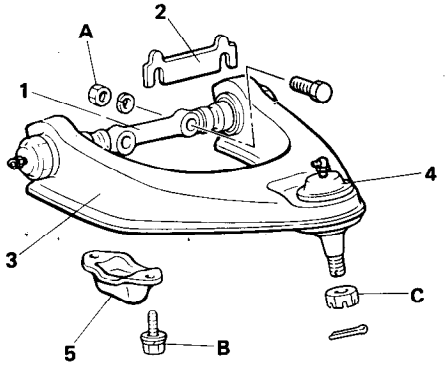


UPPER ARM

COMPONENTS

1. Upper arm shaft
2. Adjusting shim
3. Upper arm
4. Upper ball joint
5. Rebound stopper

	Nm	ft. lbs.
A	100-120	72-87
B	8-12	6-9
C	60-90	43-65

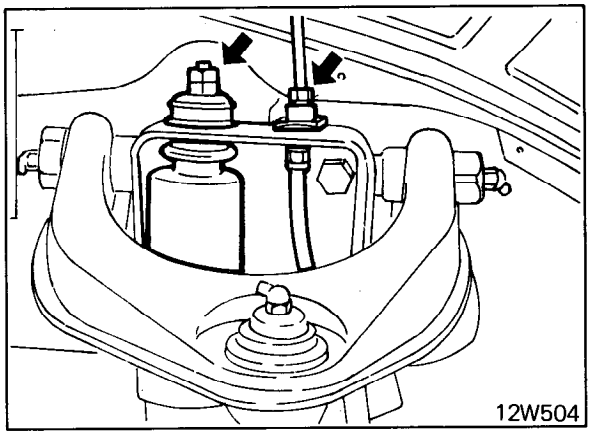


11W517

REMOVAL

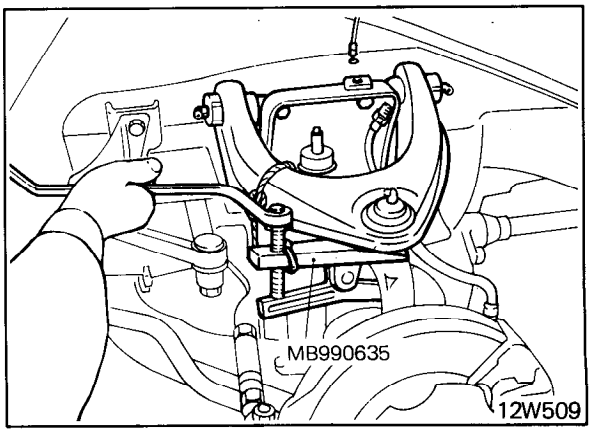
1. Loosen the anchor bolt of the torsion bar all the way. (Refer to p. 2-20.)
2. Remove the lower part of the shock absorber. (Refer to p. 2-24.) (12W504)
3. Discharge brake fluid and disconnect the brake hose. (Refer to GROUP 5.) (12W504)
4. Loosen the nut holding the upper ball joint to the knuckle.

NOTE
The nut should only be partially loosened and should not be removed.



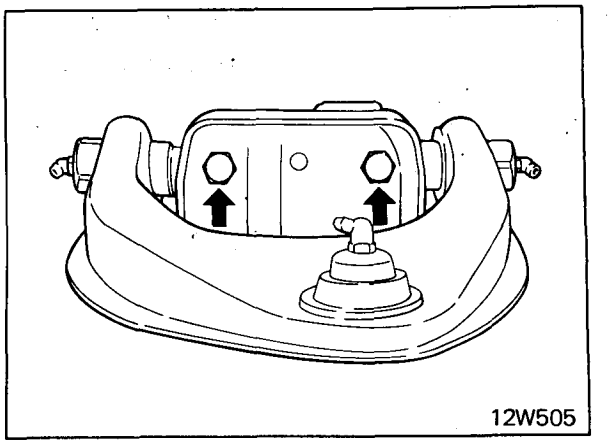
5. Using the special tool, disconnect the upper ball joint from the knuckle. (12W509)

Caution
Tie the special tool to the upper arm with rope to prevent bouncing.



6. Remove the upper arm from the crossmember.

NOTE
The camber adjustment shims should be marked for reference during assembly.
Do not turn the upper arm shaft, since it changes the caster.

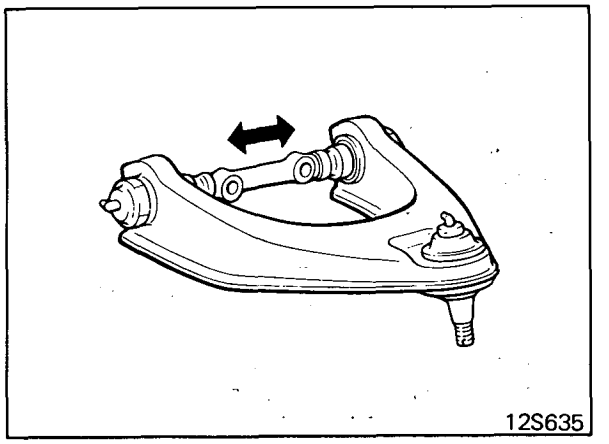

12W505

INSPECTION

1. Check upper arm for deformation or cracks.
2. Check upper arm shaft for bends or cracks.

Inspection for Play of the Upper Arm Shaft

1. With the upper arm assembly held in a vice, move the upper arm shaft to check for play.
2. If the upper arm shaft has play, replace the upper arm assembly. (12S635)

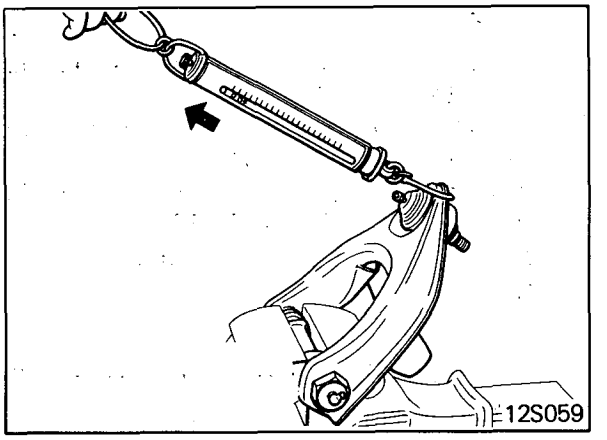

12S635

Measurement of the Upper Arm Shaft Starting Torque

1. With the upper arm shaft held in a vice, measure the upper arm shaft starting torque with a spring scale. (12S059)

Upper arm shaft starting torque	15 Nm (11 ft.lbs.)

2. If the upper arm shaft starting torque exceeds the standard value, replace the upper arm assembly.

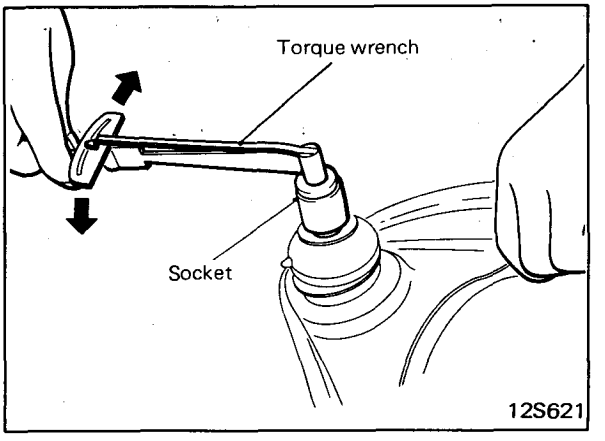

12S059

Measurement of the Upper Ball Joint Starting Torque

1. Measure the upper ball joint starting torque with a torque wrench. (12S621)

Upper ball joint starting torque	80-350 Ncm (7.0-30 in. lbs.)

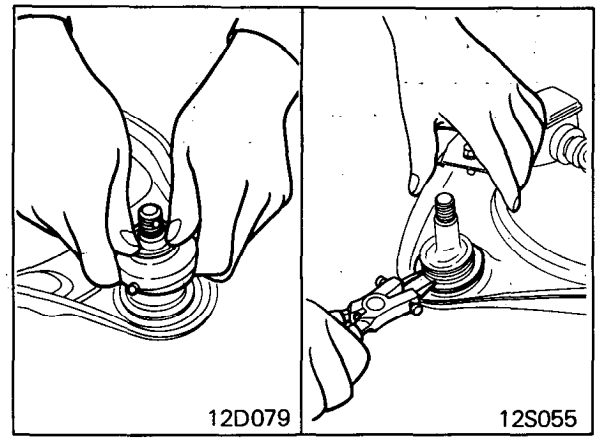
2. If the upper ball joint starting torque is out of specification, replace the upper ball joint.



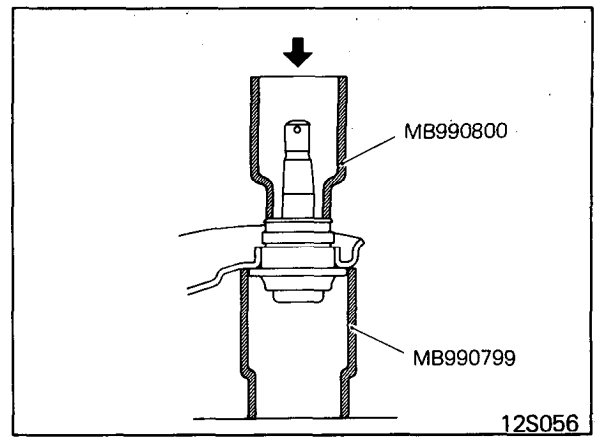
12S621

UPPER BALL JOINT REPLACEMENT

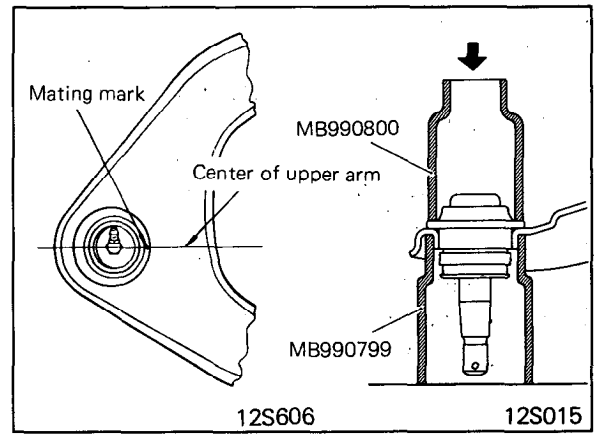
1. Remove the dust cover together with the ring. (12D079)
2. Remove the snap ring from the upper ball joint. (12S055)



3. Press the upper ball joint out of the upper arm with the special tools.

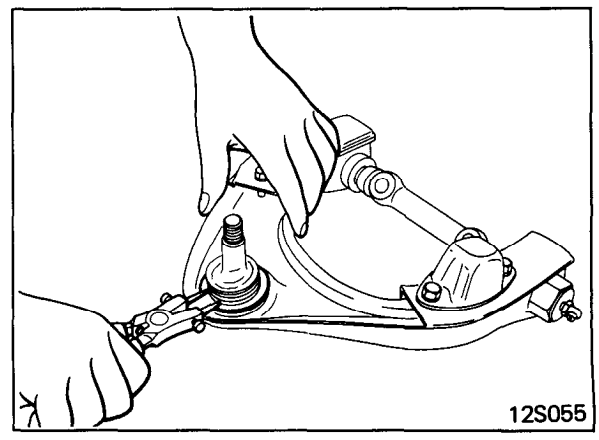


4. Use the special tools illustrated to press the new ball joint into the upper arm. Be sure to align the mating mark with the upper arm center.



5. Using snap ring pliers, fit the snap ring securely into the groove of the joint case.

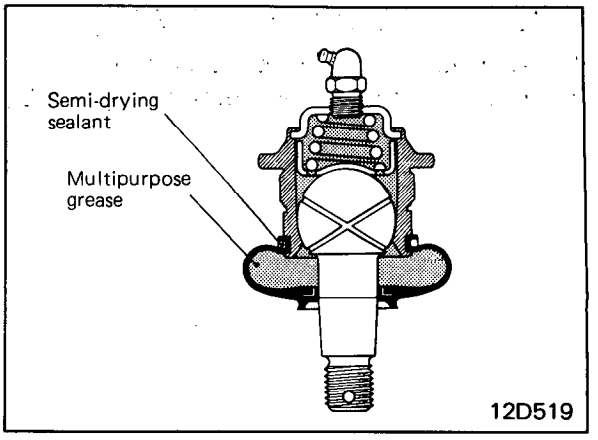
Caution
Be careful not to distort the snap ring.
Check to ensure that there is no play between the ball joint groove and snap ring. If there is play, replace the snap ring with a new one.



6. Apply multipurpose grease to both the interior of the dust cover and the upper ball joint. (12D519)

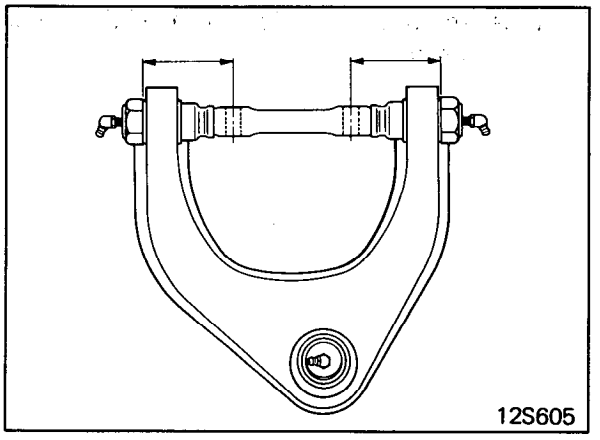
Recommended multipurpose grease .....
SAE J310a, NLGI grade #2EP

7. Apply semi-drying sealant to the grooves in the upper ball joint. (12D519)
8. Secure the dust cover to the upper ball joint with the ring.



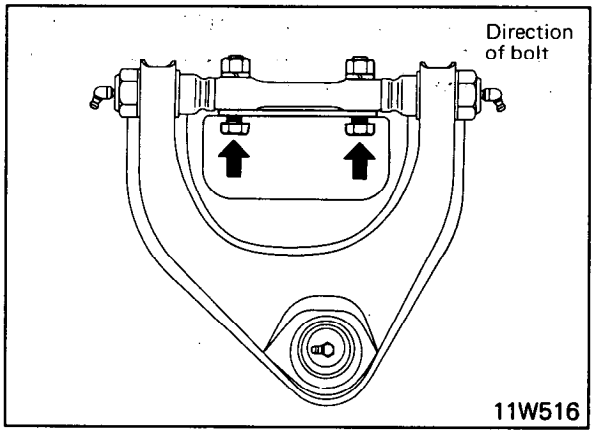
9. Turn the shaft the amount necessary to obtain the reference dimension. (Refer to p. 2-11.)

Caution
The dimension shown in the illustration determine caster.



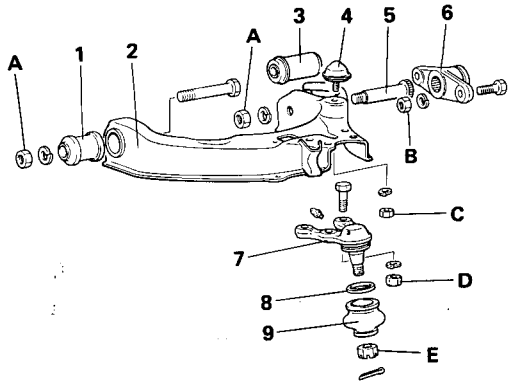
INSTALLATION

1. When installing the upper arm assembly onto the crossmember, insert the upper arm shaft mounting bolts from the outside of the crossmember and put adjusting shims between the crossmember and upper arm shaft. (11W516)
2. Tighten the torsion bar anchor bolts to the reference dimension. (Refer to p. 2-21.)
3. Tighten the lower arm mounting bolts to specifications with the vehicle unladen.
4. Check the wheel alignment.
5. Torque all parts to specifications during assembly.



COMPONENTS

1. Bushing B
2. Lower arm assembly
3. Bushing A
4. Bump stopper
5. Lower arm shaft
6. Anchor arm B
7. Lower ball joint
8. Ring
9. Dust cover



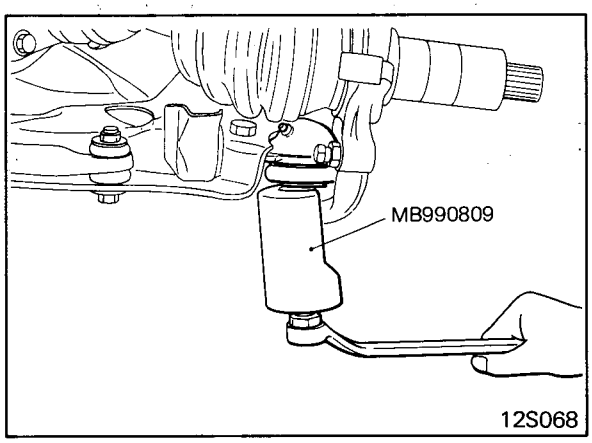
	Nm	ft.lbs.
A*	140-160	101-116
B	95-120	69-87
C	20-30	14-22
D	54-75	39-54
E	120-180	87-130

*To be tightened with vehicle lowered to the ground.

12S038

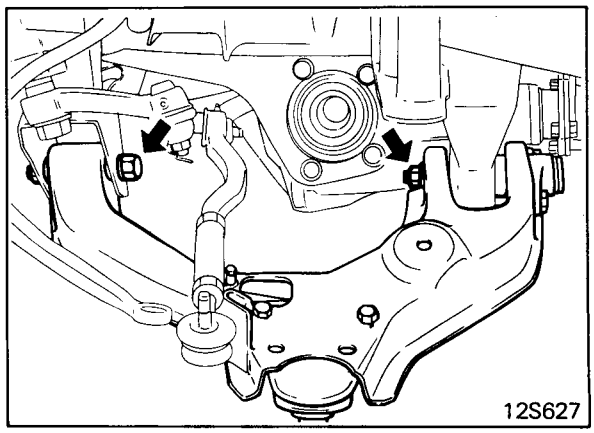
REMOVAL

1. Remove the front skid plate and under cover.
2. Remove the torsion bar. (Refer to p. 2-20.)
3. Remove the stabilizer bar. (Refer to p. 2-23.)
4. Remove the lower portion of the shock absorber. (Refer to p. 2-24.)
5. Remove the nut which retains the lower ball joint to the knuckle.
6. Using the special tool, disconnect the lower ball joint from the knuckle. (12S068)



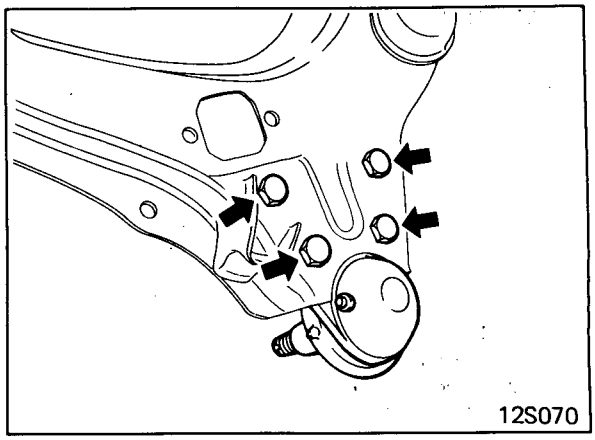
12S068

7. Remove the front mounting bolts of the lower arm. (12S627)
8. Remove the lower arm assembly.
9. Remove anchor arm B if necessary.



12S627

10. Remove the lower ball joint. (12S070)
11. Remove the dust cover and ring.



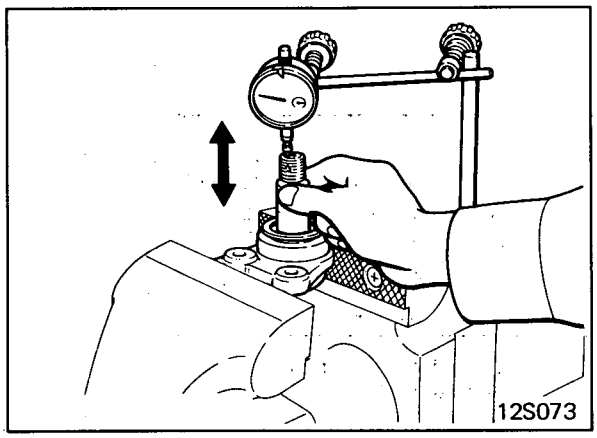
INSPECTION

1. Check lower arm for cracks and deformation.
2. Check anchor arm for worn and damage.
3. Check lower ball joint dust boot for cracks and deterioration.

Measurement of the Lower Ball Joint End Play

1. Measure the lower ball joint end play with a dial indicator. (12S073)

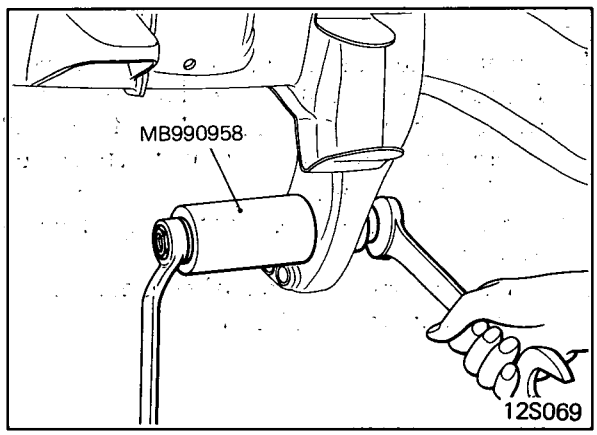
Lower ball joint end play [Service limit]	0.5 mm (.02 in.)



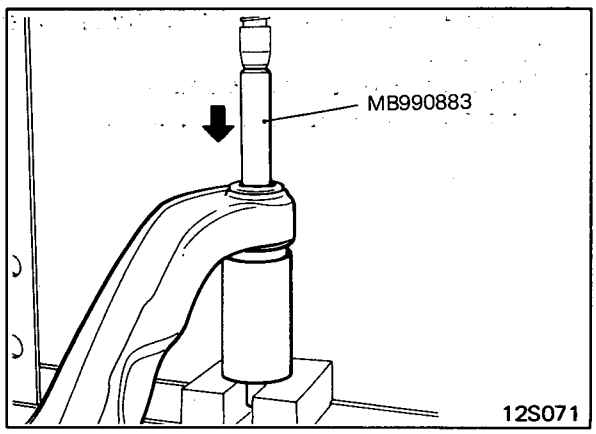
2. If the lower ball joint end play exceeds the service limit, replace the lower ball joint.

Replacement of Lower Arm Bushing

1. Using the special tool, remove bushing A from the crossmember bracket.

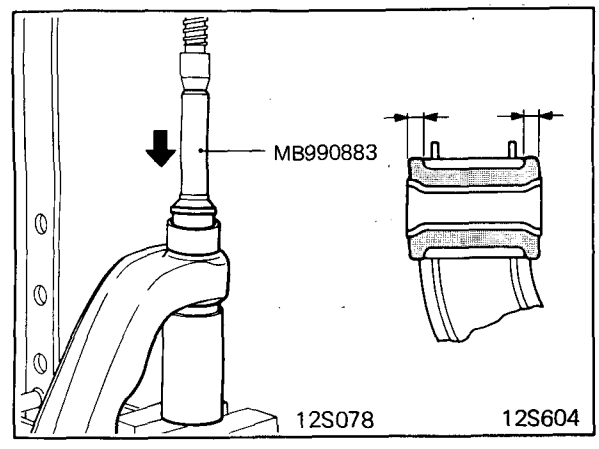


2. Remove bushing B from the lower arm using the special tool.

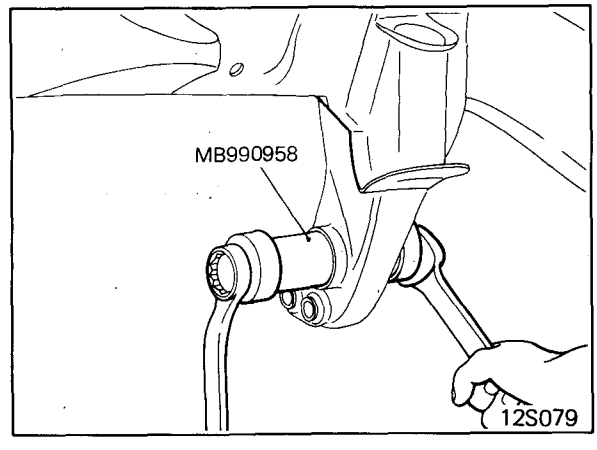


3. Coat bushing B and the lower arm with a soap solution and press bushing B into the lower arm with the special tool. Take care not to twist or tilt bushing B.

NOTE
Press the bushing again from the opposite side if necessary, to equalize the amount of projections at both ends.



4. Using the special tool, press bushing A into the cross-member bracket.

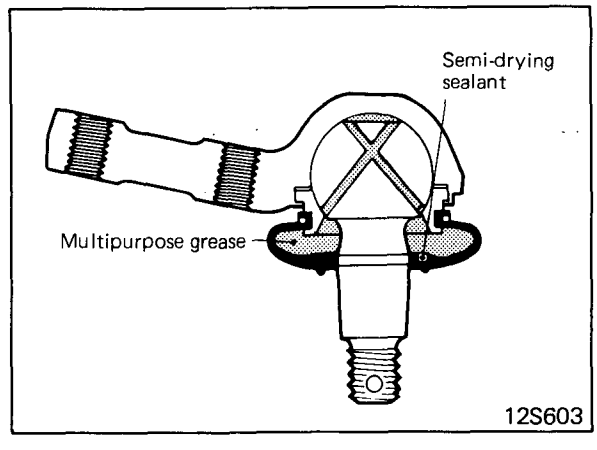


Replacement of Lower Ball Joint Dust Boot

1. Apply the specified multipurpose grease to the interior of the dust cover and to the lower ball joint. (12S603)

Recommended multipurpose grease	SAE J310a, NLGI grade #2EP

2. Apply the specified semi-drying sealant to the grooves in the lower ball joint. (12S603)
3. Secure the dust cover to the lower ball joint with the ring.



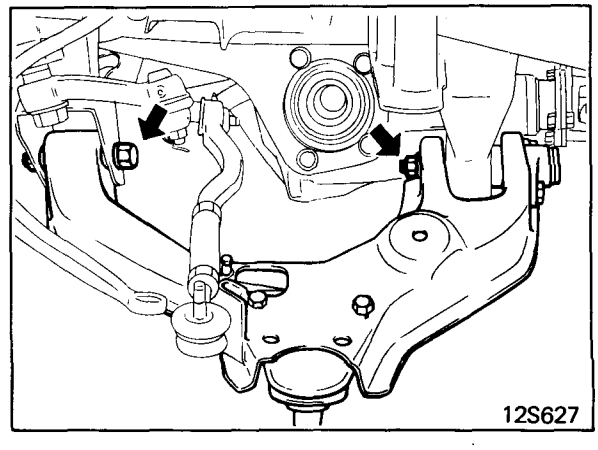
INSTALLATION

1. Temporarily mount the lower arm shaft to the cross-member. (12S627)

NOTE
Work will be easier if a solution of neutral detergent is applied to the lower arm shaft and to the rubber bushing.

Caution
Tighten the lower arm shaft with the vehicle lowered to the ground and unladen.

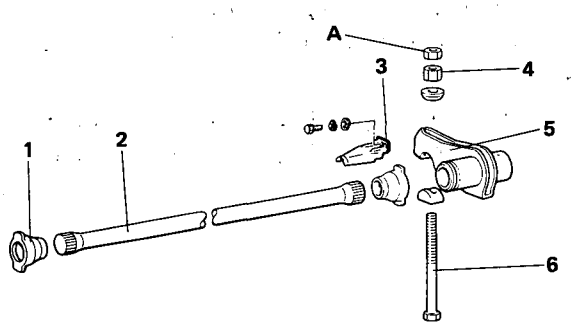
2. Install the shock absorber. (Refer to p. 2-24.)
3. Install the torsion bar. (Refer to p. 2-21.)
4. Install the stabilizer bar. (Refer to p. 2-23.)
5. Torque all parts to specifications during assembly.



COMPONENTS

1. Dust cover
2. Torsion bar
3. Heat protector
4. Adjusting nut
5. Anchor arm assembly
6. Anchor bolt

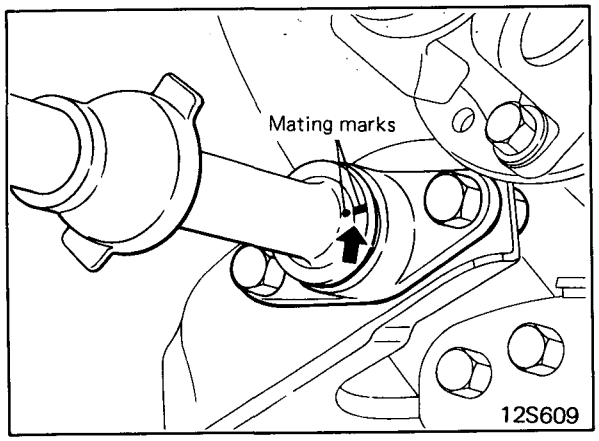
	Nm	ft.lbs.
A	40-50	29-36



12W519

REMOVAL

1. Support the vehicle with floor stands at the specified points.
2. Support the lower arm from which the torsion bar is to be removed, with a jack.
3. Detach the torsion bar dust covers from the anchor arm assembly and anchor arm B, respectively.
4. Put a mating mark on the torsion bar in alignment with the mark on anchor arm B. (12S609)

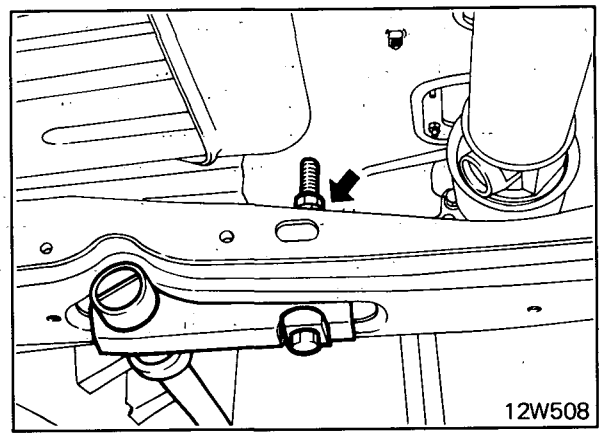


12S609

5. Loosen the adjusting nut and pull the torsion bar out of anchor arm B. (12W508)

NOTE
Remove the anchor arm assembly as necessary to facilitate removal of the torsion bar.

6. Detach the stabilizer bar from the lower arm assembly.


12W508

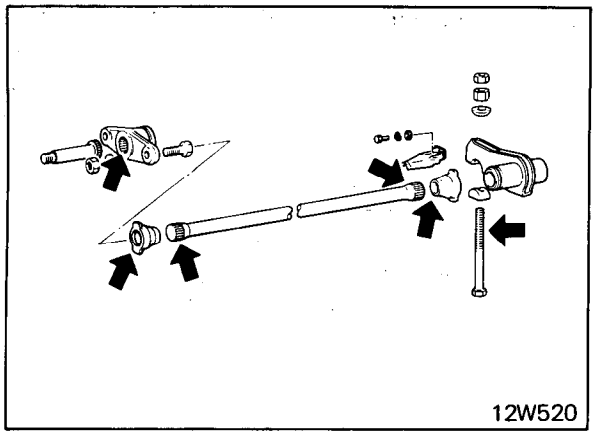
INSPECTION

1. Check torsion bar for bend and damage.
2. Check dust cover for cracks and damage.
3. Check anchor bolt for bend.

INSTALLATION

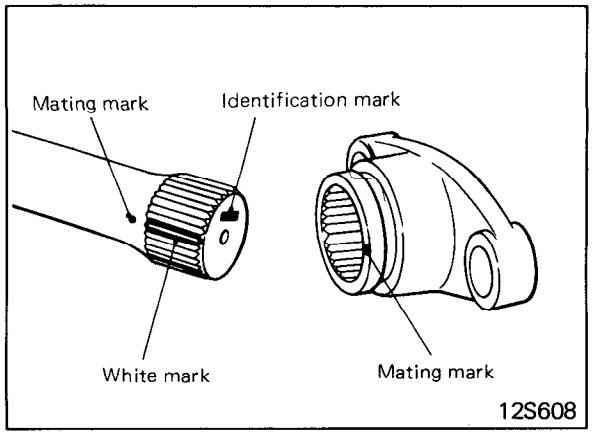
1. Apply multipurpose grease to the torsion bar serrations, the anchor arm assembly serrations, the anchor arm B serrations, the inside of the dust boot and the anchor bolt threads.

Recommended multipurpose grease . . . . . SAE J310a NLGI grade #2EP



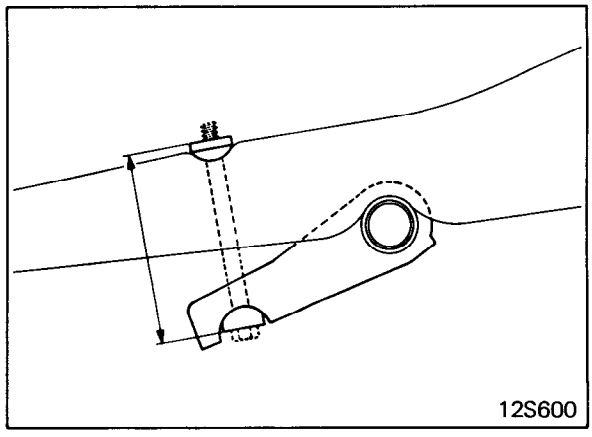
2. Identify the right and left torsion bars referring to the identification mark.
3. When inserting the torsion bar into anchor arm B, face the end having the identification mark forward and align the mark on anchor arm B with the mating mark on the torsion bar. (12S608)

NOTE
When installing a new torsion bar, align the serration which has been painted white with the mark on anchor arm B.



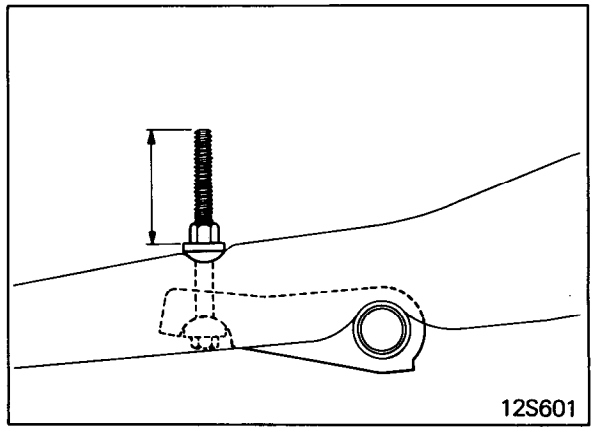
4. Select the relative position of the torsion bar and anchor arm serrations so that the length shown in the illustration is within the specified dimension when the torsion bar and the anchor arm are assembled, with the upper arm rebound stopper in contact with the crossmember.

Anchor arm reference dimension . . . . . L.H. side 138-146 mm (5.43-5.73 in.)
R.H. side 128-136 mm (5.04-5.35 in.)



5. Tighten the adjusting nut so that the anchor bolt protrusion will become the dimension as follows.

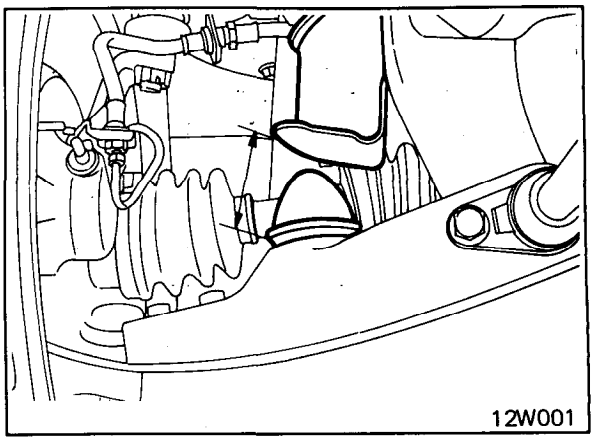
Anchor bolt protrusion . . . . . L.H. 55 mm (2.17 in.)
R.H. 68 mm (2.68 in.)



6. With the vehicle unladen, measure the clearance between the bump stopper and the bump stopper bracket to confirm that it agrees with the specification. (12W001)

Clearance between bump stopper and bump stopper bracket	71 mm (2.8 in.)

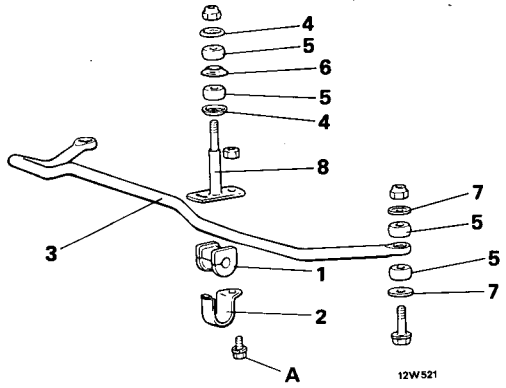
7. If the clearance does agree with the specification, use the adjusting nut on the anchor bolt to adjust it.
8. Torque all parts to specifications during assembly.



COMPONENTS

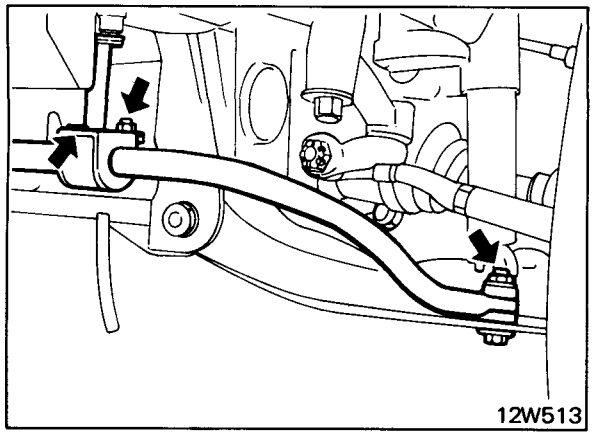
1. Bushing
2. Stabilizer bracket
3. Stabilizer bar
4. Joint cup A
5. Rubber bushing
6. Joint cup B
7. Washer
8. Stabilizer link

	Nm	ft.lbs.
A	8-12	6-9



REMOVAL

1. Support the vehicle with floor stands at the specified points.
2. Remove the skid plate.
3. Remove the stabilizer bar. (12W513)



INSPECTION

1. Check stabilizer bar for deformation or damage.
2. Check stabilizer link for bending or damage.
3. Check bushings for cracks, deterioration or wear.

INSTALLATION

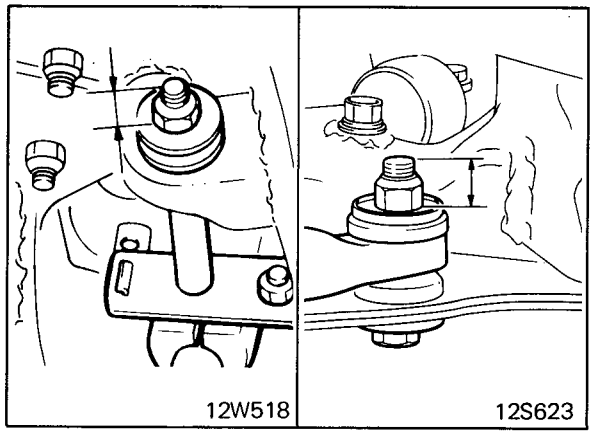
1. When mounting the stabilizer link to the No. 1 crossmember, tighten the nut so as to obtain the specified dimension. (12W518)

   Stabilizer link assembly mounting bolt end reference dimension . . . . . 16-18 mm (.63-.71 in.)

2. When mounting the ends of the stabilizer bar to the lower arms, tighten the nut so as to obtain the specified dimension. (12S623)

   Stabilizer mounting bolt end reference dimension . . . . . 16-18 mm (.63-.71 in.)

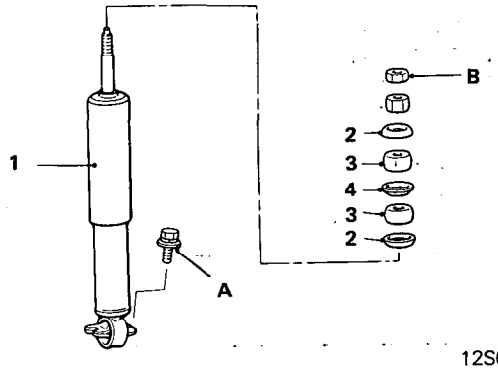
3. Torque all parts to specifications during assembly.



COMPONENTS

1. Shock absorber
2. Joint cup A
3. Bushing
4. Joint cup B

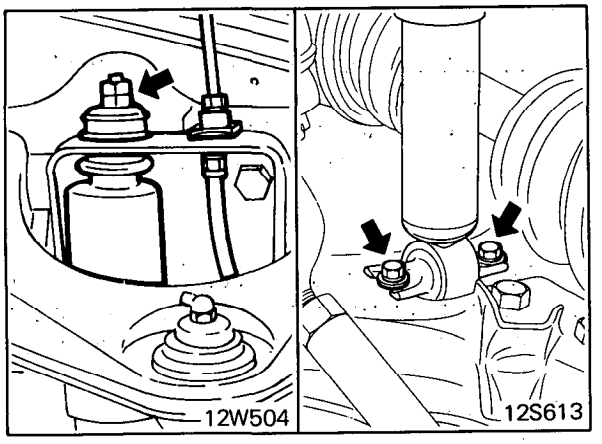
	Nm	ft. lbs.
A	15-22	11-16
B	12-18	9-13



12S087

REMOVAL

Remove the shock absorber.



INSPECTION

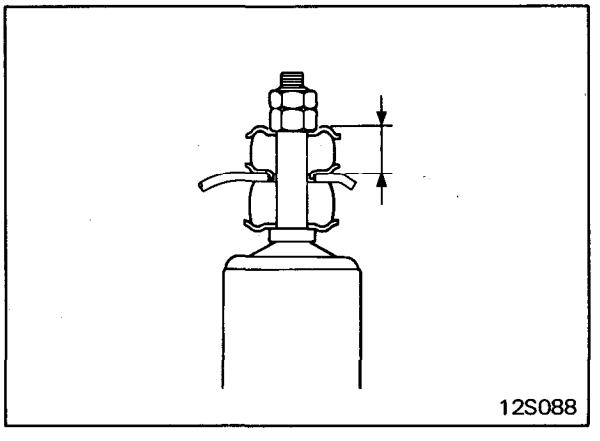
1. Check shock absorbers for malfunctions, oil leakage or noise.

INSTALLATION

1. When mounting the shock absorber to the arm post of the side frame, tighten until the distance from joint cup A to joint cup B agrees with the reference dimension.

   Shock absorber reference dimension . . . . . 16.3 mm (.64 in.)

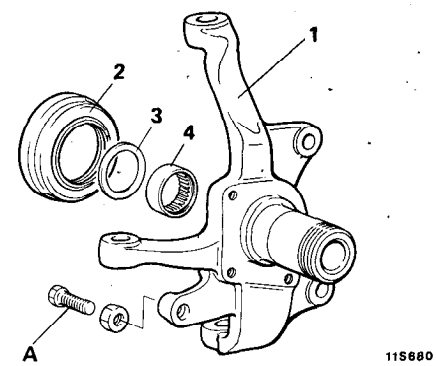
2. Torque all parts to specifications during assembly.



COMPONENTS

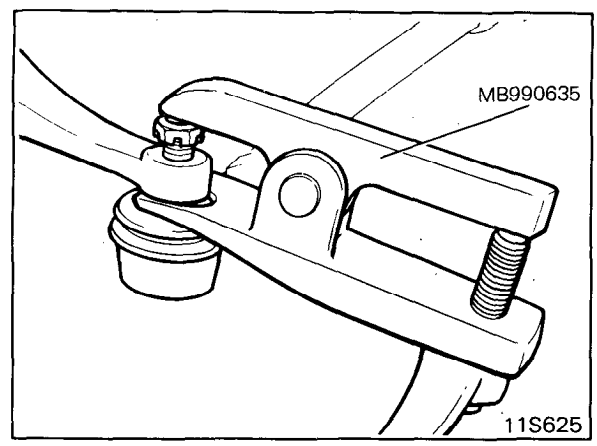
1. Knuckle
2. Oil seal
3. Spacer
4. Needle bearing

	Nm	ft. lbs.
A	50-60	36-43

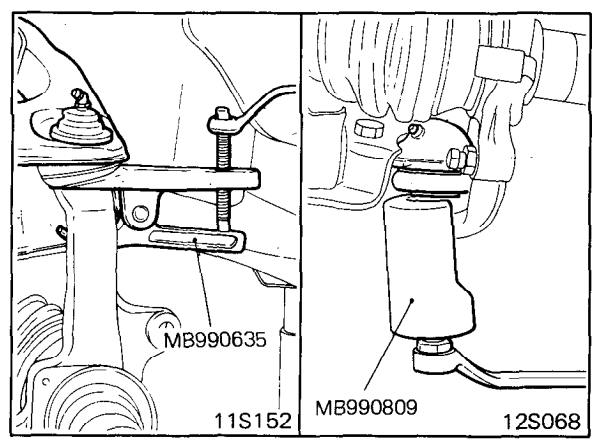


REMOVAL

1. Remove the front hub assembly. (Refer to p. 2-27.)
2. Remove the dust cover.
3. Disconnect the tie rod from the knuckle with a special tool. (11S625)



4. Using the special tools, remove the upper and lower ball joints. (11S152, 12S068)
5. Remove the knuckle from the drive shaft.



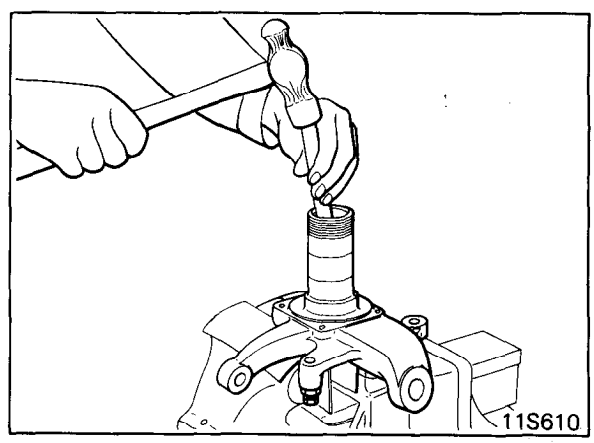
INSPECTION

1. Check needle bearing for wear or damage.
2. Check knuckle for cracks or bends.
3. Check knuckle spindle for wear or pounding.

BEARING REPLACEMENT

1. Remove the oil seal and then remove the spacer.
2. Remove the needle bearing by tapping the needles uniformly. (11S610)

Caution
Once removed, the needle bearing must not be reused.

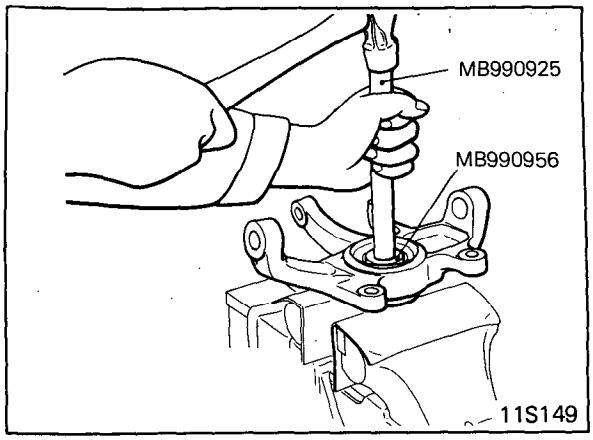


3. Apply the specified multipurpose grease to the roller surface of the new needle bearing.

Recommended multipurpose grease .....
SAE J310a, NLGI grade #2EP

4. Press the needle bearing with the special tools until it is flush with the knuckle end face. (11S149)

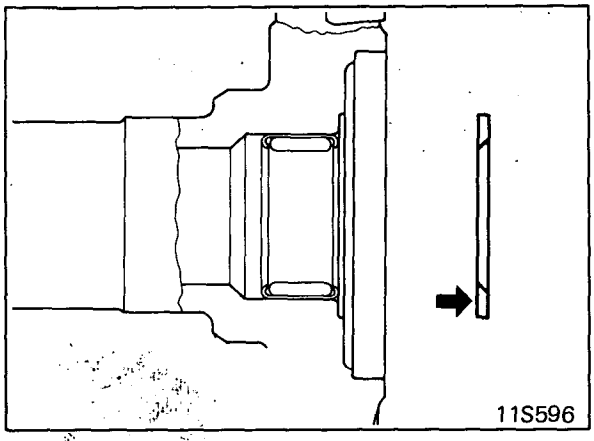
Caution
Use care to avoid driving the needle bearing too far in.



5. Apply the specified multipurpose grease to the knuckle contacting surface of the spacer. (11S596)

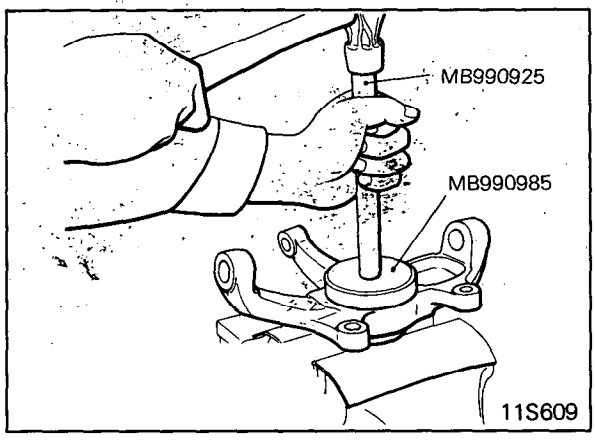
Recommended multipurpose grease .....
SAE J310a, NLGI grade #2EP

6. Install the spacer onto the knuckle with the chamfered side toward the center of vehicle.



7. Press the new oil seal with the special tools until it is flush with the knuckle end face. (11S609)
8. Apply the specified multipurpose grease to the inside and lip of the oil seal.

Recommended multipurpose grease .....
SAE J310a, NLGI grade #2EP

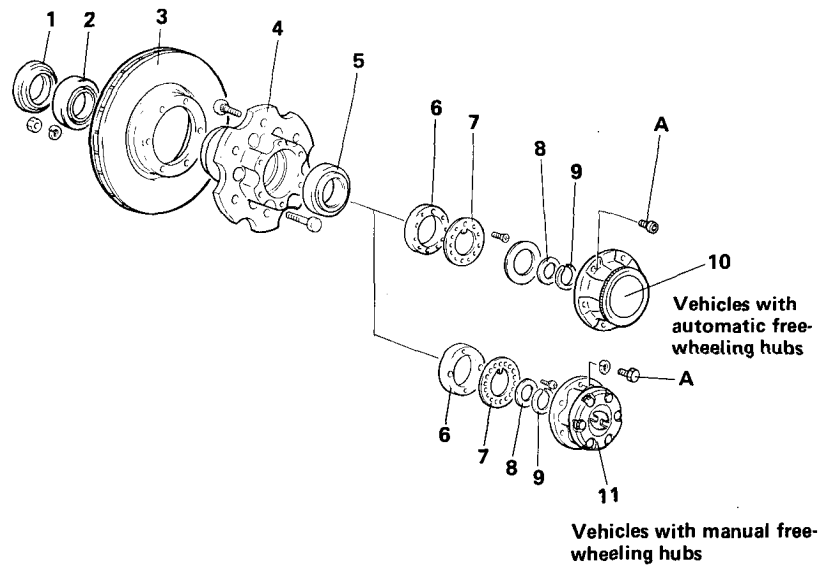


INSTALLATION

1. Install the tie rod. (Refer to GROUP 19.)
2. Install the front hub assembly. (Refer to p. 2-29.)
3. Torque all parts to specifications during assembly.

COMPONENTS

1. Oil seal
2. Inner bearing
3. Brake disc
4. Front hub
5. Outer bearing
6. Lock nut
7. Lock washer
8. Spacer
9. Snap ring
10. Automatic free-wheeling hub assembly
11. Manual free-wheeling hub assembly



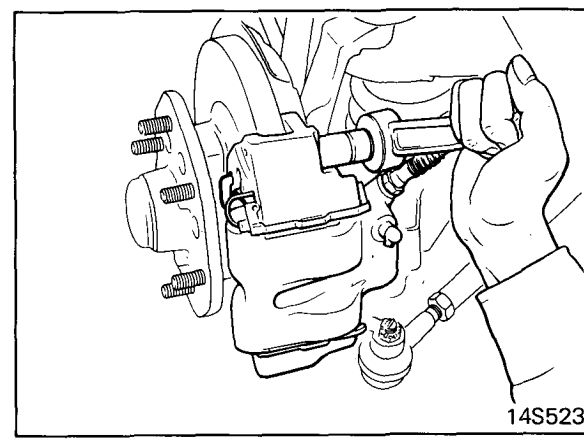
	Nm	ft.lbs.
A	50-60	36-43

11W041

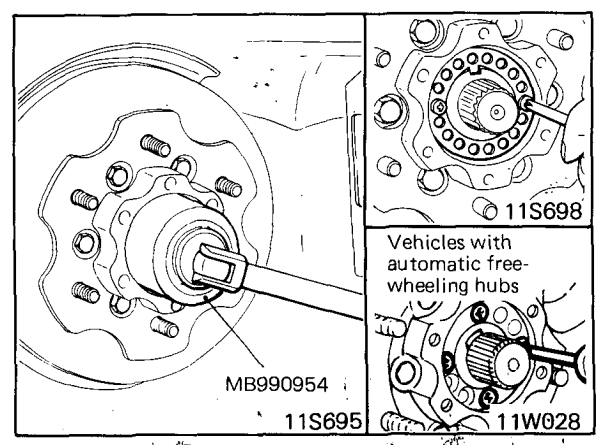
REMOVAL

1. Remove the front caliper assembly. Do not disconnect the brake hose.

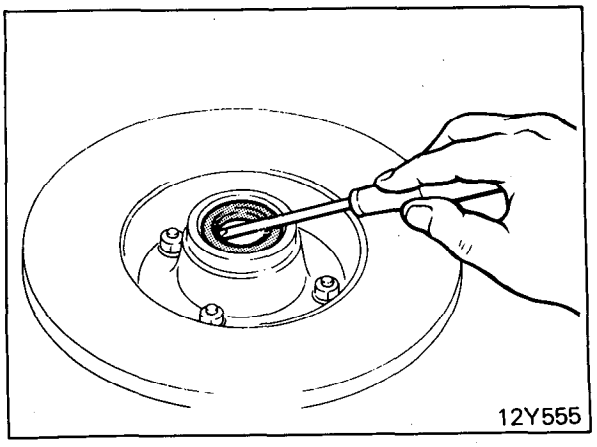
Caution
To prevent the brake hose from being twisted, suspend the brake assembly with wire.



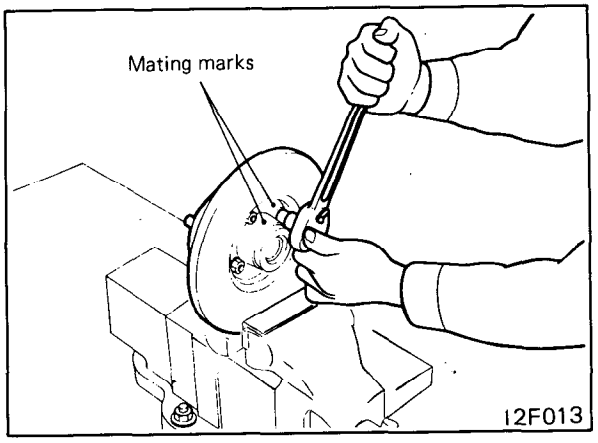
2. Remove the free-wheeling hub. (Refer to p. 2-32, 35.)
3. Remove the lock washer, and then remove the lock nut with a special tool. (11S695)
4. Remove the front hub assembly from the knuckle, together with the inner and outer bearings. (11S698, 11W028)



5. Remove the outer bearing inner race.
6. Remove the oil seal and the inner bearing inner race. (12Y555)



7. If necessary, make the mating marks on the brake disc and front hub and separate the front hub and brake disc.



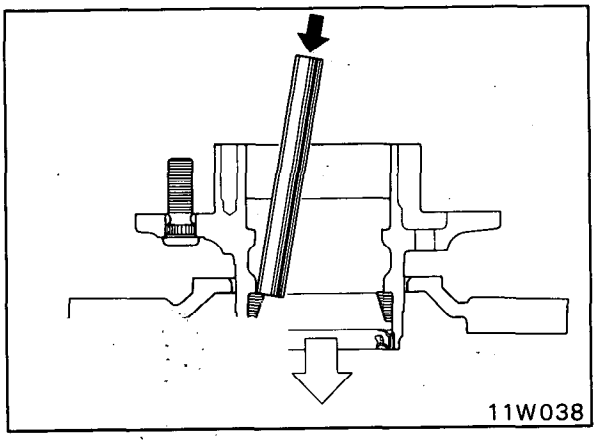
INSPECTION

1. Check wheel bearing for seizure, discoloration and rough raceway surface.
2. Check front hub for cracks.
3. Check oil seals for cracks and damage.

BEARING REPLACEMENT

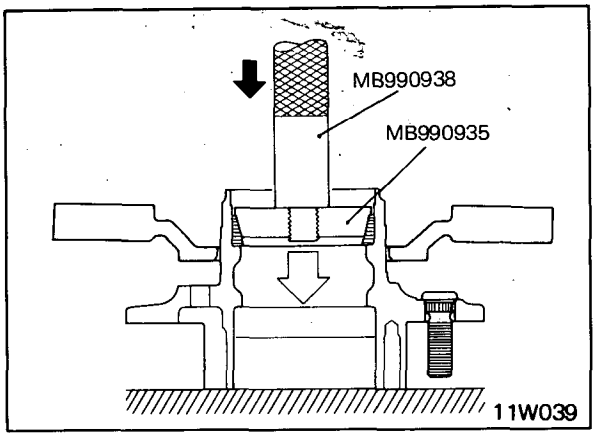
1. Wipe grease from the inside of the front hub.
2. Remove the inner and outer bearing outer races by tapping them uniformly. (11W038)
3. Apply the specified multipurpose grease to the outside surface of the new inner and outer bearing outer races.

Recommended multipurpose grease	SAE J310a, NLGI grade #2EP



4. Install the inner and outer bearing outer races with the special tools.

NOTE
The bearing inner race and outer race should be replaced as an assembly.



INSTALLATION

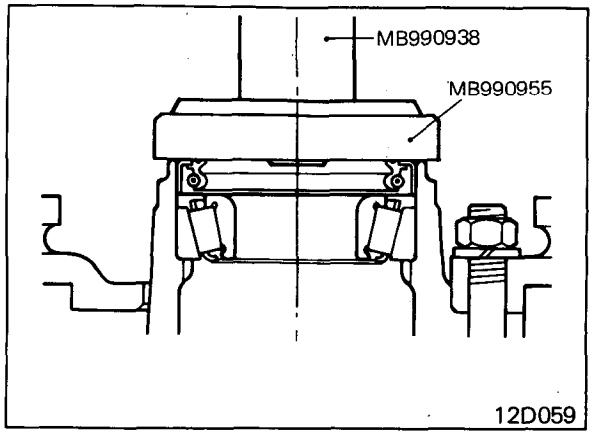
1. Apply the specified multipurpose grease to the outer bearing outer race, oil seal lip and inside surface of the front hub.

Recommended multipurpose grease .....
SAE J310a, NLGI grade #2EP

2. Apply the specified multipurpose grease to the inner bearing inner race and fit the inner race into the front hub.

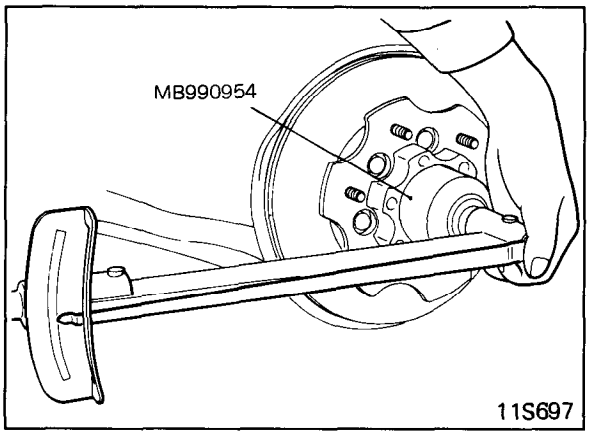
Recommended multipurpose grease .....
SAE J310a, NLGI grade #2EP

3. Press the new oil seal into the front hub with the special tools until it is flush with the front hub end face. (12D059)

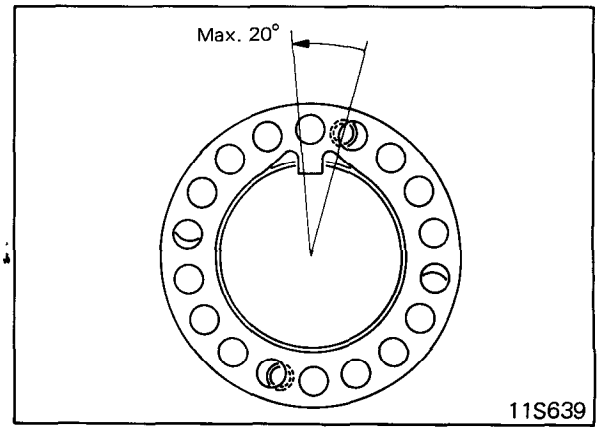


4. Install the front hub assembly as follows:
   (1) Fit the knuckle into the front hub assembly.
   (2) Using a special tool, torque the lock nut as follows. (11S697)

Tighten to 130-200 Nm (95-145 ft.lbs.)
↓
Loosen to 0 Nm (0 ft.lbs.)
↓
Retighten to 25 Nm (18 ft. lbs.) and then loosen to 30°

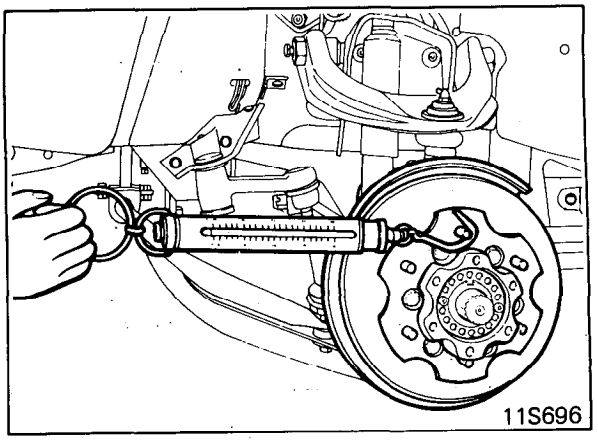


   (3) Install the lock washer. If the lock washer and lock nut holes do not align, align the holes by loosening the nut not more than 20°.



(4) Before installing the free-wheeling hub assembly, measure the turning force of the front hub. If the measured value does not meet the specifications, retigten the lock nut to the specified torque. (11S696)

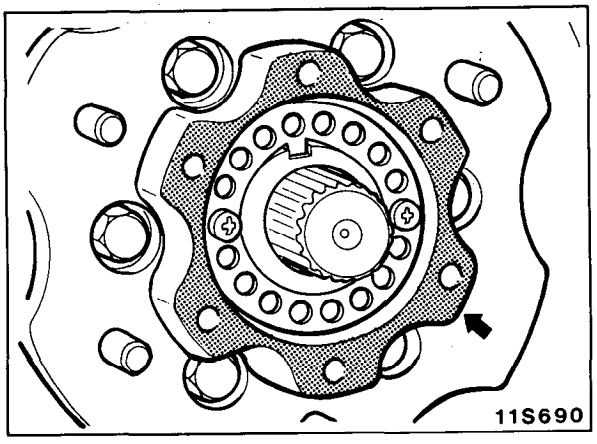
Turning force of front hub assembly .....
4-18 N (0.9-4.1 lbs.)



(5) On vehicles with automatic free-wheeling hubs, adjust the brake contact surface height by adding or removing shims. (Refer to p. 2-40.)

(6) Apply a semi-drying sealant to the free-wheeling hub assembly mounting surface of the front hub and then tighten the front hub to the specified torque. (11S690)

Free-wheeling hub body tightening torque ....
50-60 Nm (36-43 ft.lbs.)



(7) Measure the drive shaft end play. If the measured value does not meet specifications, adjust by adding or removing spacers.

NOTE
For end play measurement and adjustment procedures, refer to p. 2-48.

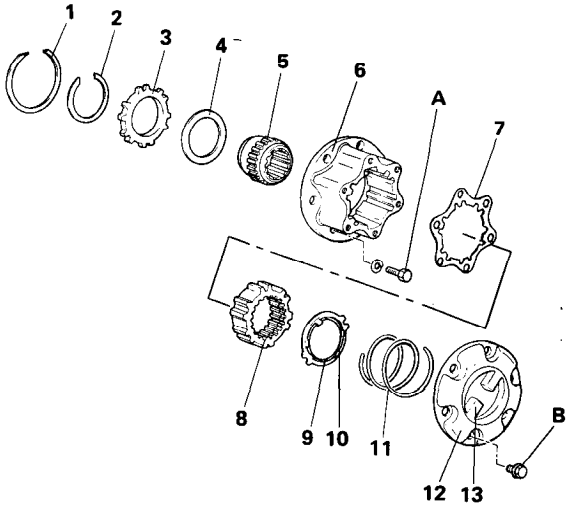
(8) On vehicles with free-wheeling hubs, install the free-wheeling hub cover.

5. Torque all parts to specifications during assembly.

COMPONENTS

1. Wheel snap ring
2. Shaft snap ring
3. Free-wheeling hub ring
4. Spacer
5. Inner hub
6. Free-wheeling hub body
7. Gasket
8. Free-wheeling hub clutch
9. Follower
10. Tension spring
11. Compression spring
12. Free-wheeling hub cover
13. Control handle

	Nm	ft.lbs.
A	50-60	36-43
B	10-14	7-10

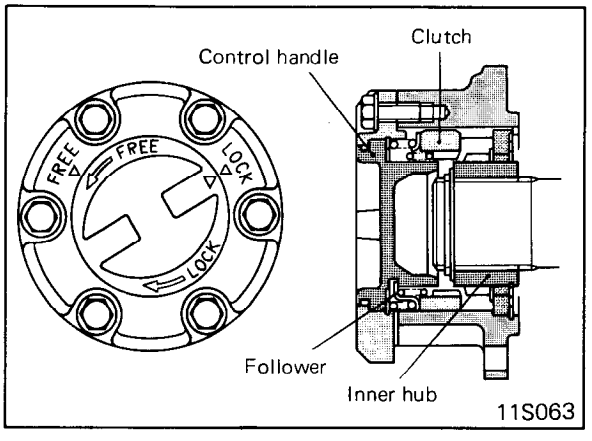


11S693

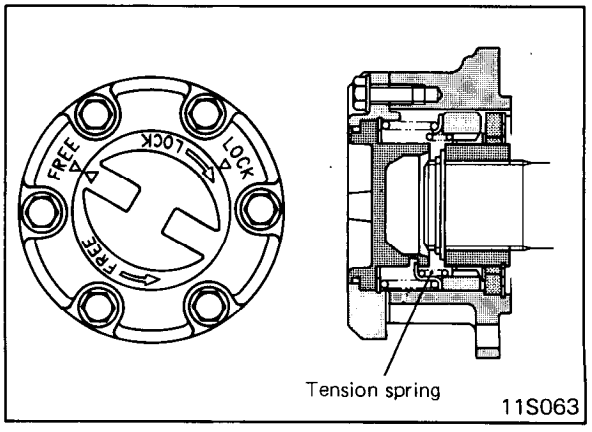
OPERATION

The free-wheeling hub is designed to minimize torque loss by cutting off transmission of front tire rotation to the drive shafts, front differential and front propeller shaft during 2-wheel drive operation. It can disconnect the front wheels from the drive shafts during 2-wheel drive operation and can reconnect them during 4-wheel drive operation.

When the control handle is set to the LOCK position, the follower moves along the oblique groove in the control handle and causes the clutch (which is always in mesh with the free-wheeling hub body) to engage the splines of the inner hub, thus coupling the free-wheeling hub body with the drive shaft. When the control handle is set to the FREE position, the follower moves along the oblique groove in the control handle and uses the tension spring to disengage the clutch from the splines of the inner hub, thus separating the free-wheeling hub body from the drive shaft.



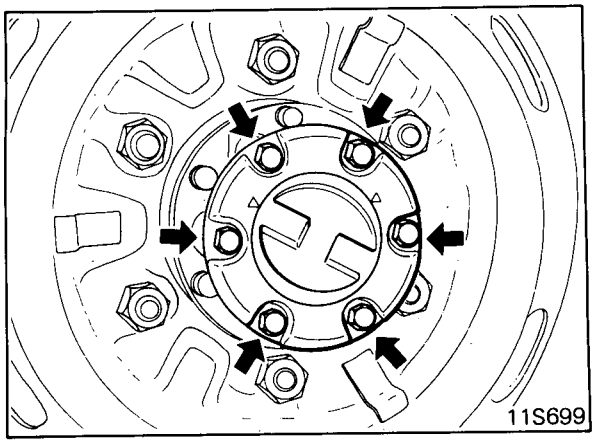
11S063



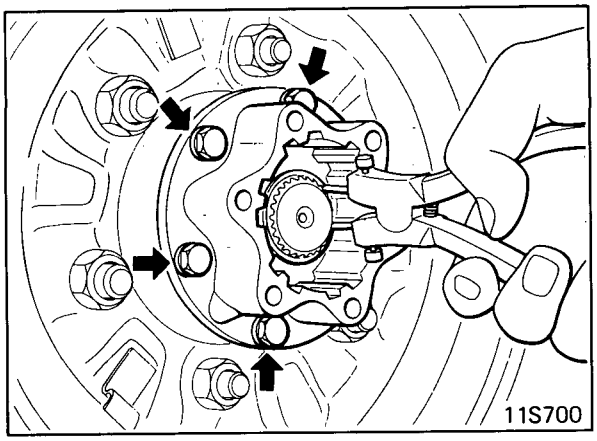
11S063

REMOVAL

1. Set the control handle to the FREE position. Remove the free-wheeling hub cover.

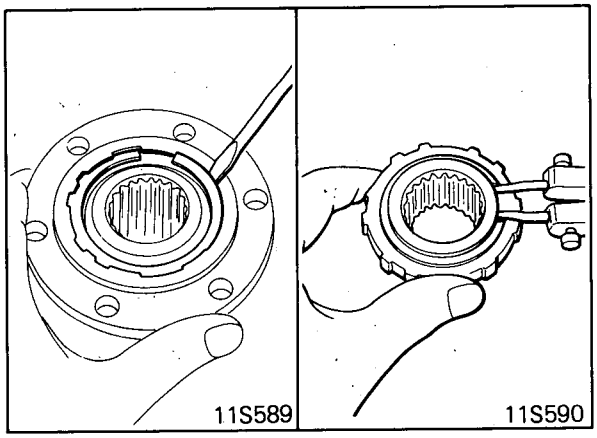


2. Remove the snap ring from the drive shaft, with snap ring pliers. (11S700)
3. Remove the free-wheeling hub assembly from the front hub. (11S700)



DISASSEMBLY

1. Using a screwdriver, remove the snap ring and the inner hub from the free-wheeling hub body. (11S589)
2. Remove the snap ring from the inner hub with snap ring pliers. (11S590)



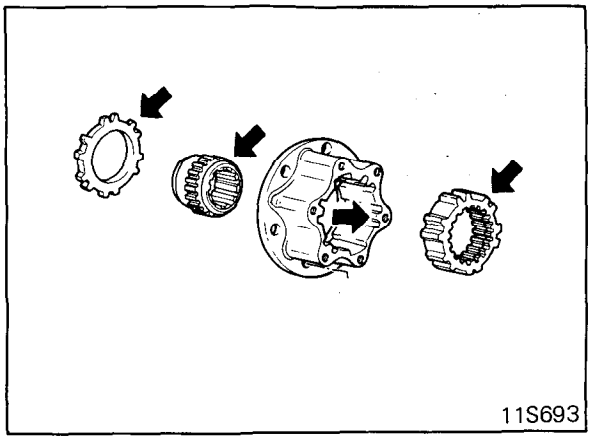
INSPECTION

1. Check free wheeling hub ring, inner hub, free-wheeling hub body, and clutch for wear and seizure.
2. Check gasket for damage.
3. Check compression spring and tension spring for deterioration.

REASSEMBLY

Apply the specified multipurpose grease to the entire periphery of the free-wheeling hub ring, inner hub and free-wheeling hub clutch, and the inside of the free-wheeling hub body.

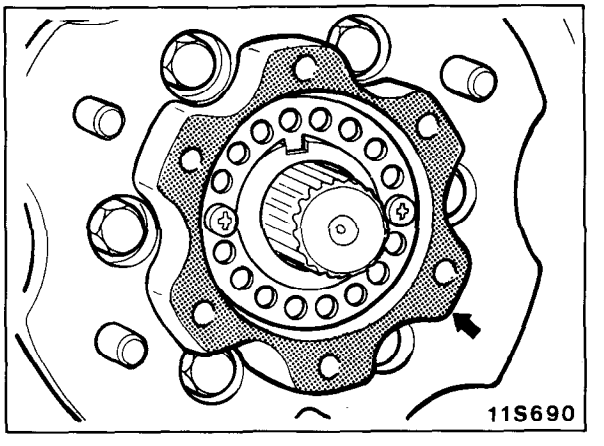
Recommended multipurpose grease . . . . . SAE J310a, NLGI grade #2EP



INSTALLATION

1. Apply semi-drying sealant to the front hub mounting surface of the free-wheeling hub body assembly and then tighten the assembly to the specified torque. (11S690)

Free-wheeling hub body tightening torque . . . . . 50-60 Nm (36-43 ft.lbs.)



2. Measure the drive shaft end play. (Refer to p. 2-12.)
3. If the measured value does not agree with the specifications, adjust by using a spacer.

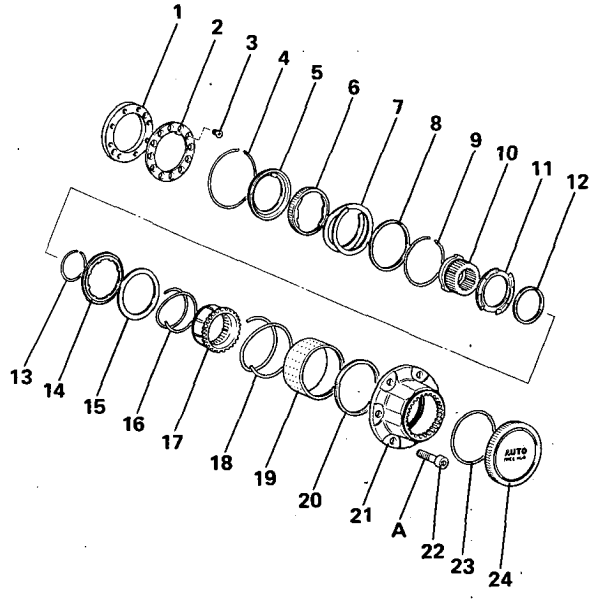
NOTE
For play measurement and adjustment procedures, refer to p. 2-48.
Install the free-wheeling hub cover with the control handle and clutch in the FREE position.

4. Torque all parts to specifications during assembly.

COMPONENTS

1. Lock nut
2. Lock washer
3. Screw
4. Housing C-ring
5. Brake (B)
6. Brake (A)
7. Brake spring
8. Housing snap ring
9. Retainer (B) C-ring
10. Drive gear
11. Retainer (A)
12. Drive gear snap ring
13. Slide gear C-ring
14. Cam
15. Spring holder
16. Shift spring
17. Slide gear
18. Return spring
19. Retainer (B)
20. Thrust washer
21. Housing
22. Bolt
23. O-ring
24. Cover

	Nm	ft.lbs.
A	50-60	36-43



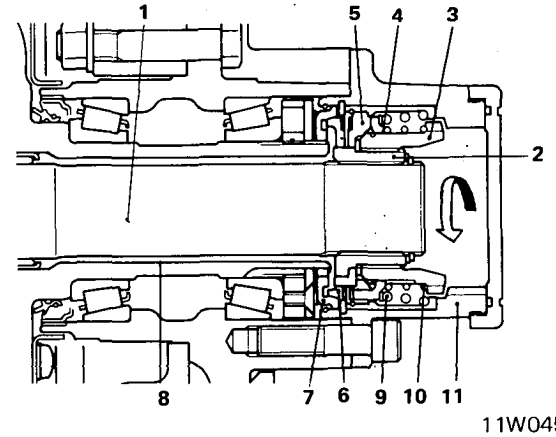
11W034

CONSTRUCTION AND OPERATION

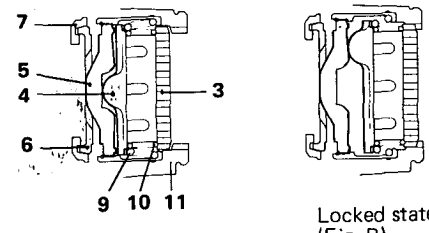
Free State → Locked State

When the transfer is shifted from 2WD (2-wheel drive) to 4WD (4-wheel drive) and driving is begun, rotation of the drive shaft (1) is transmitted from the drive gear (2) to the slide gear (3) to the cam (4) to retainer A (5) to brake A (6). When this happens, brake A (6) is pressed against brake B (7) by the function of the cam of retainer A (5) , and friction force is generated.

Because brake B (7) is secured to the knuckle (8), retainer A (5) ceases to rotate, (see Fig. A), and therefore, the cam (4), while compressing the return spring (9), rises out of the cam groove of the retainer A (5) and compresses the shift spring (10). The slide gear (3) is pushed by the shift spring (10), and then engages with the gear of the housing (11) when the two are in phase and enters the locked state (see Fig. B).



11W045



Free state
(Fig. A)

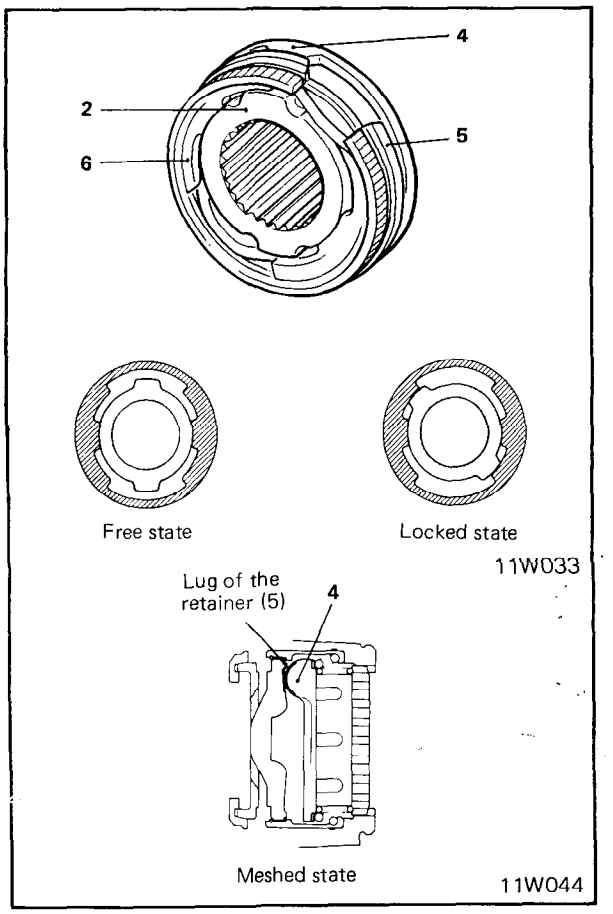
Locked state
(Fig. B)

11W043

The cam (4) turns until the lug of the drive gear (2) contacts the lug of brake A (6). Because of this contact, brake A (6) is turned by the drive gear (2), and therefore, there is also no longer any force of retainer A (5) with a tendency to turn brake A (6). As a result, there is also no longer any force which presses brake A (6) against brake B (7) and the drive gear (2) causes brake A (6) to turn lightly (there is no friction force).
Because the cam (4) remains meshed, it turns until it contacts the lug of retainer A (5), and is locked.

Locked State → Free State

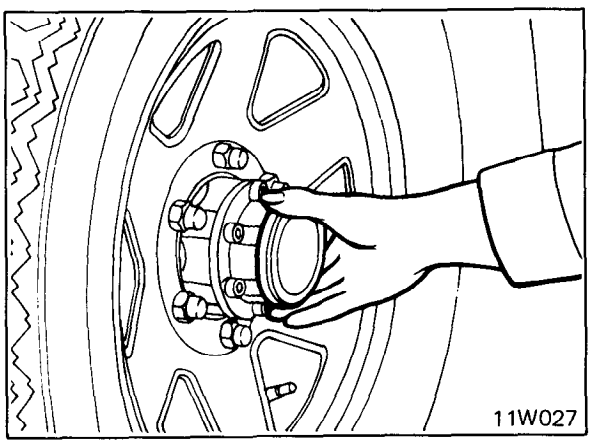
When the transfer is shifted from 4-WHEEL DRIVE to REAR-WHEEL DRIVE and the vehicle is driven in reverse, rotation of the gear of the housing (11) is transmitted from the slide gear (3) to cam (4) to retainer A (5) to brake A (6), but retainer A (5) ceases to turn, just as when the shift is made from the free state to the locked state. The cam (4), therefore, turns as far as the cam groove of retainer A (5) and is pushed into the cam groove by the return spring (9). The slide gear (3) moves with the cam (4), disengages from the gear of the housing (11), and enters a free state.



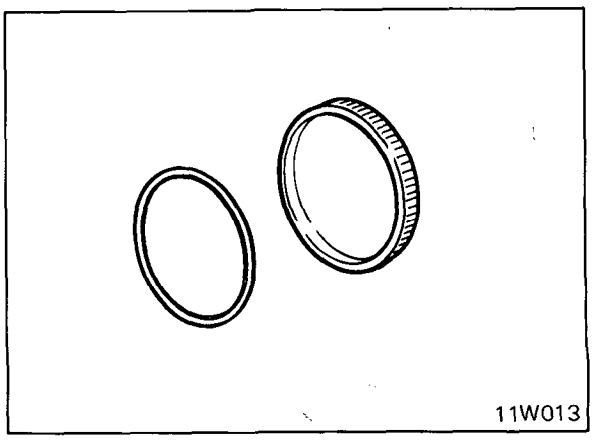
REMOVAL

1. Remove the automatic free-wheeling hub cover.

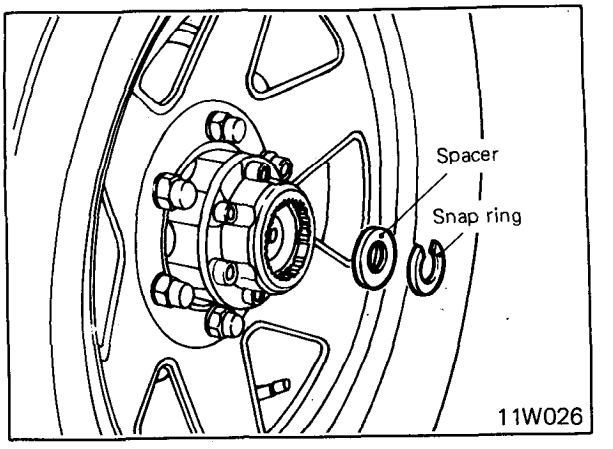
NOTE
When the cover cannot be loosened by hand, protect the cover with a shop towel to avoid damaging it and use an oil filter wrench to loosen it.



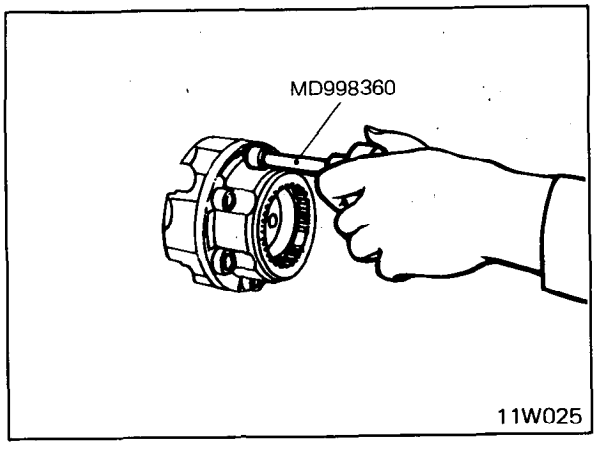
2. Remove the O-ring from the automatic free-wheeling hub cover.



3. Remove the snap ring and then remove the spacer.



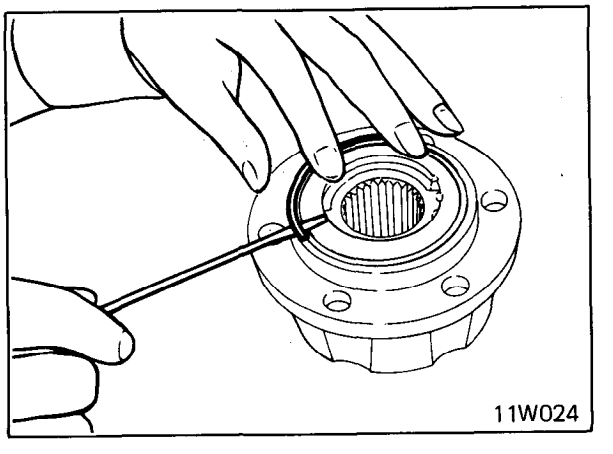
4. Using a special tool, remove the automatic free-wheeling hub.



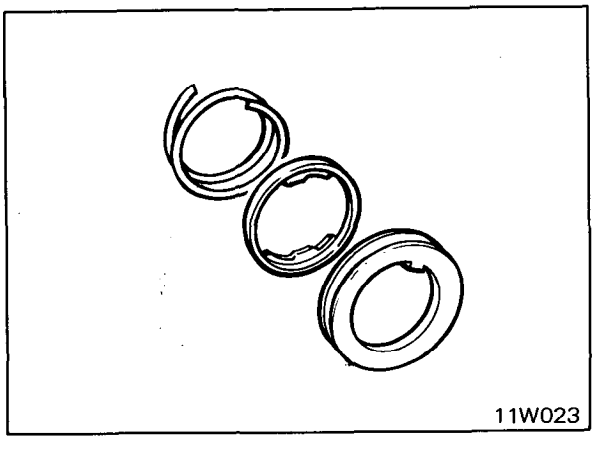
DISASSEMBLY

1. Remove the housing C-ring.

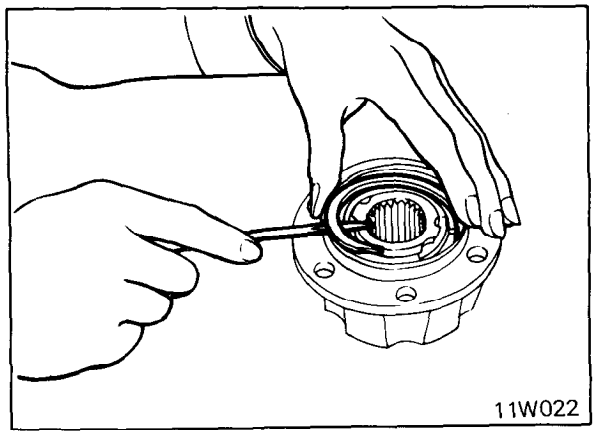
NOTE
The ring can be easily removed by pushing in brake B and using a small-tipped screwdriver or similar tool.



2. Remove brake A, brake B and the brake spring.



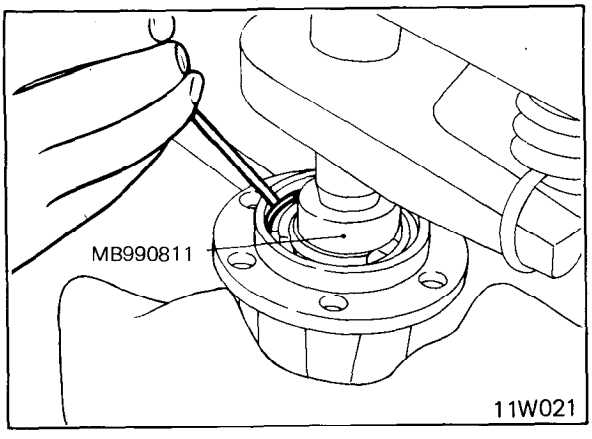
3. Remove the housing snap ring.



4. Using the special tool, lightly push in the drive gear and remove the retainer B C-ring. (11W021)

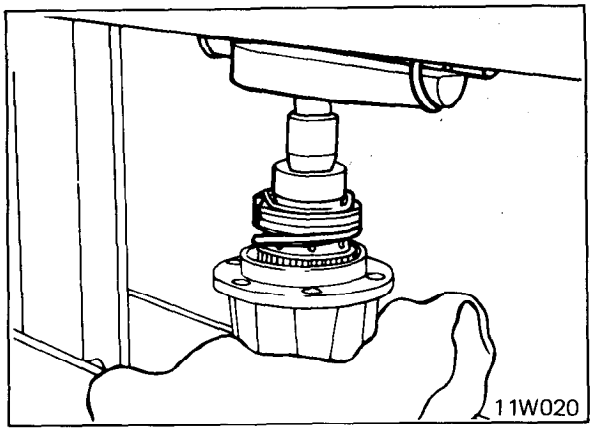
NOTE
Because the return spring relaxes approx. 40 mm (1.57 in.), the stroke of the press should be set to more than 40 mm (1.57 in.)

Caution
Place a protective cloth under the cover attaching surface of the housing before setting on the press table.
Make sure that the pressing force does not exceed 200 N (441 lbs.).

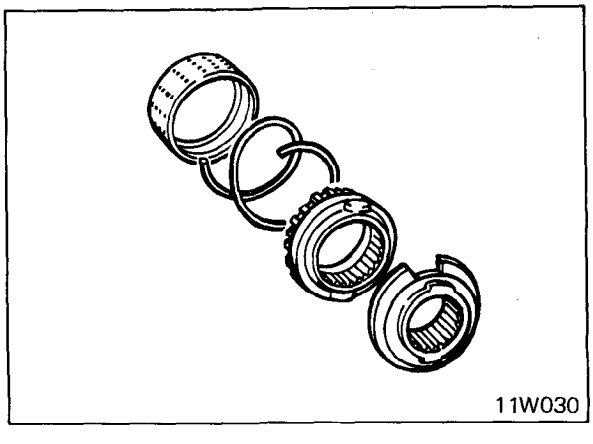


5. Slowly reduce the pressure of the press until the return spring fully relaxes.

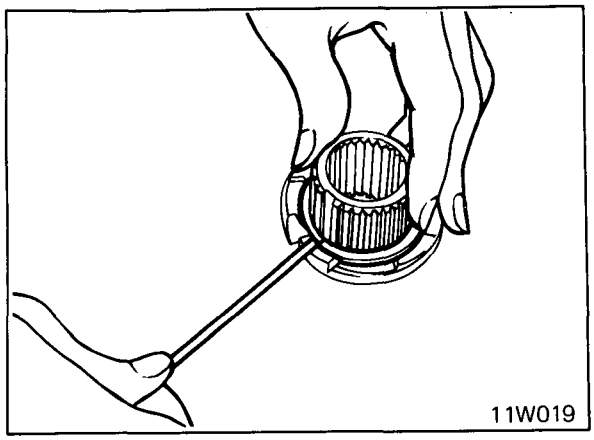
Caution
When reducing the pressure of the press, be sure that retainer A is not caught by retainer B.



6. Remove the following parts from the housing.
   (1) Retainer B
   (2) Return spring
   (3) Slide gear assembly
   (4) Drive gear assembly

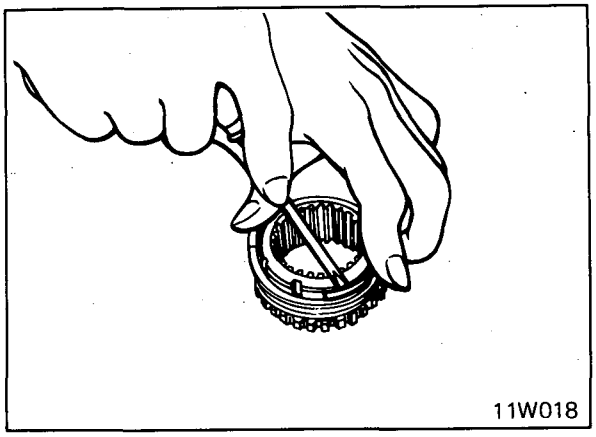


7. Remove the drive gear snap ring.



Caution
When the drive gear snap ring is removed, be sure to replace it with a new one.

8. Push in the cam and remove the slide gear C-ring while the spring is compressed.



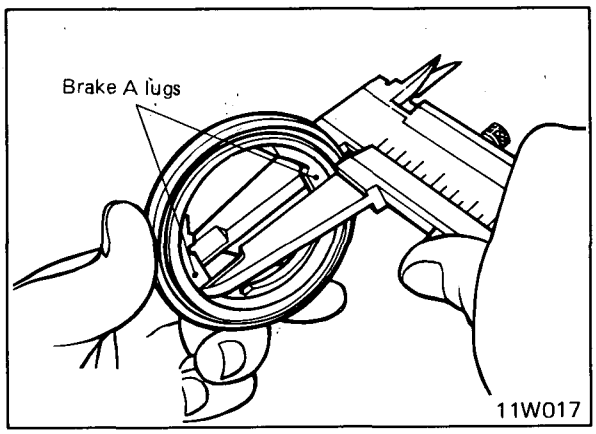
INSPECTION

1. Check drive gear and slide gear splines for damage.
2. Check cam portion of retainer (A) for wear and damage.
3. Check cam for wear and damage.
4. Check slide gear and housing tooth surfaces for damage.
5. Check retainer B and housing contact surfaces for wear and damage.

Brake Wear

(1) Assemble brake A and brake B, set the vernier callipers so that the measuring jaws simultaneously touch the two lugs of brake A, and then measure the combined brake thickness. (11W017)

Brake A wear [Repair limit] . . . . . 9.6 mm (.38 in.)



Caution
To equalize the combined brake thickness, make sure that the measuring jaws of the vernier callipers simultaneously touch both lugs.

(2) If the measured value is below the service limit, replace brake A and brake B as a set.

Deterioration of Return Spring

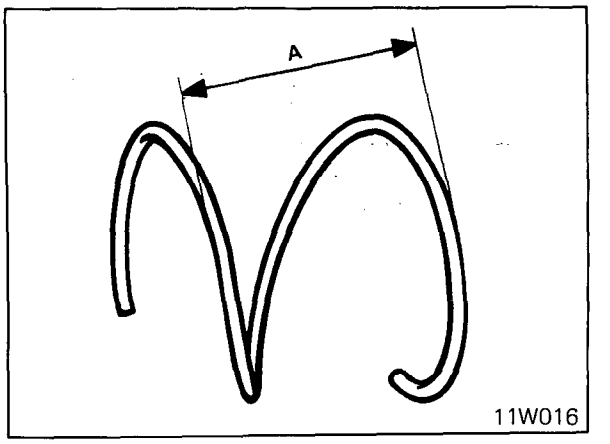
(1) Measure dimension A as shown. (11W016)

Return spring deterioration [Repair limit]	35 mm (1.4 in.)

Caution

To measure the dimension A shown in illustration, measure the dimension from the outermost extremity of one wire diameter to that of the other wire diameter.

(2) If the measured value is below the service limit, replace the spring.



Deterioration of Shift Spring

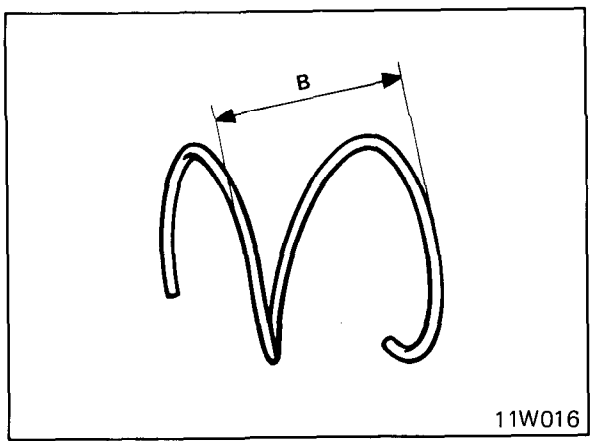
(1) Measure dimension B as shown. (11W016)

Shift spring deterioration [Repair limit]	30 mm (1.2 in.)

Caution

To measure the dimension B, measure the dimension from the outermost extremity of one wire diameter to that of the other wire diameter.

(2) If the measured value is below the service limit, replace the spring.



REASSEMBLY

1. Apply the specified grease to the mounting surfaces of all components.

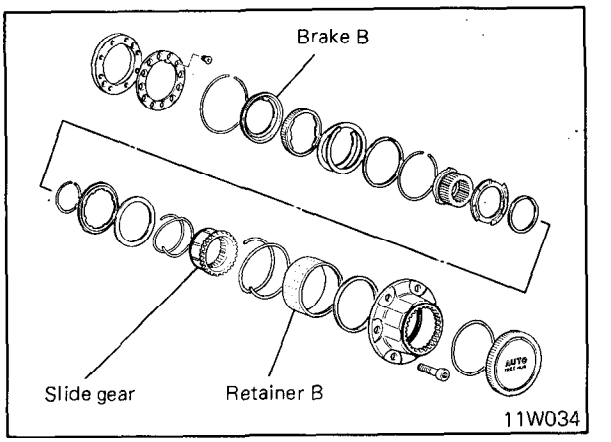
Recommended multipurpose grease	SAE J310a, NLGI grade #2EP

2. Pack the grooves of brake B and retainer B with the specified grease.

Recommended multipurpose grease	SAE J310a, NLGI grade #2EP

3. Apply the specified grease to the slide gear. Install the return spring with the smaller coil diameter side toward the spring seat.

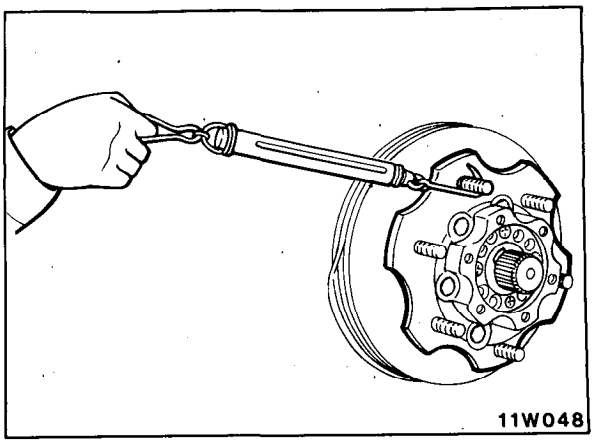
Recommended multipurpose grease	SAE J310a, NLGI grade #2EP



INSTALLATION

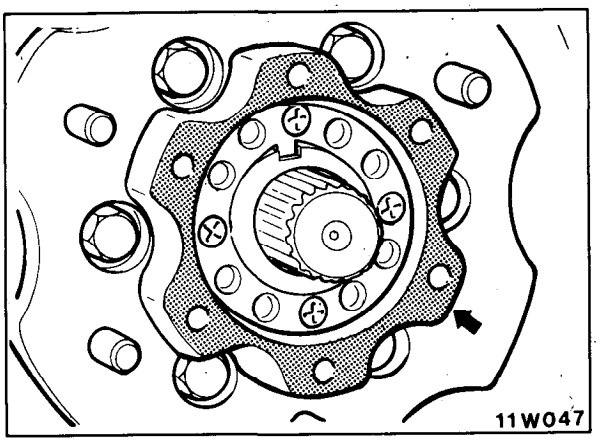
1. Measure the starting torque of the front hub assembly. If the measured value is not within the standard value range, adjust by using the lock nut.

Turning force of front hub assembly	4-18 N (0.9-4.1 lbs.)

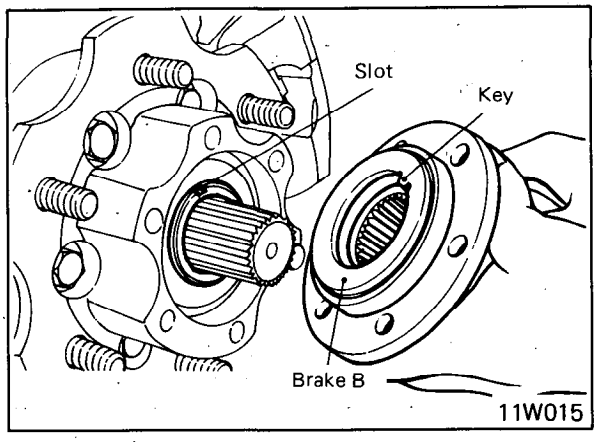


2. Apply a semi-drying sealant to the hub surface.

Caution
Make sure that there is no excess sealant on the outside of the hub.

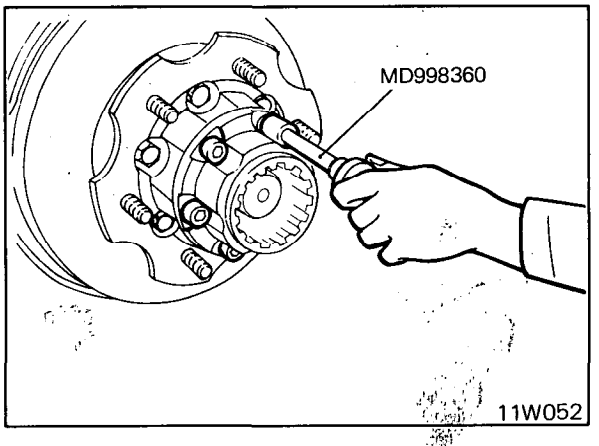


3. Aligning the key of brake B with the slot in the knuckle spindle and loosely install the automatic free-wheeling hub assembly. (11W015)
4. Confirm that the hub and the automatic free-wheeling hub assembly are in close contact when the assembly is forced lightly against the hub. If not, turn the hub until close contact is obtained.



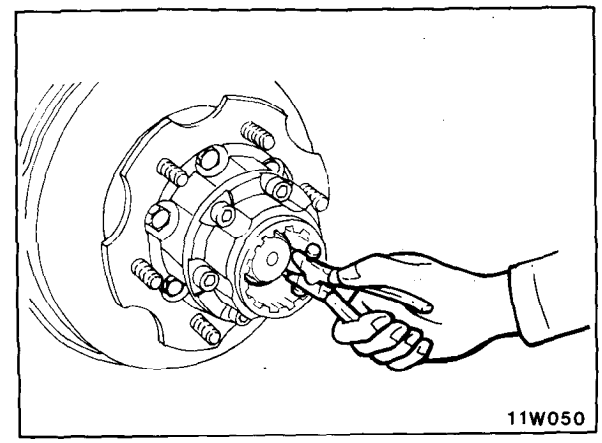
5. Using the special tool, tighten the automatic free-wheeling hub mounting bolts to the specified torque.

Free-wheeling hub body tightening torque	50-60 Nm (36-43 ft.lbs.)



6. Adjust the drive shaft end play as follows.
   (1) Install the snap ring on the drive shaft.

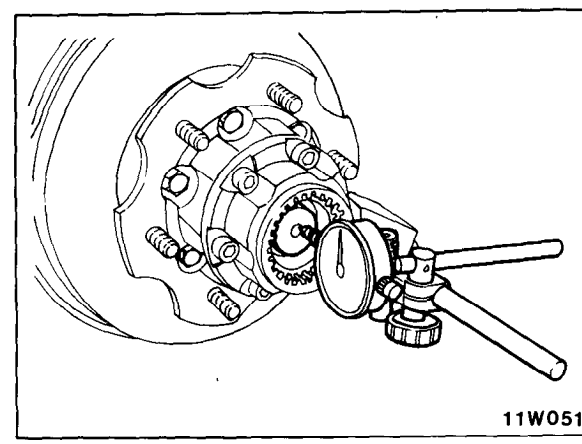
NOTE
Do not install any shims.


11W050

   (2) Position the dial indicator at the end of the drive shaft. (11W051)

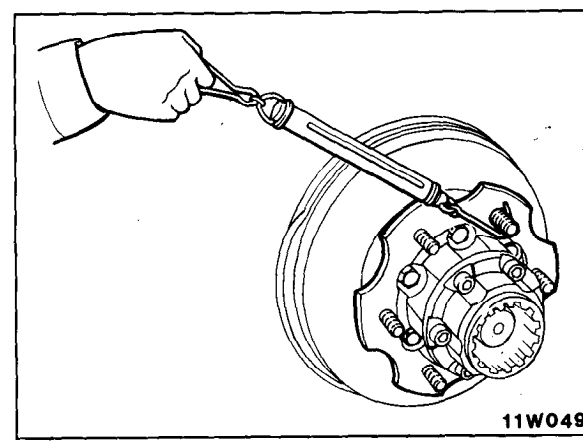
Caution
Secure the magnetic base to the hub or brake disc.

   (3) Turn the drive shaft in the forward and reverse directions until resistance is felt to find the center of the turning stroke. At this position, move by hand the drive shaft in the axial direction to measure the play. If the measured value is not within the standard value range, select an adequate shim and install it on the drive shaft.


11W051

Drive shaft end play	0.2-0.5 mm (.008-.020 in.)

7. Measure the starting torque of the front hub assembly and compare it with that measured before installation of the automatic free-wheeling hub assembly. If the difference exceeds 14 N (3.1 lbs.), the automatic free-wheeling hub is probably not installed correctly; remove and reinstall all it. (11W049)
8. Install the front brake assembly and tighten the bolts to the specified torque.


11W049

Front brake assembly tightening torque	70-90 Nm (43-65 ft.lbs.)

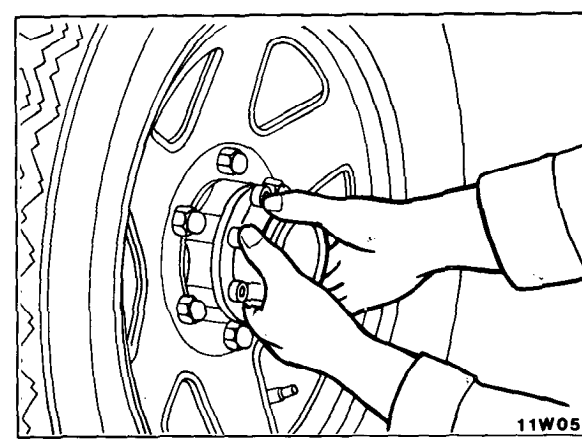
9. Mount the wheel and lower the vehicle.
10. Tighten the wheel nuts to the specified torque.

Wheel nuts tightening torque	70-80 Nm (43-58 ft.lbs.)

11. Apply the specified grease to the O-ring before mounting it onto the cover.

Recommended multipurpose grease	SAE J310a, NLGI grade #2EP

12. Install the cover with both hands securely. (11W053)


11W053

COMPONENTS

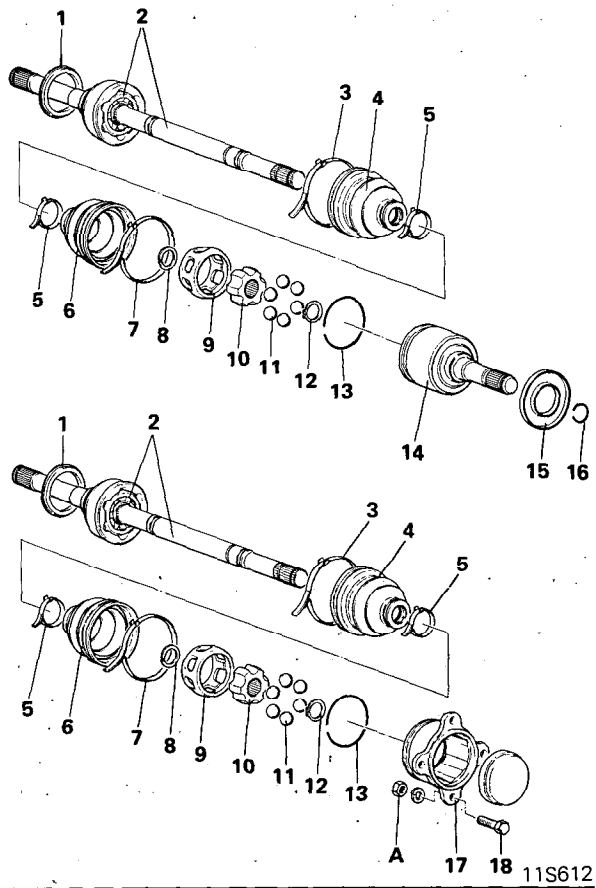
1. Dust cover
2. Drive shaft and B.J.
3. Boot band A
4. B.J. boot
5. Boot band C
6. D.O.J. boot
7. Boot band B
8. Circlip
9. D.O.J. cage
10. D.O.J. inner race
11. Ball
12. Snap ring
13. Circlip
14. D.O.J. outer race
15. Dust cover
16. Circlip
17. D.O.J. outer race
18. End plate

NOTE
D.O.J. : Double offset joint
B.J. : Birfield joint

	Nm	ft.lbs.
A	50-60	36-43

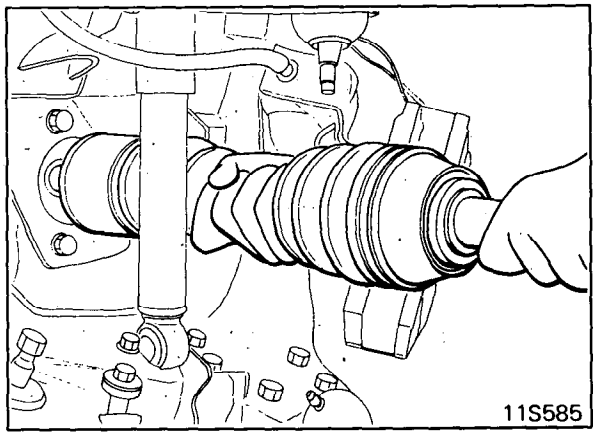
Left drive shaft

Right drive shaft



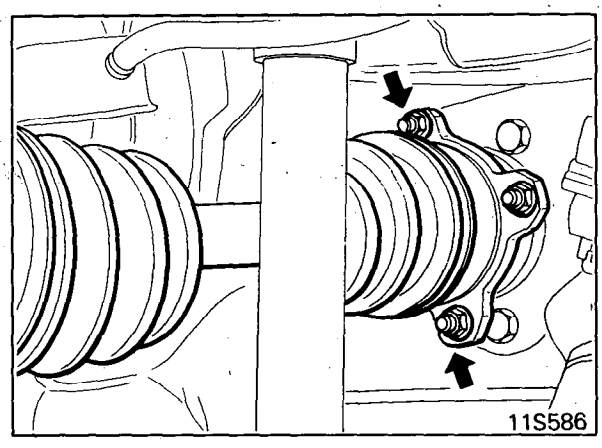
REMOVAL

1. Remove the front brake caliper assembly. Do not disconnect the brake hose. (Refer to p. 2-27.)
2. Remove the free-wheeling hub cover or hub cap.
3. Remove the snap ring from the drive shaft. (Refer to p. 2-32.)
4. Remove the knuckle together with the front hub assembly. (Refer to p. 2-25.)
5. Remove the drive shaft as follows:
   FOR LEFT DRIVE SHAFT
   (1) Pull the drive shaft out of the differential carrier. (11S585)



Caution
When pulling the drive shaft out of the differential carrier, be careful that the spline part of the drive shaft does not damage the oil seal.

FOR RIGHT DRIVE SHAFT
(1) Detach the drive shaft from the differential carrier inner shaft.
(2) Remove the drive shaft. (11S586)

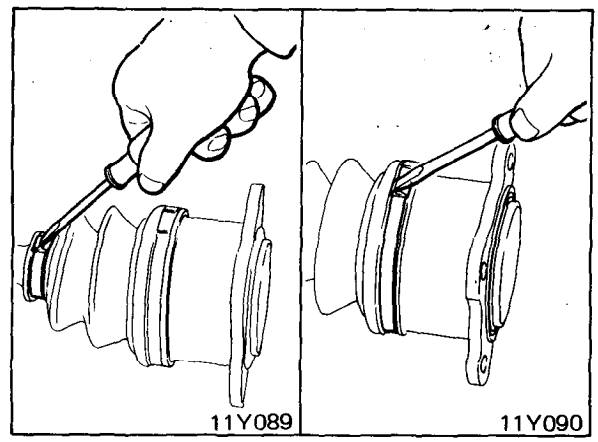


INSPECTION

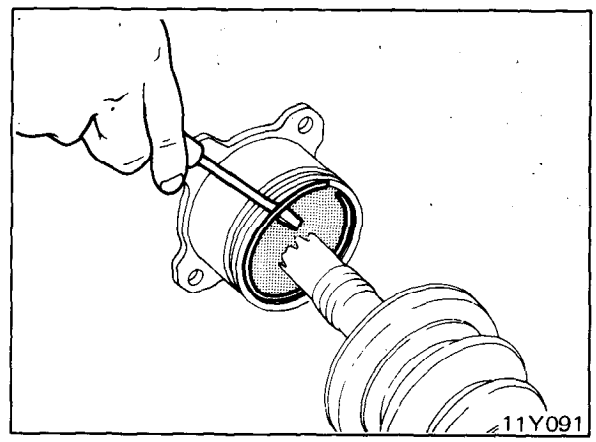
1. Check boot for damage or deterioration.
2. Check ball joint for operating condition and excessive looseness.
3. Check splines for wear or damage.

DISASSEMBLY

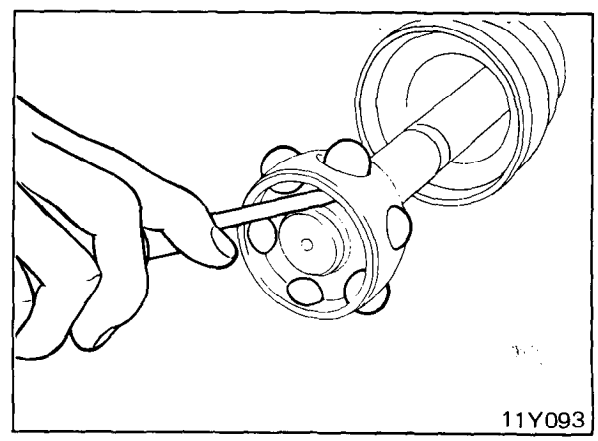
1. Remove the boot bands.



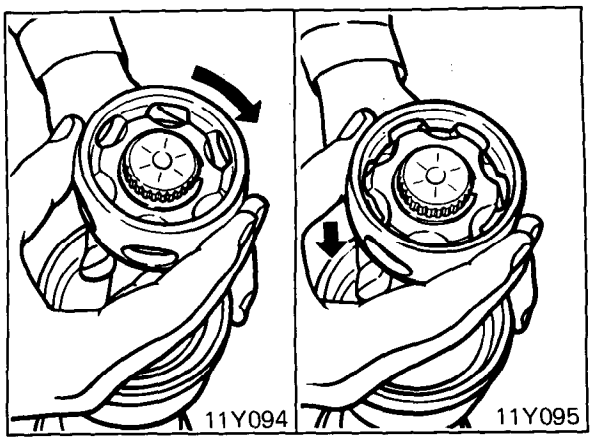
2. Remove the circlip from the D.O.J. outer race. Separate the drive shaft from the D.O.J. outer race.



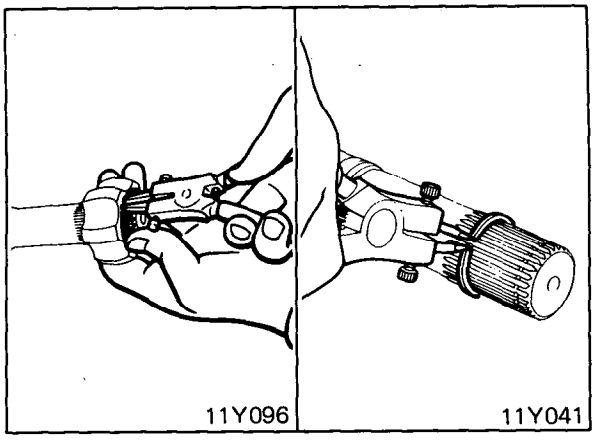
3. Remove the balls from the D.O.J. cage.



4. Remove the D.O.J. cage from the D.O.J. inner race in the direction of the B.J.

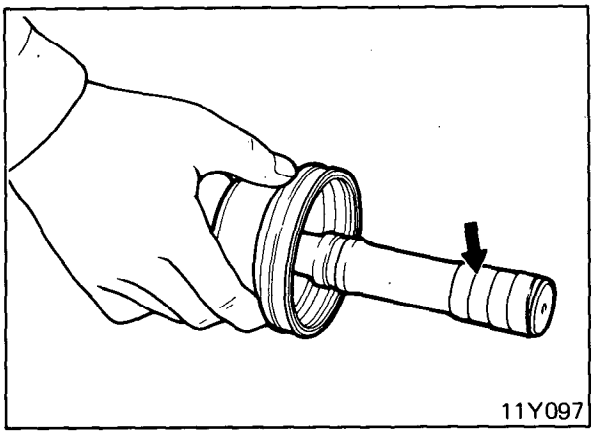


5. Remove the snap ring from the drive shaft with snap ring pliers, and then remove the D.O.J. inner race and D.O.J. cage from the drive shaft. Remove the circlip from the drive shaft with snap ring pliers.

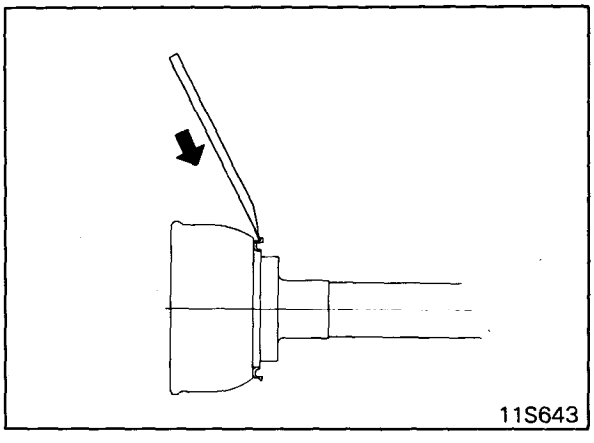


6. Wrap vinyl tape around the spline on the D.O.J. side of the drive shaft so that the D.O.J. and B.J. boots are not damaged when they are removed. (11Y097)
7. Remove the D.O.J. and B.J. boots from the drive shaft.

Caution
Do not disassemble the B.J.



8. Remove the dust cover from the B.J.



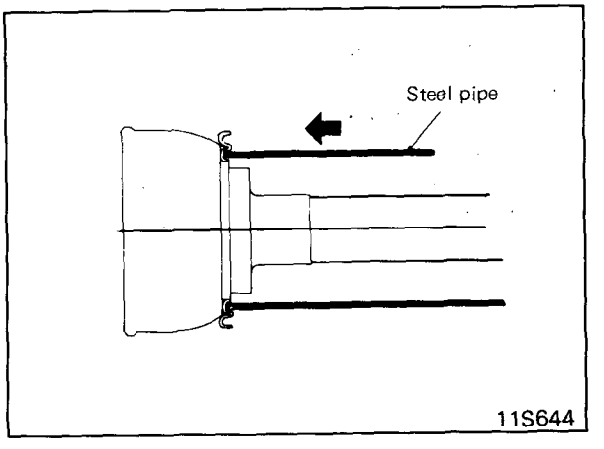
INSPECTION

1. Check drive shaft for bending or wear.
2. Check B.J. for entry of water, foreign matter and rust.
3. Check B.J. ball for damage.
4. Check D.O.J. cage, D.O.J. inner race and ball for rust, wear and damage.
5. Check the circlip for damage or deformation.
6. Check D.O.J. outer race for wear or damage.

REASSEMBLY

1. Using the steel pipe as specified below, force the dust cover to the drive shaft.

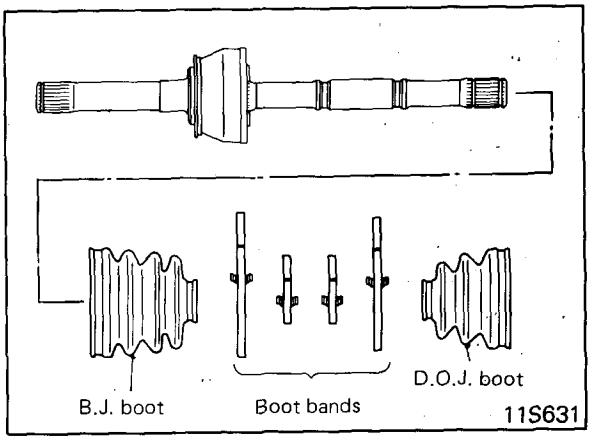
Steel Pipe	mm (in.)
Overall length	170 (6.70)
Outside diameter	68.9 (2.71)
Wall thickness	2.3 (.09)



2. Apply the specified grease to the drive shaft, and wrap vinyl tape around the spline on the D.O.J. side of the drive shaft.

Recommended grease ..... Repair kit grease

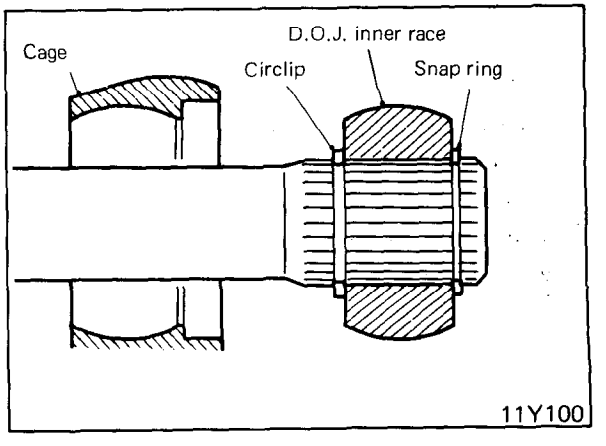
3. Install the B.J. boot, boot bands (new ones), and D.O.J. boot onto the drive shaft, in that order. (11S631)



Caution
The B.J. and D.O.J. boots are different in size and shape, so be sure to install them correctly.
The identification stamp mark on boot band A is "20-11 #B.J.95", and that on boot band B is "20-20 #B.J.95"; do not confuse these bands during assembly.

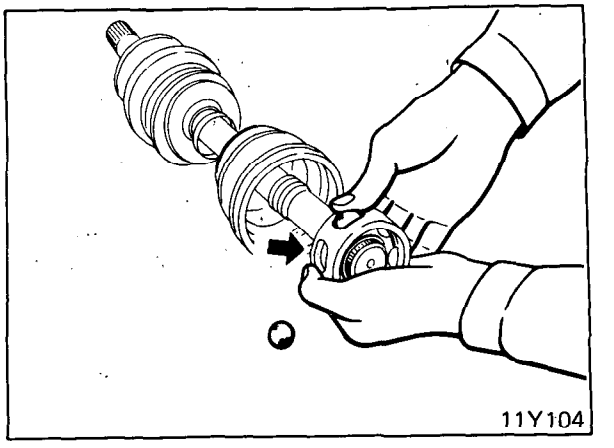
4. Install the D.O.J. cage onto the drive shaft so that the smaller diameter side of the cage is installed first. (11Y100)
5. Install the circlip onto the drive shaft.
6. Install the D.O.J. inner race onto the drive shaft, and secure it with a snap ring.
7. Apply the specified grease to the D.O.J. inner race and the D.O.J. cage, and then fit them together.

Recommended grease ..... Repair kit grease



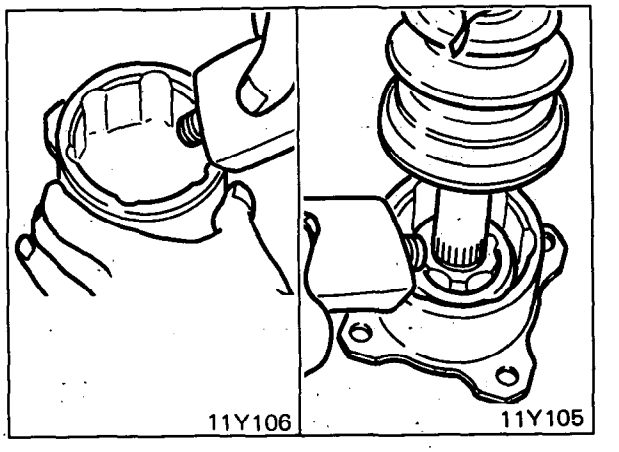
8. Apply the specified grease to the ball insertion parts of the D.O.J. inner race and D.O.J. cage, and then insert the balls.

Recommended grease	Repair kit grease



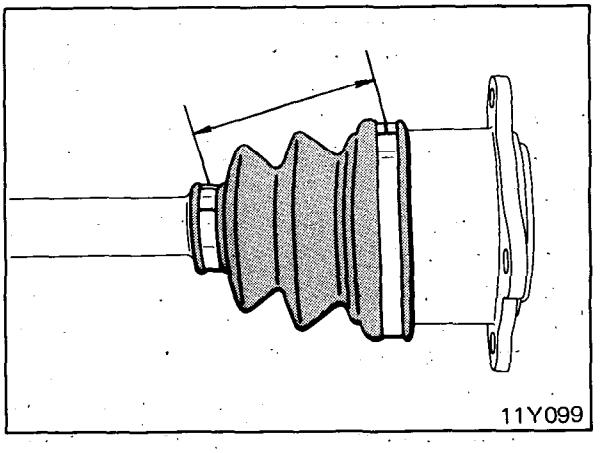
9. Apply 50 to 80 gr (1.8 to 2.8 oz) of the specified grease to the D.O.J. outer race. (11Y106)
10. Install the drive shaft into the D.O.J. outer race, and then apply 50 to 70 gr (1.8 to 2.5 oz) of the specified grease to the race. (11Y105)

Recommended grease	Repair kit grease



11. Install the circlip onto the D.O.J. outer race.
12. Place the D.O.J. boot over the D.O.J. outer race, and then use boot band B to secure the boot.
13. Place boot band C at the specified distance in order to adjust the amount of air inside the D.O.J. boot, and then tighten boot band C. (11Y099)

Setting of D.O.J. boot length	79 mm (3.1 in.)



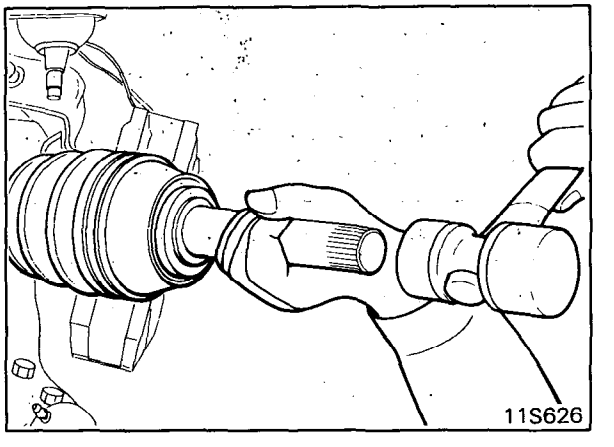
14. If the B.J. is to be reused, pack 100 to 150 gr (3.5 to 5.3 oz) of the specified grease into the B.J. boot, and then secure the boot with the boot band.

Recommended grease	Repair kit grease

INSTALLATION

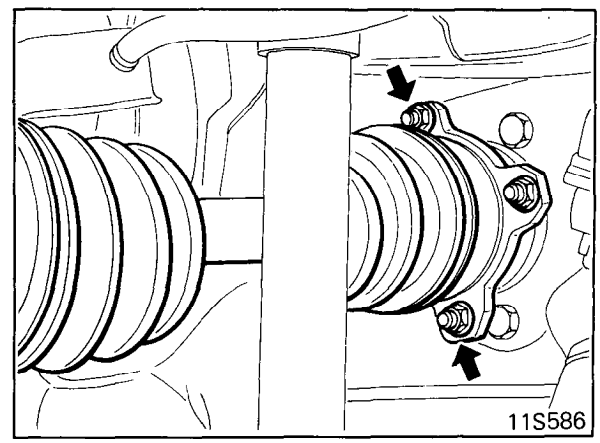
1. Drive the left drive shaft into the front differential carrier with a plastic hammer.

Caution
Be careful not to damage the lip of the oil seal.
Replace the circlip on the spline on the B.J. side with a new one.



2. Connect the right drive shaft to the inner shaft, and then tighten to the specified torque. (11S586)

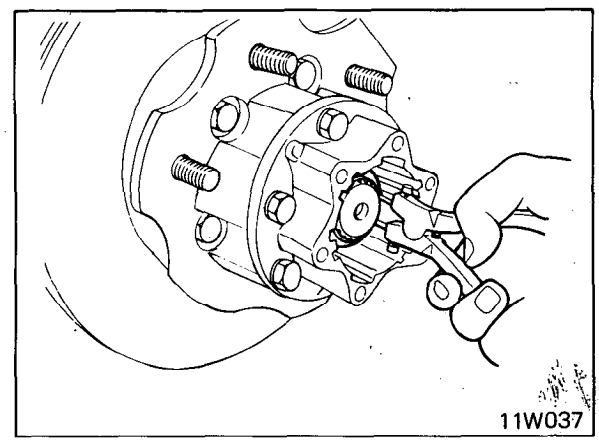
Right drive shaft to inner shaft	50-60 Nm (36-43 ft.lbs.)



3. Install the knuckle together with the front hub assembly. (Refer to p. 2-26.)

4. Adjust the drive shaft end play as follows:

Drive shaft end play	0.2-0.5 mm (.008-.020 in.)

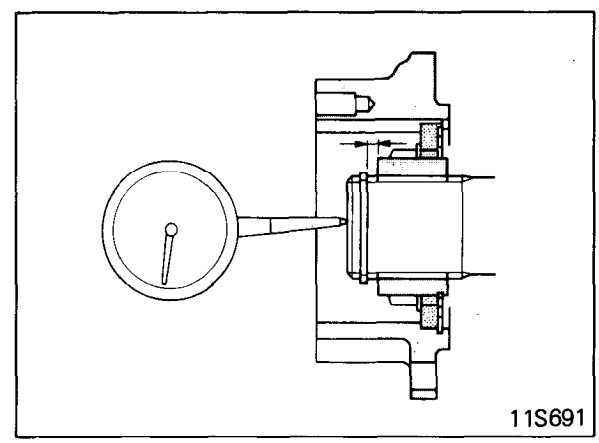


(1) Remove the free-wheeling hub cover.
(2) Remove the snap ring of the drive shaft and then remove the spacer. (11W037)
(3) Mount the snap ring onto the drive shaft.

NOTE
Do not install a spacer.

(4) Move the drive shaft in the axial direction and measure the play.

NOTE
To measure the play, use a dial indicator.
(Refer to p. 2-12.) (11S691)



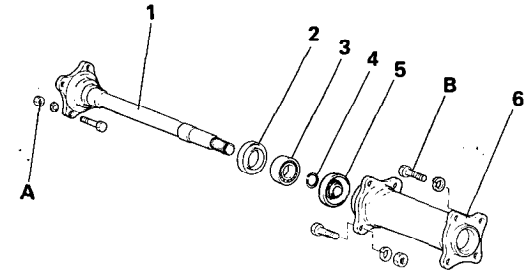
(5) Select a spacer so that the measured value will be within specifications, and then install it onto the drive shaft.
(6) Install the snap ring.
(7) Install the free-wheeling hub cover.

5. Torque all parts to specifications during assembly.

COMPONENTS

1. Inner shaft
2. Dust cover
3. Bearing
4. Circlip
5. Dust seal
6. Housing tube

	Nm	ft.lbs.
A	50-60	36-43
B	80-100	58-72



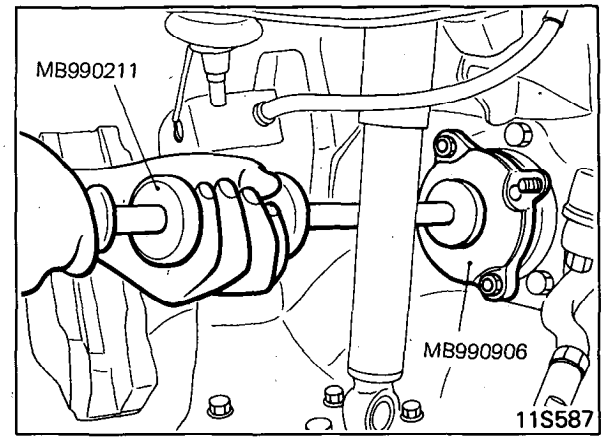
11S681

REMOVAL

1. Slightly raise the lower arm on a jack.
2. Remove the mounting nut from the top of the shock absorber and then detach the shock absorber from the crossmember.

Caution
When removing the shock absorber, do not lower the jack. Do not remove the jack until the top of the shock abosrber is reattached to the crossmember.

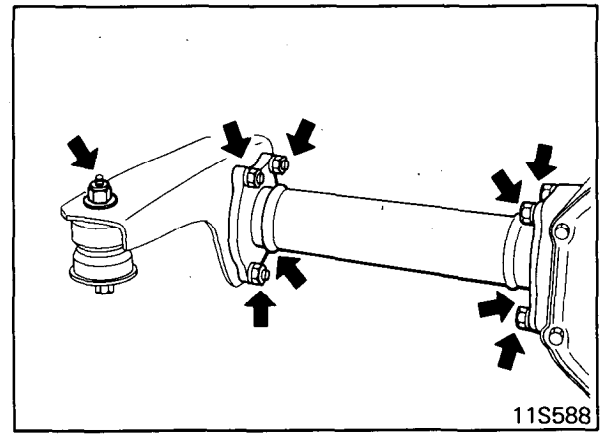
3. Remove the right drive shaft. (Refer to p. 2-42.) (11S587)



4. Attach the special tools to the shaft flange and pull the inner shaft from the front differential carrier. (11S587)

Caution
When pulling the inner shaft out of the front differential carrier, be careful that the spline part of the inner shaft does not damage the oil seal.

5. If necessary, remove the housing tube. (11S588)

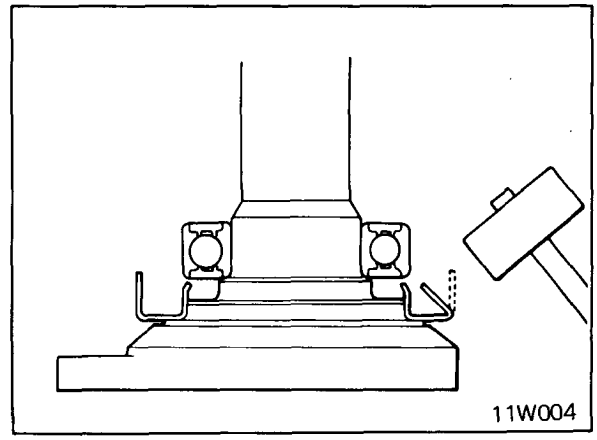


INSPECTION BEFORE DISASSEMBLY

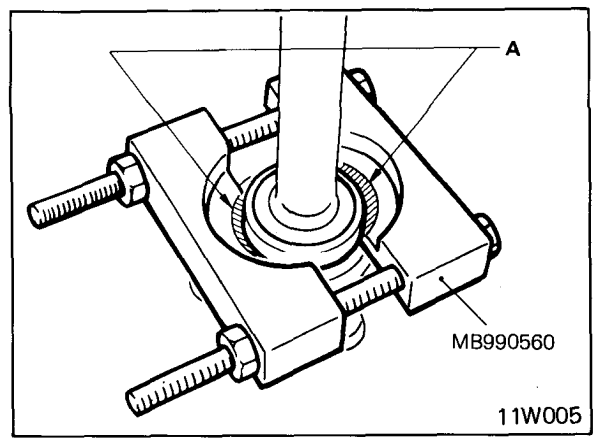
1. Check inner shaft for bend.
2. Check bearing for wear or discoloration.
3. Check housing tube for cracks.
4. Check dust seal for cracks or damage.

DISASSEMBLY

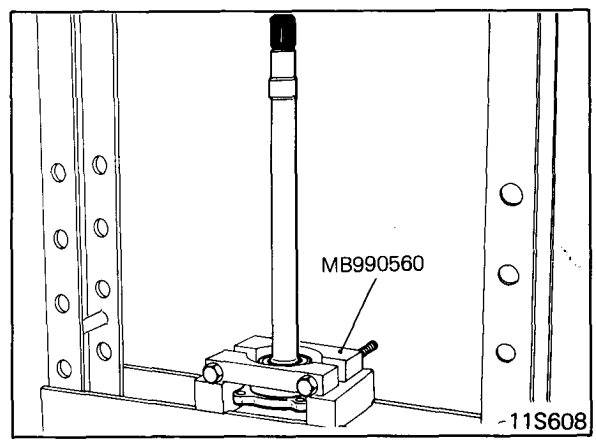
1. Bend the outside circumference of dust cover inward with a hammer.



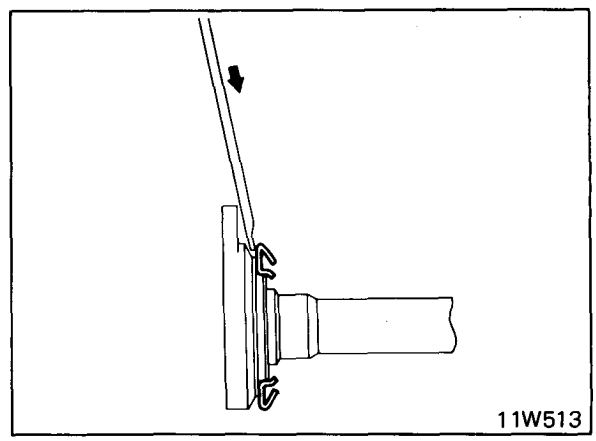
2. After a special tool has been mounted as shown, tighten the nut until part A contacts the bearing outer race.



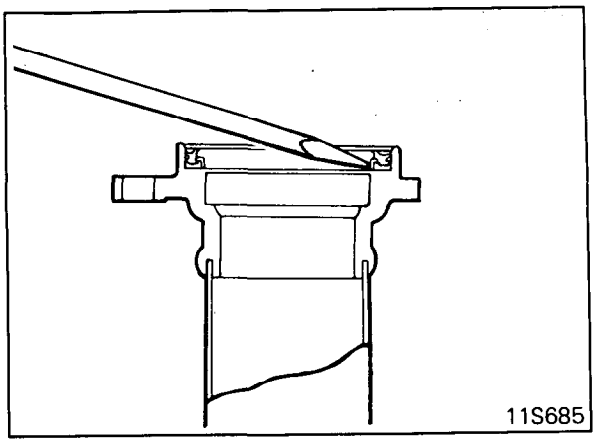
3. Remove the inner shaft from the bearing.



4. Remove the dust cover from the inner shaft.



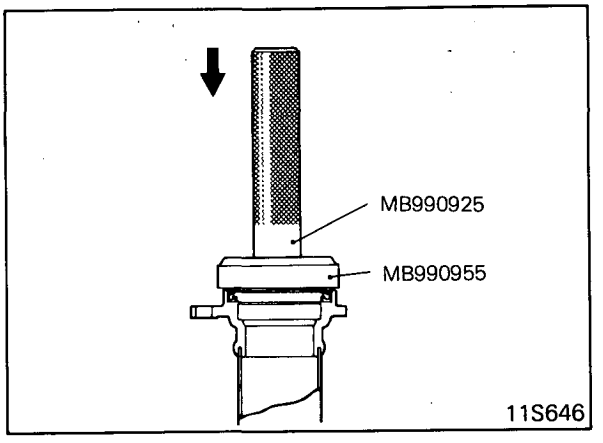
5. Remove the dust seal from the housing tube.



REASSEMBLY

1. Press the new dust seal into the housing tube with the special tools until it is flush with end of the housing tube. (11S646)
2. Apply the specified grease to the dust seal lip.

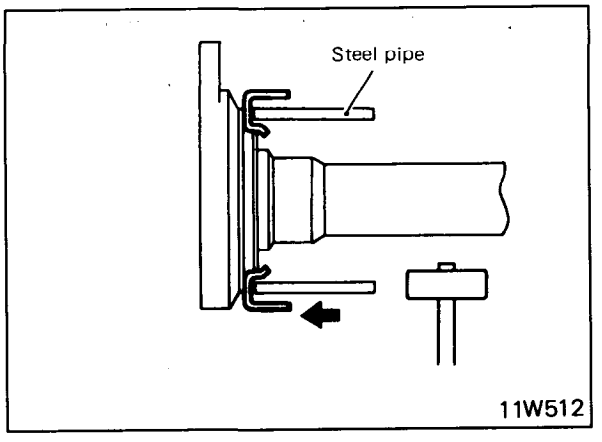
Recommended multipurpose grease	SAE J310a, NLGI grade #2EP



Caution
When installing the inner shaft, be careful that the bearing outer race does not damage the lip of the dust seal.

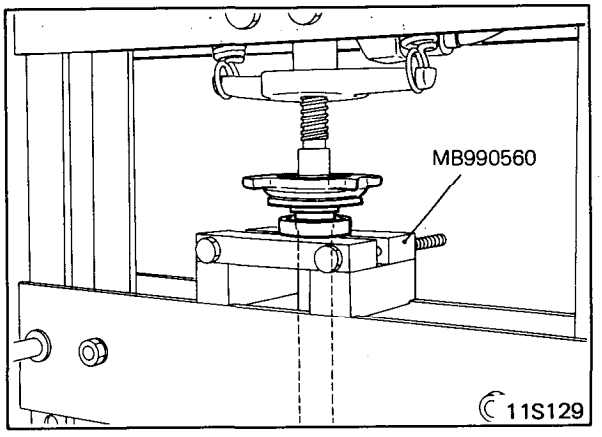
3. Using the steel pipe described below, force a new dust cover onto the inner shaft.

Steel Pipe	mm (in.)
Overall length	50 (1.7)
Outside diameter	75 (3.0)
Wall thickness	4 (.2)



NOTE
After the dust cover has been installed, apply the specified grease to the bearing mounting surface of the dust cover.

4. Using a special tool, force the bearing onto the inner shaft.



INSTALLATION

1. Install the housing tube onto the front differential carrier and differential mounting bracket.
2. Drive the inner shaft into the front differential carrier with the special tool (MB990906).

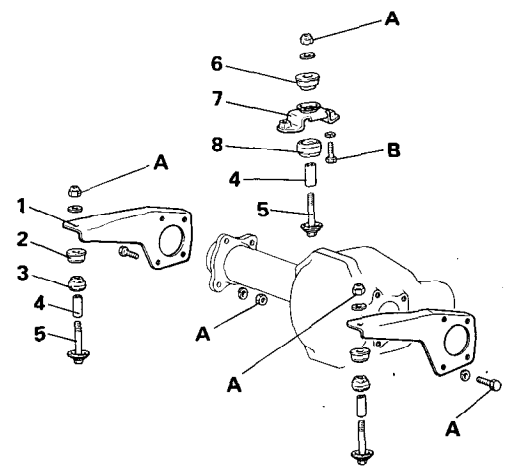
Caution
Replace the circlip on the spline part of the inner shaft with a new one.
Be careful not to damage the lip of the dust seal on the oil seal.

3. Install the right drive shaft. (Refer to p. 2-46.)
4. Torque all parts to specifications during assembly.

DIFFERENTIAL MOUNTING

COMPONENTS

1. Differential mounting bracket
2. Differential mounting rubber A
3. Differential mounting rubber B
4. Spacer
5. Pin
6. Differential mounting rubber C
7. Bracket
8. Differential mounting rubber D

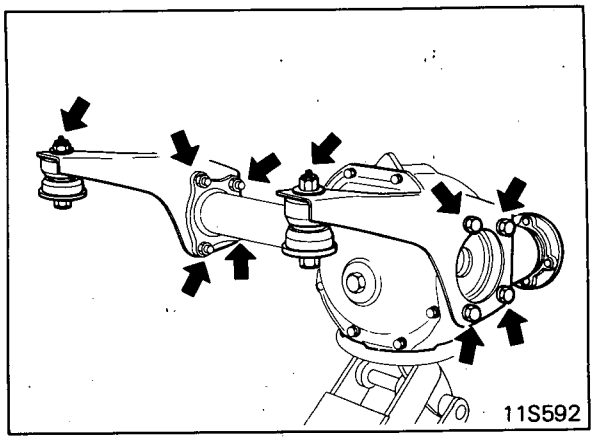


	Nm	ft. lbs.
A	80-100	58-72
B	30-42	22-30

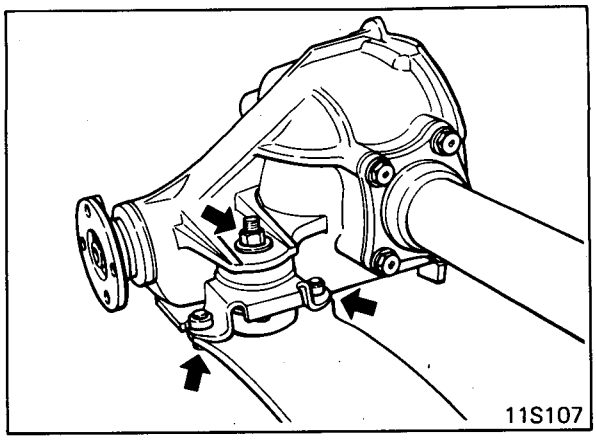
11S130

REMOVAL

1. Remove the drive shafts. (Refer to p. 2-42.)
2. Remove the inner shaft. (Refer to p. 2-48.)
3. Support the differential carrier with a jack.
4. Remove the right and left differential mounting brackets. (11S592)



5. Support the differential carrier with a jack.
6. Remove the bracket from the differential carrier and front suspension crossmember. (11S107)



INSPECTION

1. Check differential mounting bracket for deformation and damage.
2. Check bracket for deformation and damage.
3. Check differential mounting rubber for cracks and damage.

INSTALLATION

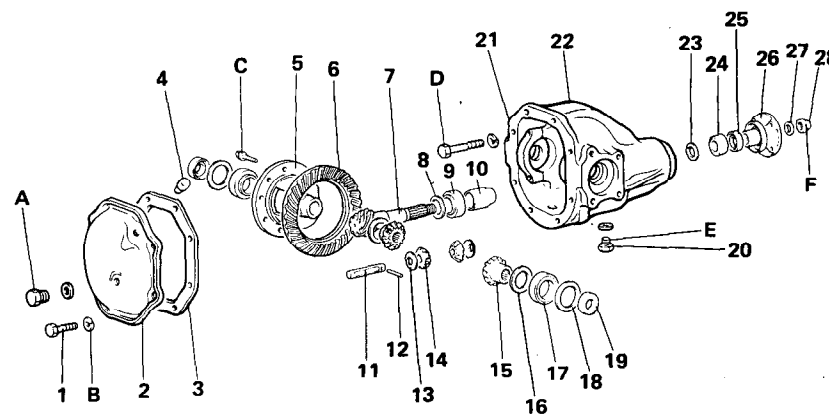
1. Install the right and left differential mounting brackets and the rear side bracket by tightening the self-locking nuts to the specified torque.

Differential mounting bracket tightening torque. . .
80-100 Nm (58-72 ft.lbs.)

2. Torque all parts to specifications during assembly.

COMPONENTS

1. Filler plug
2. Cover
3. Gasket
4. Vent plug
5. Differential case
6. Ring gear
7. Drive pinion
8. Drive pinion front shim (for pinion height adjustment)
9. Drive pinion front bearing
10. Drive pinion spacer
11. Pinion shaft
12. Lock pin
13. Pinion washer
14. Pinion gear
15. Side gear
16. Side gear thrust spacer
17. Side bearing
18. Side bearing adjusting spacer
19. Oil seal
20. Drain plug
21. Bearing cap
22. Gear carrier
23. Drive pinion rear shim (for preload adjustment)
24. Drive pinion rear bearing
25. Oil seal
26. Companion flange
27. Washer
28. Self-locking nut



	Nm	ft. lbs.
A	40-60	29-43
B	15-22	11-16
C	80-90	58-65
D	55-65	40-47
E	60-70	43-51
F	160-220	116-159

11S058

REMOVAL

1. Remove the drain plug to drain the differential gear oil.
2. Remove the drive shafts. (Refer to p. 2-42.)
3. Remove the inner shaft. (Refer to p. 2-48.)
4. Detach the propeller shaft from the differential carrier. (Refer to GROUP 16.)
5. Remove the left differential mounting bracket. (Refer to p. 2-52.)
6. Detach the right differential mounting bracket from the frame. (Refer to p. 2-52.)

7. Detach the front suspension crossmember from the frame, and then remove the differential carrier together with the front suspension crossmember.
(Refer to p. 2-52.)
8. Secure the working base in a vice and mount the differential carrier onto the working base.

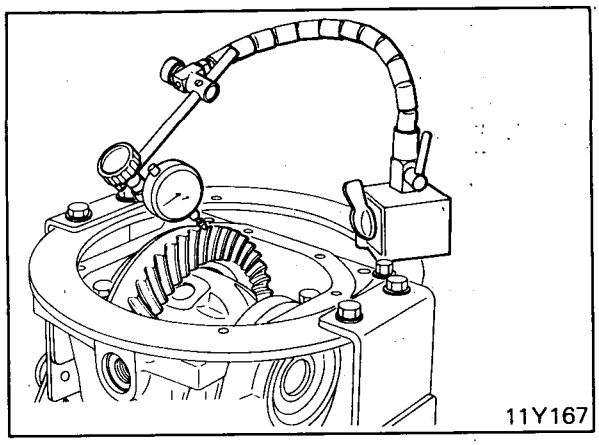
INSPECTION BEFORE DISASSEMBLY

NOTE
For the differential carrier inspection procedure, refer to GROUP 3.

Final Ring Gear Backlash

With the drive pinion locked in place, measure the final ring gear backlash with a dial indicator. (11Y167)

Final ring gear backlash .....
0.13-0.18 mm (.005-.007 in.)

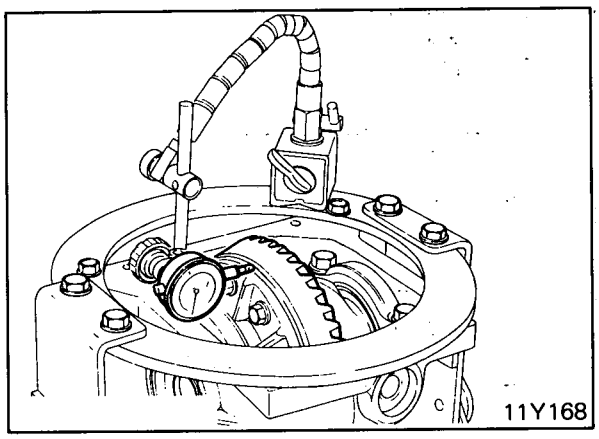

11Y167

NOTE
Measure at four different points on the circumference of the ring gear.

Ring Gear Runout

Measure the ring gear runout at the shoulder on the reverse side of the gear teeth. (11Y168)

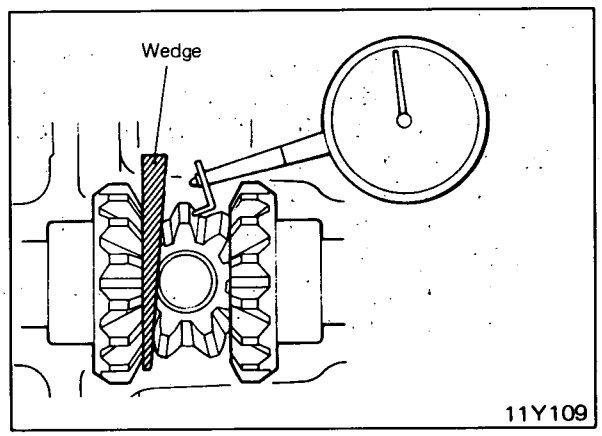
Ring gear runout [Repair limit] .....
0.05 mm (.002 in.)


11Y168

Differential Gear Backlash

Lock the side gear with a wedge and measure the differential gear backlash with a dial indicator positioned on the pinion gear. (11Y109)

Differential gear backlash [Repair limit] .....
0.15 mm (.006 in.)



11Y109

Final Ring Gear Tooth Contact

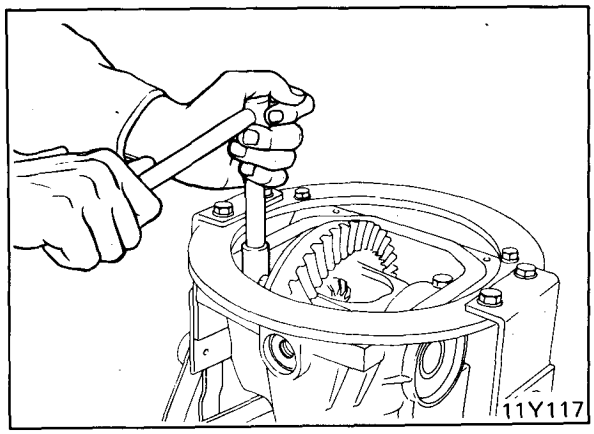
Check the tooth contact of the final ring gear tooth contact.

DISASSEMBLY

Differential Case Assembly

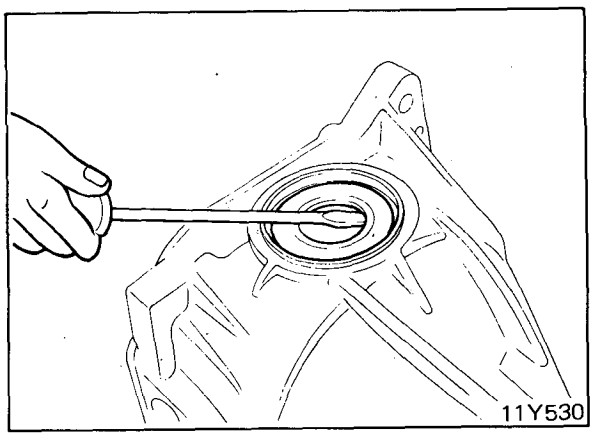
1. Remove the bearing caps. (11Y117)
2. For the procedure from removal of the differential case to removal of the differential gears, refer to GROUP 3.

NOTE
When reference is made to GROUP 3 as mentioned above, the "Side bearing nut" in GROUP 3 should be interpreted as the "Side bearing adjusting spacer".



3. Remove the oil seal for the drive shaft or the inner shaft.

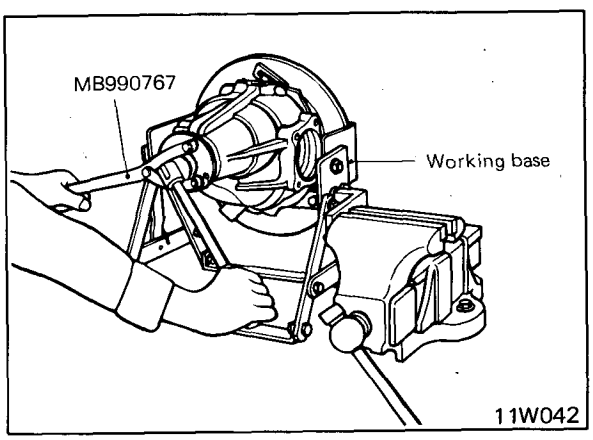
NOTE
The oil seal for the drive shaft or the inner shaft can also be replaced by pulling out the drive shaft or the inner shaft, without removing the differential carrier from the vehicle. (Refer to p. 2-42.) (11Y530)



Drive Pinion

1. For the drive pinion disassembly procedure, refer to GROUP 3.

NOTE
The names used for the special tools in GROUP 3 differ from those used here, and also the following parts should be interpreted as indicated below:
(11W042)
Drive pinion front shim
→ Drive pinion rear shim
Drive pinion rear bearing
→ Drive pinion front bearing

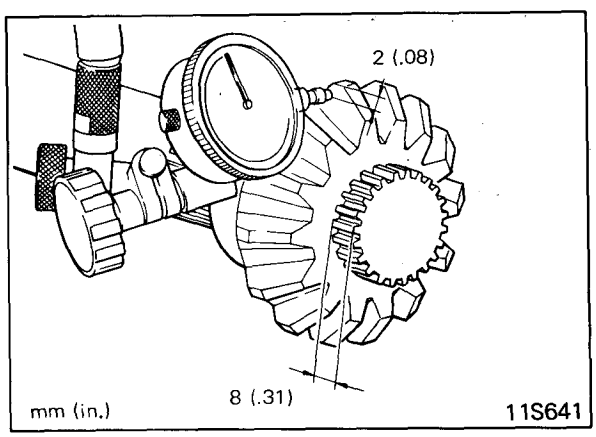


INSPECTION

1. Check spline coupling for wear and damage.
2. Check oil seal for wear and deterioration.
3. Check bearings for wear and discoloration.
4. Check gear carrier for cracks.
5. Check drive pinion and ring gear for wear and cracks.
6. Check side gear, pinion gear and pinion shaft for wear and seizure.

Checking of the Drive Shaft Spline for Looseness

With the drive shaft secured in a vice, measure the free play with a dial indicator. (11S641)

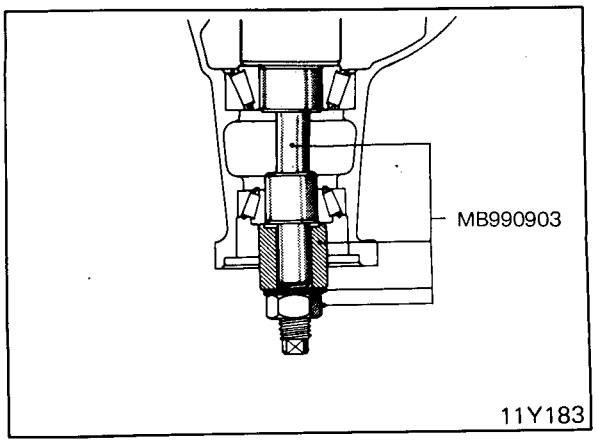


REASSEMBLY

Drive Pinion

For the drive pinion reassembly procedure, refer to GROUP 3.

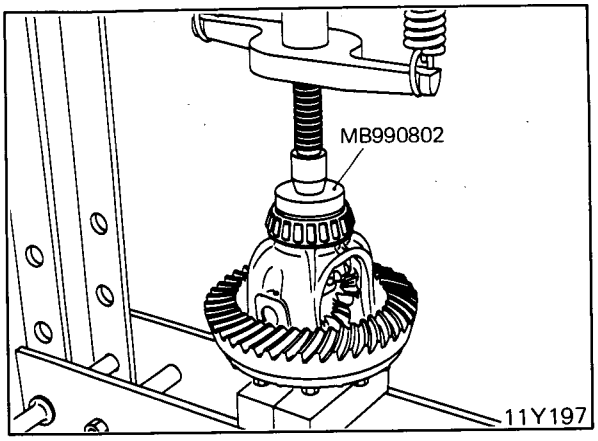
NOTE
The names used for the special tools in GROUP 3 differ from those used here, and also the following parts should be interpreted as indicated below:
(11Y183)
Drive pinion front shim
→ Drive pinion rear shim
Drive pinion front bearing
→ Drive pinion rear bearing



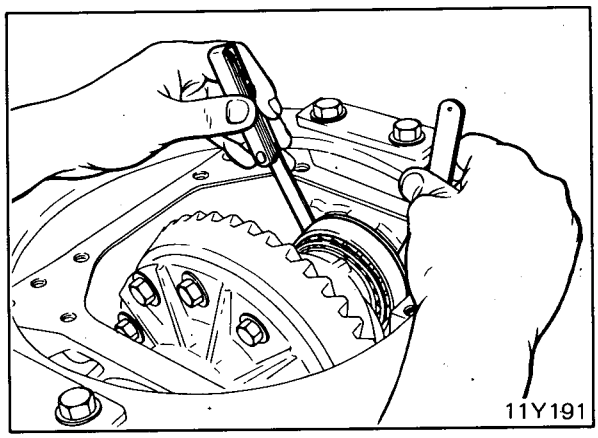
Differential Case Assembly

1. For the differential case reassembly procedure except for the final ring gear backlash adjustment procedure, refer to GROUP 3.
2. Adjust the final ring gear backlash as follows:
   (1) Press the side bearing inner races into the differential case with a special tool. (11Y197)
   (2) Install side bearing adjusting spacers which are thinner than those removed on both the pinion gear and the ring gear sides of the differential case assembly, and then fit the differential case assembly into the gear carrier.

   NOTE
   Select side bearing adjusting spacers with the same thickness for both the drive pinion side and the ring gear side.

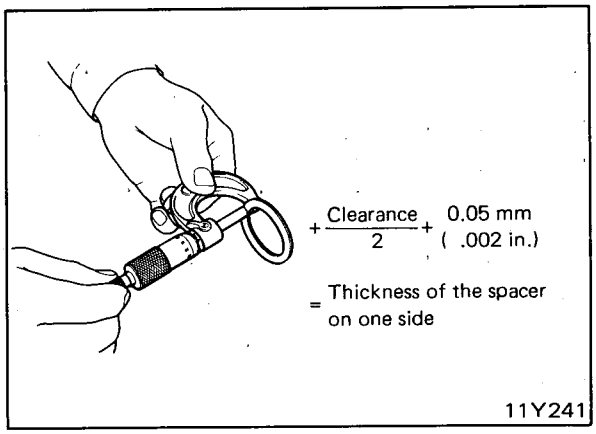


   (3) Push the differential case assembly to one side and measure the clearance between the gear carrier and the side bearing adjusting spacer with a feeler gauge. (11Y191)

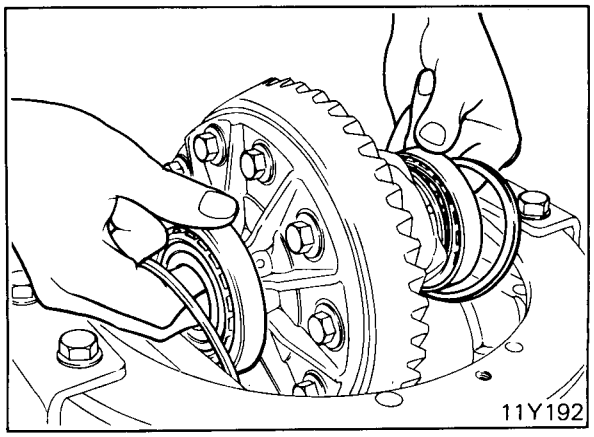


   (4) Measure the thickness of the side bearing adjusting spacers on one side, select two pairs of spacers which correspond to that thickness plus one half of the clearance plus 0.05 mm (.002 in.), and then install one pair each on the drive pinion side and the ring gear side. (11Y241)

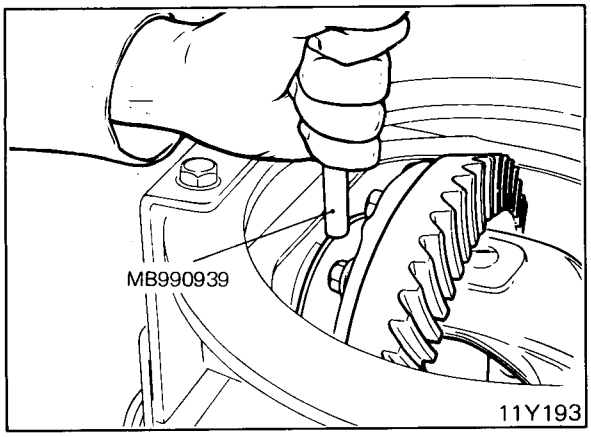
   NOTE
   Be sure that there is no clearance between the gear carrier and the side bearing adjusting spacer.



(5) Install the side bearing adjusting spacers and differential case assembly, on the gear carrier as shown in the illustration.

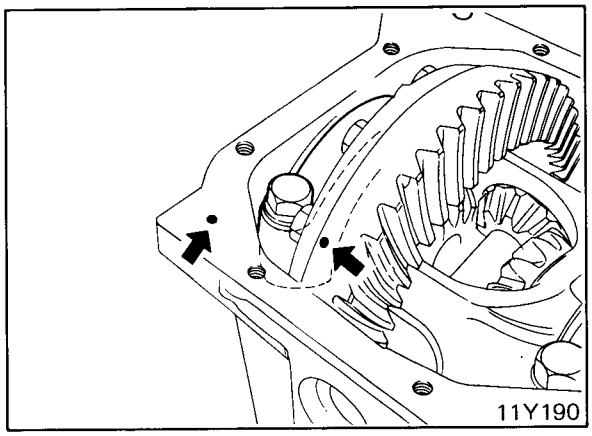


(6) Tap the side bearing adjusting spacers with a brass bar to fit them into the side bearing outer race.



(7) Align the mating marks on the gear carrier and the bearing cap, and then tighten the bearing cap. (11Y 190)

(8) Measure the final ring gear backlash. (Refer to GROUP 3.)



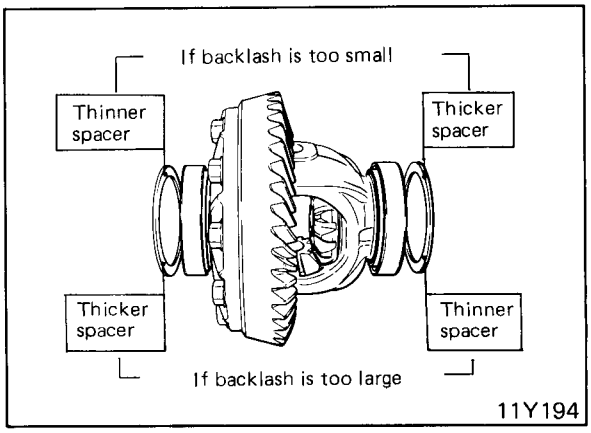
(9) Select the side bearing adjusting spacers as illustrated, and then adjust the final ring gear backlash between the ring gear and the drive pinion. (11Y194)

NOTE

Be sure to select the side bearing adjusting spacers on the drive pinion side and on the ring gear side so that the total thickness is equal to that obtained from the calculation in step (4).

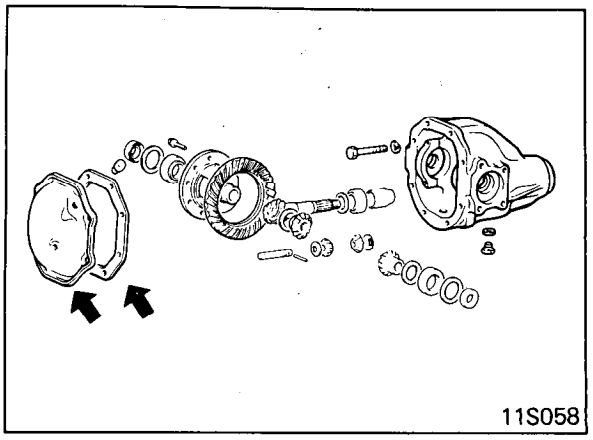
When selecting the side bearing adjusting spacers, keep the number of spacers to a minimum.

3. Torque all parts to specifications during assembly.



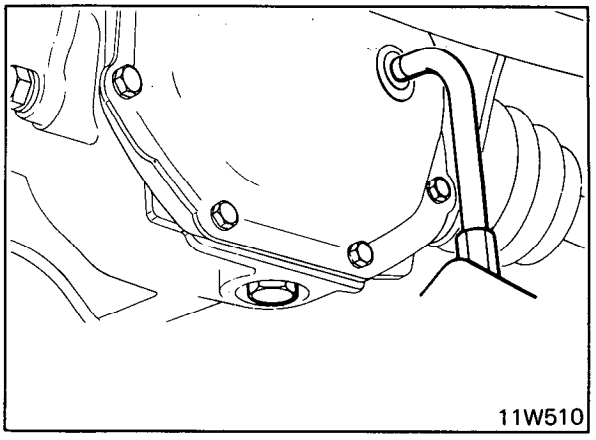
INSTALLATINON

1 Apply semi-drying sealant to both sides of the gasket and install the differential cover onto the differential carrier. (11S058)
2. Install the differential mounting. (Refer to p. 2-52.)
3. Install the propeller shaft. (Refer to GROUP 16.)
4. Torque all parts to specifications during assembly.


11S058

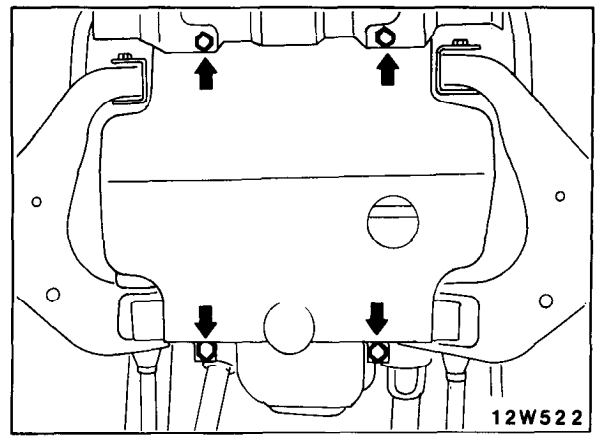
5. Supply the specified differential gear oil to the differential.

Recommended front axle gear oil	Hypoid gear oil API classification GL-4 or GL-5 SAE viscosity No. 90
	1.10 lit. (1.16 U.S. qt., 0.97 Imp.qt.)


11W510

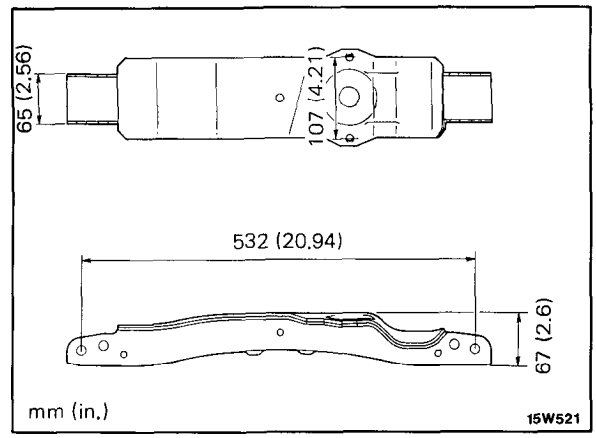
REMOVAL

1. Remove the under cover. (12W522)
2. Remove the front suspension crossmember.



INSPECTION

1. Check crossmember for incorrect alignment.
2. Check crossmember for cracks, bends and dents.



INSTALLATION

1. Install the front suspension crossmember, making sure that the direction of the bolts is correct. (15W519)
2. Torque all parts to specifications during assembly.