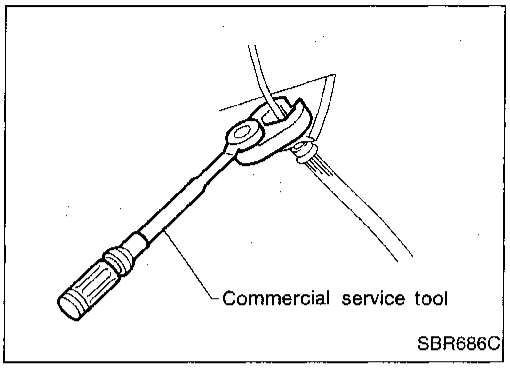
FRONT AXLE & FRONT SUSPENSION

SECTION FA

CONTENTS

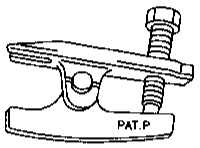
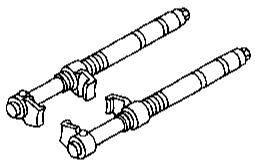
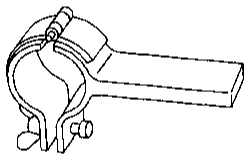
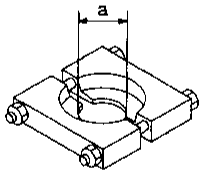


Precautions

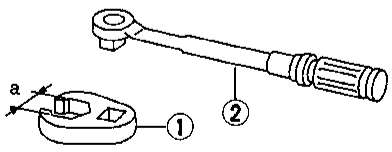
- **When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.**
  *** Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**
- **After installing removed suspension parts, check wheel alignment and adjust if necessary.**
- **Use flare nut wrench when removing or installing brake tubes.**
- **Always torque brake lines when installing.**

Special Service Tools

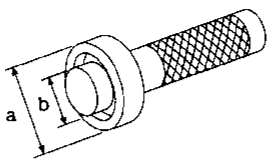
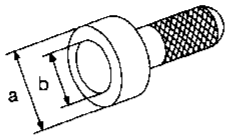
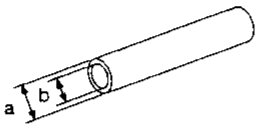
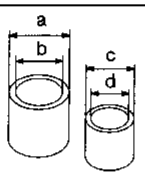
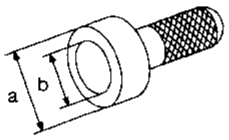
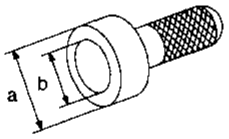
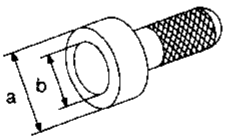
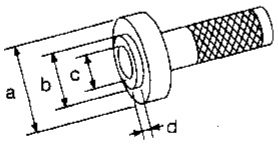
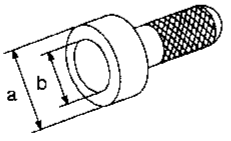
The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description	
HT72750000 (J24319-01) Ball joint remover	 NT146	Removing tie-rod outer end and lower ball joint
HT71780000 (—) Spring compressor	 NT144	Removing and installing coil spring
ST35652000 (—) Shock absorber attachment	 NT145	Fixing shock absorber
ST30031000 (J22912-01) Bearing inner race puller	 NT412	Removing bearing inner race **a: 50 mm (1.97 in) dia.**

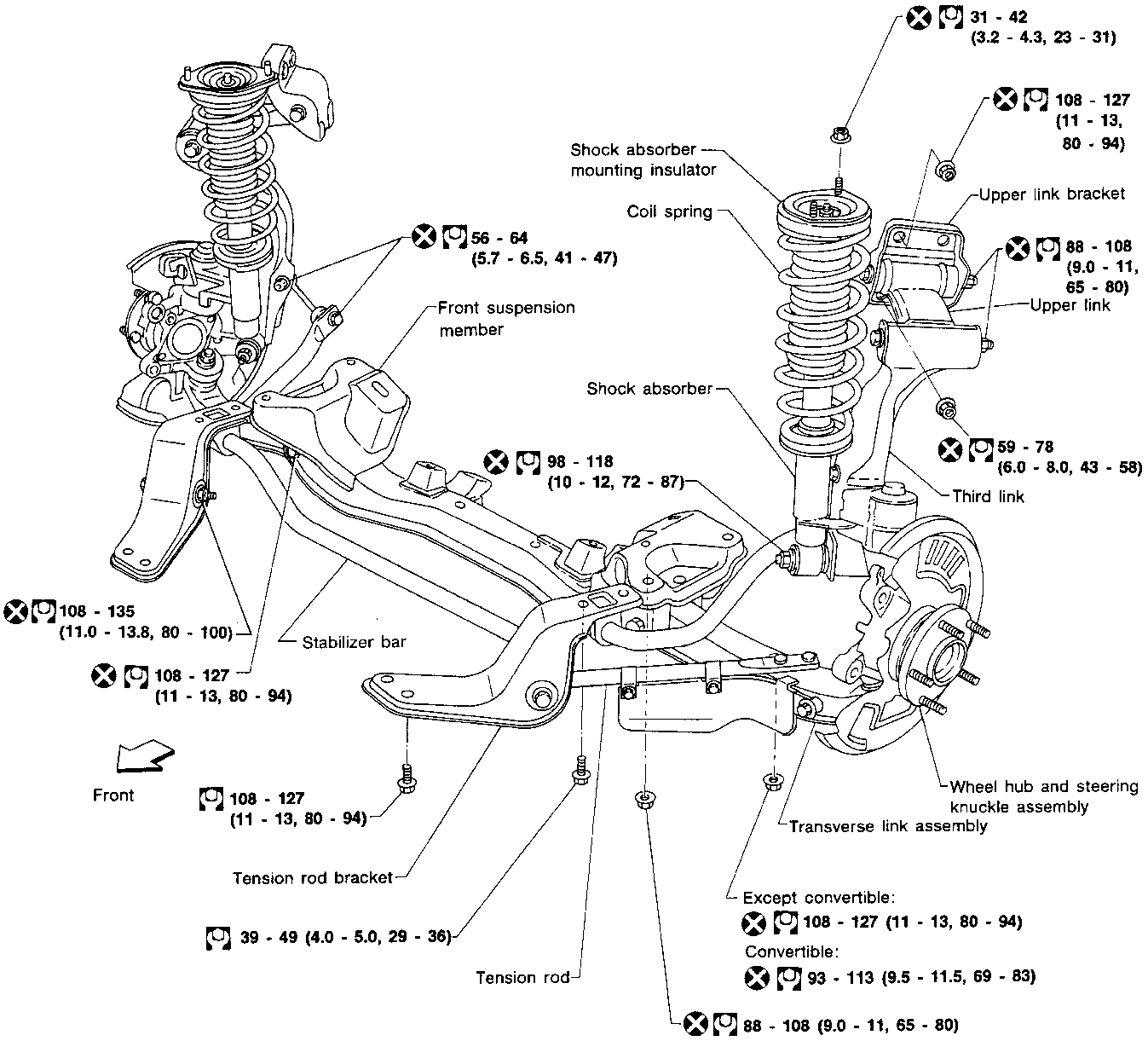
Commercial Service Tools

Tool name	Description	
① Flare nut crows foot ② Torque wrench	 NT360	Removing and installing each brake piping **a: 10 mm (0.39 in)**

Commercial Service Tools (Cont'd)

Tool name	Description	
Wheel bearing drift	 NT084	Removing wheel bearing **a: 60 mm (2.36 in) dia.** **b: 37 mm (1.46 in) dia.**
Wheel bearing drift	 NT115	Installing wheel bearing **a: 75 mm (2.95 in) dia.** **b: 65 mm (2.56 in) dia.**
Baffle plate drift	 NT065	Installing baffle plate **a: 125 mm (4.92 in) dia.** **b: 106 mm (4.17 in) dia.**
Tension rod bushing drift	 NT155	Removing and installing tension rod bushing **a: 78 mm (3.07 in) dia.** **b: 66 mm (2.60 in) dia.** **c: 62 mm (2.44 in) dia.** **d: 25 - 55 mm (0.98 - 2.17 in) dia.**
Grease seal drift	 NT115	Installing wheel hub grease seal **a: 86 mm (3.39 in) dia.** **b: 76 mm (2.99 in) dia.**
Cap drift	 NT115	Installing king pin cap **a: 60 mm (2.36 in) dia.** **b: 52 mm (2.05 in) dia.**
Bearing drift	 NT115	Installing king pin lower bearing **a: 57 mm (2.24 in) dia.** **b: 50 mm (1.97 in) dia.**
Bearing drift	 NT156	Installing king pin upper bearing **a: 57 mm (2.24 in) dia.** **b: 46 mm (1.81 in) dia.** **c: 40 mm (1.57 in) dia.** **d: 2.5 mm (0.098 in)**
Grease seal drift	 NT115	Installing king pin grease seal **a: 68 mm (2.68 in) dia.** **b: 58 mm (2.28 in) dia.**

SEC. 400•401

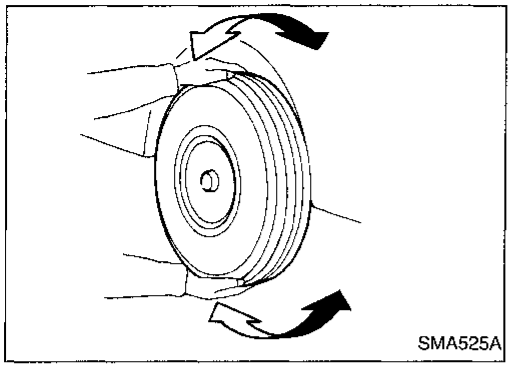


When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.

*** Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**

: N•m (kg-m, ft-lb)

SFA250BC

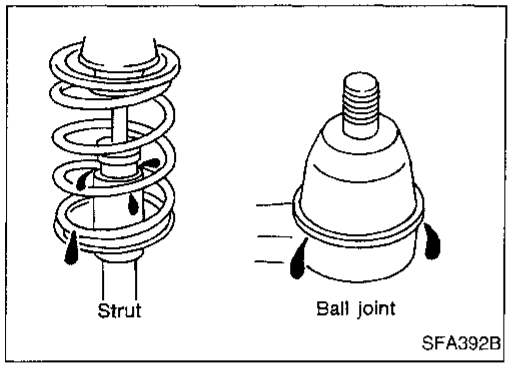

SMA525A

Front Axle and Front Suspension Parts

Check front axle and front suspension parts for excessive play, cracks, wear or other damage.

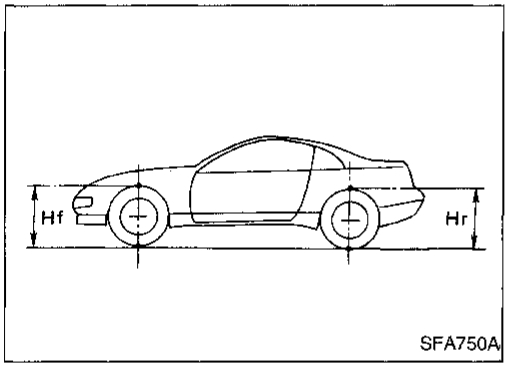
- Shake each front wheel to check for excessive play.
- Make sure that cotter pin is inserted.
- Retighten all nuts and bolts to the specified torque.

Tightening torque:
Refer to FRONT SUSPENSION (FA-14).



SFA392B

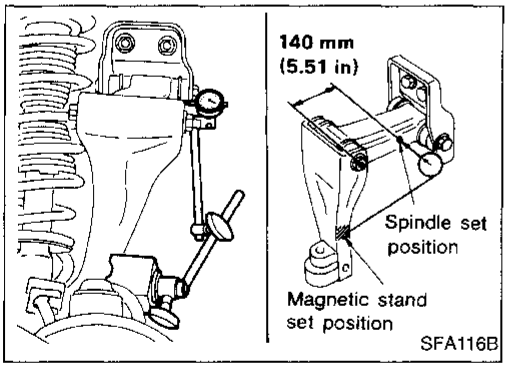
- Check shock absorber for oil leakage or other damage.
- Check suspension ball joint for grease leakage and ball joint dust cover for cracks or other damage.
  If ball joint dust cover is cracked or damaged, replace transverse link.



SFA750A

- Check spring height from top of wheelarch to ground using the following procedure.

(1) Park vehicle on a level surface with vehicle unladen* .
*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.
(2) Check tires for proper inflation and wear (tread wear indicator must not be showing).
(3) Bounce vehicle up and down several times and measure dimensions Hf and Hr. Refer to SDS (FA-29).
Spring height is not adjustable. If out of specification, check for worn springs or suspension parts.



SFA116B

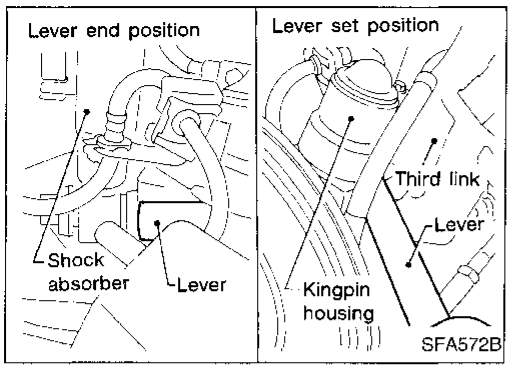
- Check upper link free play.

(1) Jack up front of vehicle and set stands.
(2) Set steering wheel in the straight-forward direction and lock it using key lock.
(3) Remove front wheels.

On axle side

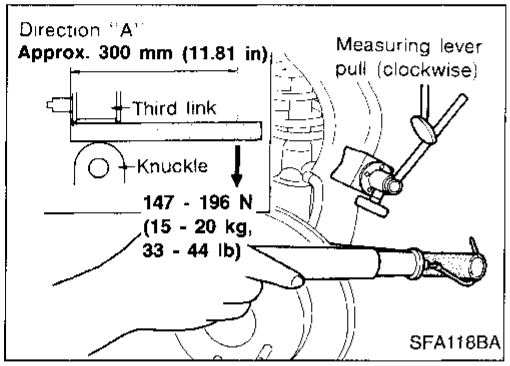
(4) Install dial gauge.
a. Install magnet stand on third link.
b. Set dial gauge in position.
Set dial gauge spindle in contact with flat surface of upper link.
Set at 140 mm (5.51 in) from center of upper link retaining bolt on the third link side.
(Reset dial gauge.)

Front Axle and Front Suspension Parts (Cont'd)



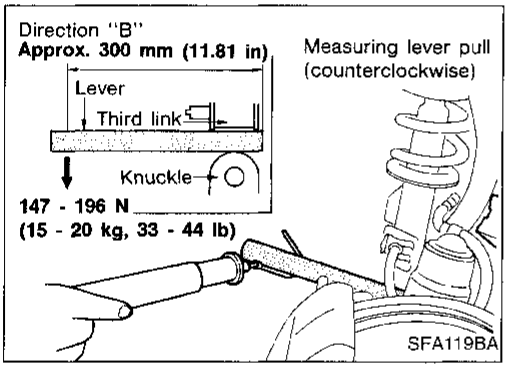
(5) Install lever.
Insert lever [30 mm (1.18 in) outside dia., 350 mm (13.78 in) long, approx.] between lower end of third link and kingpin location.

Make sure lever does not interfere with splash guard, brake hoses, etc., when set in position.



— Free play in direction "A" —

Attach spring scale to lever tip. Pull spring scale with a force of 147 to 196 N (15 to 20 kg, 33 to 44 lb) and then read dial gauge indication.

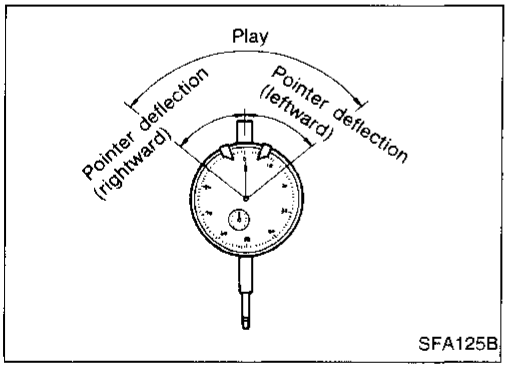


— Free play in direction "B" —

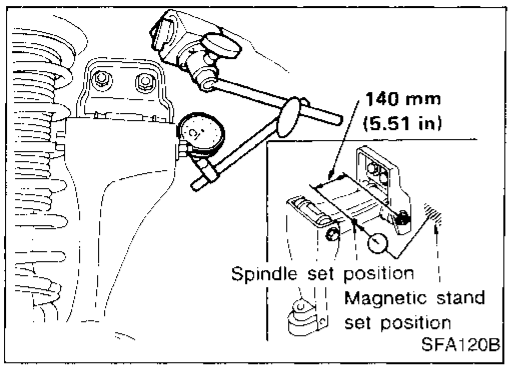
With dial gauge held in position, invert lever. Attach spring scale to lever tip. Pull spring scale with a force of 147 to 196 N (15 to 20 kg, 33 to 44 lb) and then read dial gauge indication.

Free play = (Gauge pointer deflection in direction "A") + (Gauge pointer deflection in direction "B")

Allowable free play range:
5.0 mm (0.197 in), max.

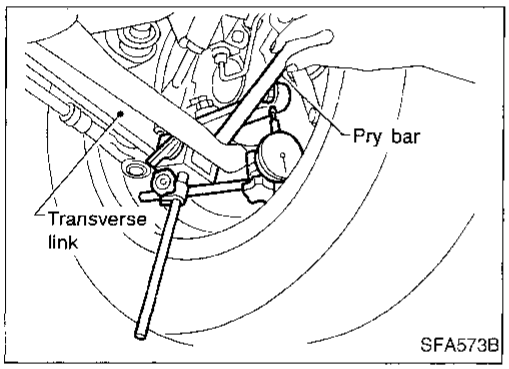


Front Axle and Front Suspension Parts (Cont'd)



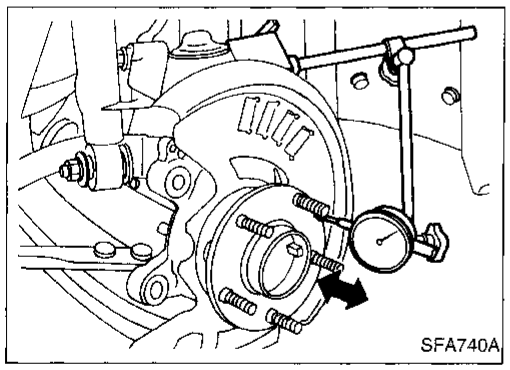
On body side

(6) Install dial gauge.
a. Install magnet stand on hoodledge wheelhouse side.
b. Set dial gauge in position.
Set dial gauge spindle in contact with flat surface of upper link.
Set at 140 mm (5.51 in) from center of upper link retaining bolt on bracket side. (Reset dial gauge.)
(7) Follow the same procedures for setting lever and measuring the free play as those outlined under "On axle side" above.
Allowable free play range:
5.0 mm (0.197 in), max.
(8) If free play exceeds specifications, replace upper link assembly.



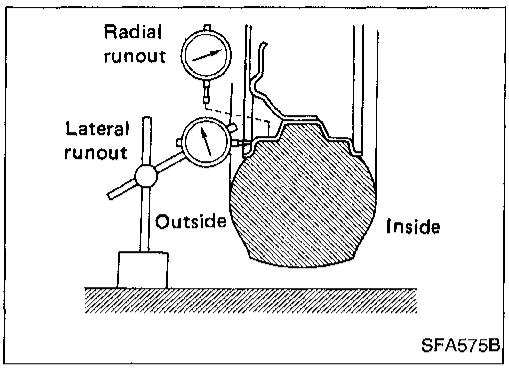
- Check suspension ball joint end play.

(1) Jack up front of vehicle and set the stands.
(2) Clamp dial indicator onto transverse link and place indicator tip on lower edge of brake caliper.
(3) Make sure front wheels are straight and brake pedal is depressed.
(4) Place a pry bar as shown in figure at left.
(5) While pushing and releasing pry bar, observe maximum dial indicator value.
Vertical end play: 0 mm (0 in)
If ball joint vertical end play exists, remove transverse link and recheck the ball joint. Refer to FA-18.



Front Wheel Bearing

- Check tightening torque of wheel bearing lock nut.
: 206 - 284 N·m
(21 - 29 kg-m, 152 - 210 ft-lb)
- Check that wheel bearings operate smoothly.
- Check axial end play.
Axial end play:
0.05 mm (0.0020 in) or less
- If out of specification or wheel bearing does not turn smoothly, replace wheel bearing assembly.
Refer to FRONT AXLE — Wheel Hub and Steering Knuckle (FA-10).



Front Wheel Alignment

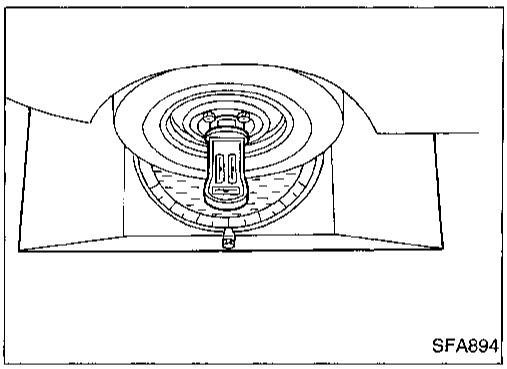
Before checking front wheel alignment, be sure to make a preliminary inspection (Unladen*).

*: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

PRELIMINARY INSPECTION

Make the following checks. Adjust, repair or replace if necessary.

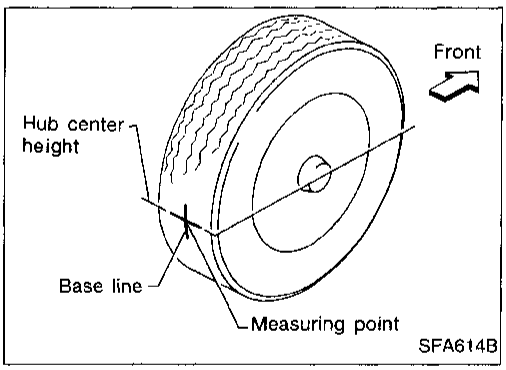
- Check tires for wear and improper inflation.
- Check front wheel bearings for looseness.
- Check wheel runout.
  Wheel runout:
  Refer to SDS (FA-29).
- Check front suspension for looseness.
- Check steering linkage for looseness.
- Check that front shock absorbers work properly.
- Check vehicle posture.



CAMBER, CASTER AND KINGPIN INCLINATION

Camber, caster and kingpin inclination are preset at factory and cannot be adjusted.

1. Measure camber, caster and kingpin inclination of both right and left wheels with a suitable alignment gauge.
   Camber, Caster and Kingpin inclination:
   Refer to SDS (FA-29).
2. If camber, caster or kingpin inclination is not within specification, inspect front suspension parts. Replace damaged or worn out parts.



TOE-IN

Measure toe-in using the following procedure.

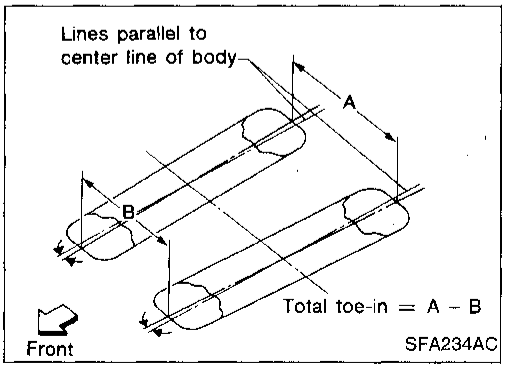
WARNING:

- **Always perform the following procedure on a flat surface.**
- **Make sure that no person is in front of the vehicle before pushing it.**

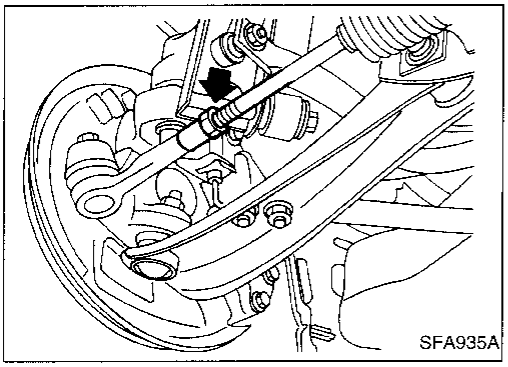
1. Bounce front of vehicle up and down to stabilize the posture.
2. Push the vehicle straight ahead about 5 m (16 ft).
3. Put a mark on base line of the tread (rear side) of both tires at the same height of hub center. This mark is a measuring point.
4. Measure distance "A" (rear side).
5. Push the vehicle slowly ahead to rotate the wheels 180 degrees (1/2 turn).

If the wheels have rotated more than 180 degrees (1/2 turn), try the above procedure again from the beginning. Never push vehicle backward.

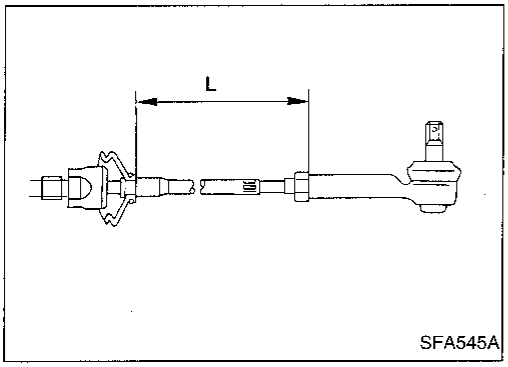
6. Measure distance "B" (front side).
   Total toe-in:
   Refer to SDS (FA-29).



Front Wheel Alignment (Cont'd)

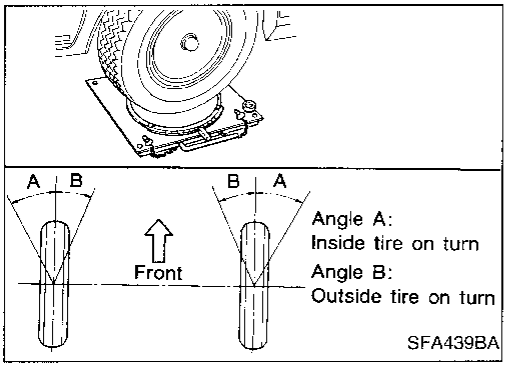


7. Adjust toe-in by varying the length of steering tie-rods.
(1) Loosen lock nuts.
(2) Adjust toe-in by screwing tie-rods in and out.



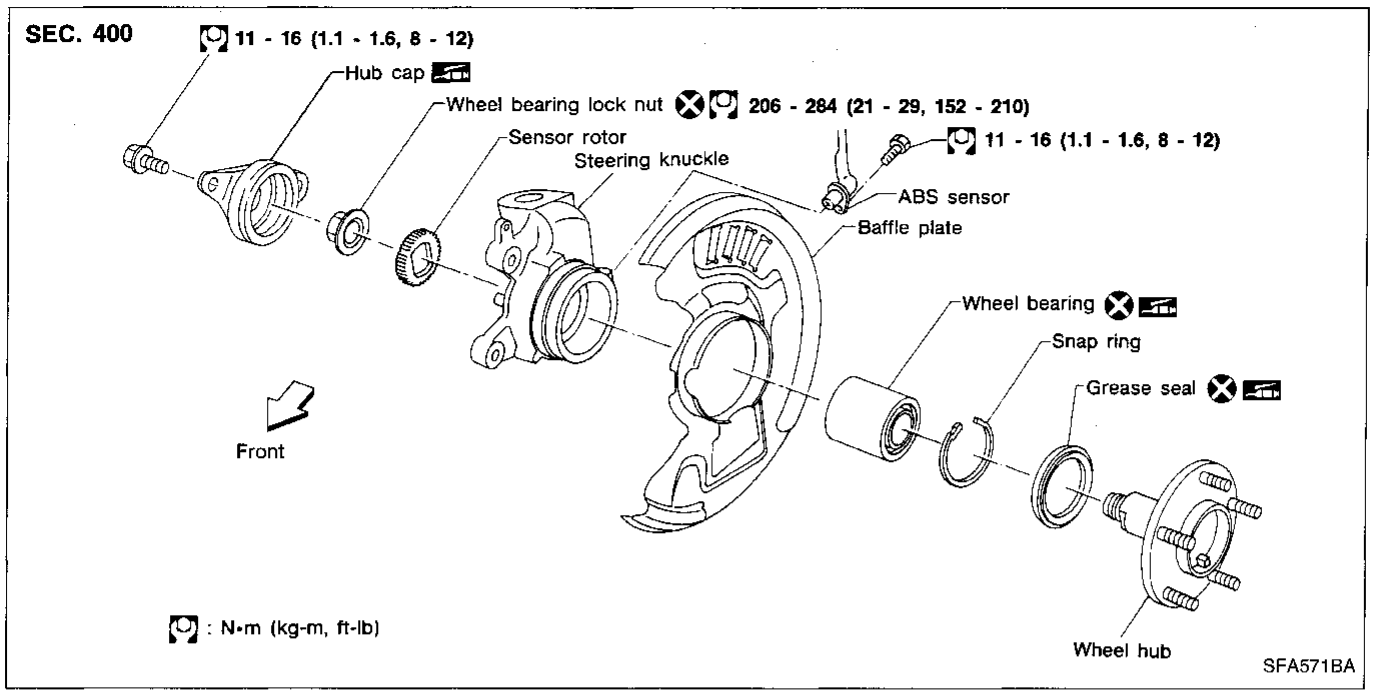
Make sure both tie-rods are the same length.
Standard length "L":
Refer to ST section ("Inspection and Adjustment", "SDS").

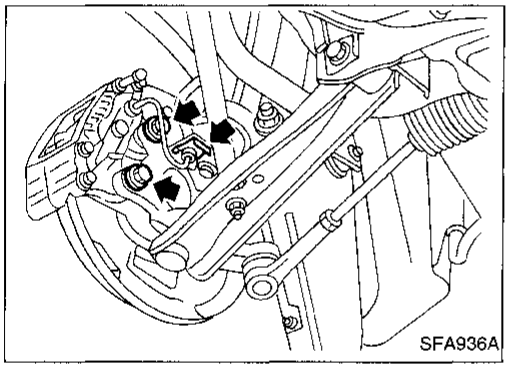
(3) Tighten lock nuts to the specified torque.
Lock nut tightening torque:
Refer to ST section ("POWER STEERING GEAR AND LINKAGE").



FRONT WHEEL TURNING ANGLE

1. Set wheels in straight-ahead position. Then, move vehicle forward until front wheels rest on turning radius gauge properly.
2. Rotate steering wheel all the way right and left; measure turning angle.
Wheel turning angle (Full turn):
Refer to SDS (FA-29).





Wheel Hub and Steering Knuckle

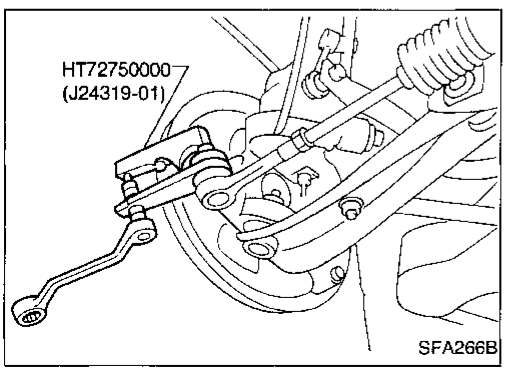
REMOVAL

CAUTION:

- **Before removing the front wheel hub assembly, disconnect the ABS wheel sensor from the assembly. Then move it away from the front wheel hub assembly area. Failure to do so may result in damage to the sensor wires and the sensor becoming inoperative.**
- **Wheel bearing does not require maintenance. If any of the following symptoms are noted, replace wheel bearing assembly.**
- Growling noise is emitted from wheel bearing during operation.
- Wheel bearing drags or turns roughly. This occurs when turning hub by hand after bearing lock nut is tightened to specified torque.

1. Remove brake caliper assembly and rotor.

Brake hose need not be disconnected from brake caliper. In this case, suspend caliper assembly with wire so as not to stretch brake hose. Be careful not to depress brake pedal, or caliper piston will pop out.
Make sure brake hose is not twisted.

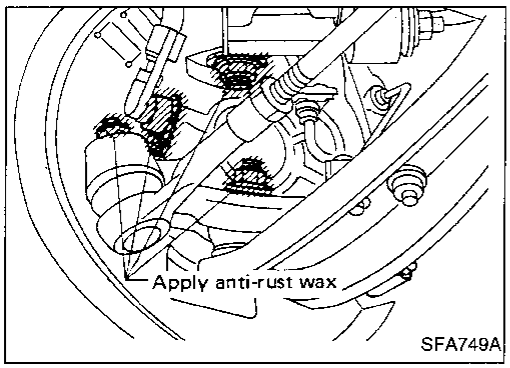


2. Remove tie-rod ball joint and lower ball joint with Tool.

CAUTION:
Steering knuckle is made from aluminum alloy.
Be careful not to hit steering knuckle.

3. Remove kingpin lower nut then remove steering knuckle assembly.

Wheel Hub and Steering Knuckle (Cont'd)

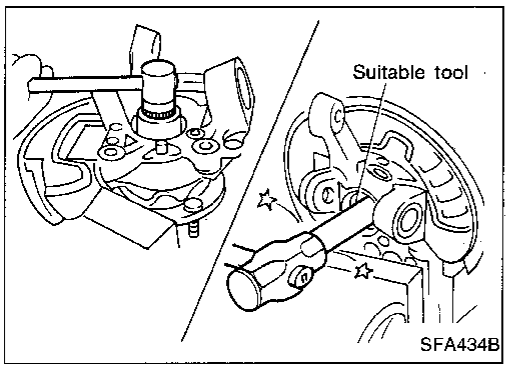


INSTALLATION

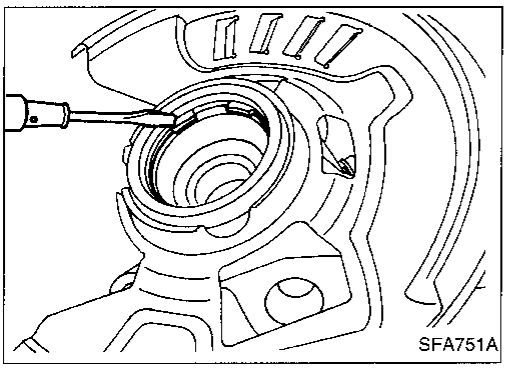
1. Install steering knuckle assembly.
2. Apply anti-rust wax as follows:
   - Portions around lower ball joint connections
   - Portions around tie-rod ball joint connections
   - Portions around kingpin lower nut location
   - Portions around ABS sensor connection

DISASSEMBLY

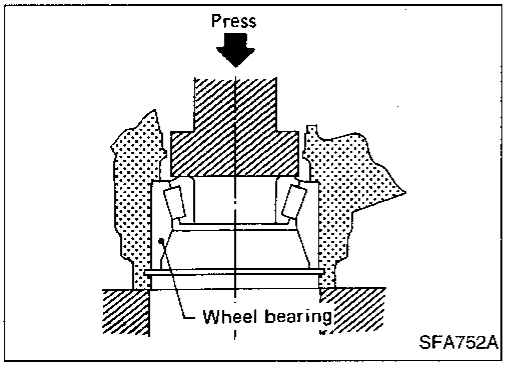
CAUTION:
When removing wheel bearing from steering knuckle, replace wheel bearing assembly (outer race, inner races and grease seal) with a new one.



1. Remove hub cap and wheel bearing lock nut.
2. Remove wheel hub with a suitable tool.

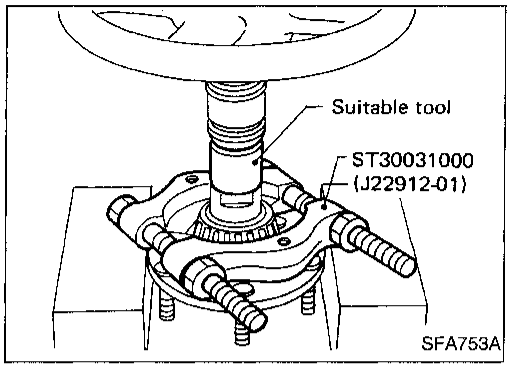


3. Remove snap ring with a suitable tool.



4. Press out wheel bearing assembly from steering knuckle.

Wheel Hub and Steering Knuckle (Cont'd)



5. Drive out wheel bearing inner race (to outside) from wheel hub, then remove grease seal.

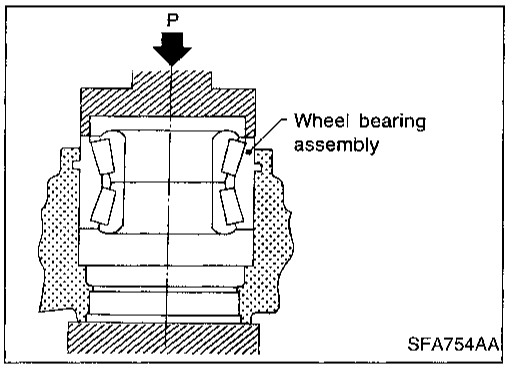
INSPECTION

Wheel hub and steering knuckle

Check wheel hub and steering knuckle for cracks by using magnetic exploration or dyeing test.

Snap ring

Check snap ring for wear or cracks.
Replace if necessary.

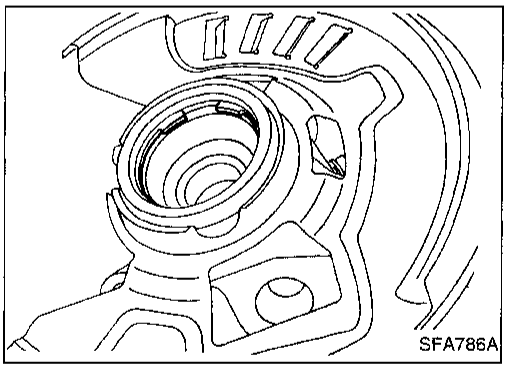


ASSEMBLY

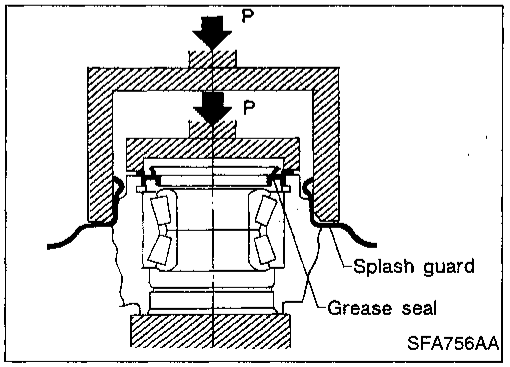
1. Press new wheel bearing assembly into steering knuckle from outside of steering knuckle.
   Maximum load P:
   34.3 kN (3.5 ton, 3.9 US ton, 3.44 Imp ton)

CAUTION:

- **Do not press inner race of wheel bearing assembly.**
- **Do not apply oil or grease to mating surfaces of wheel bearing outer race and wheel hub.**

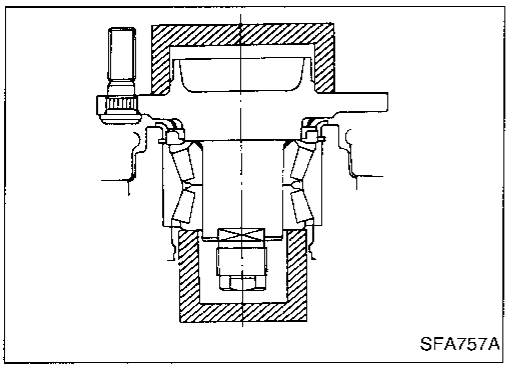


2. Install snap ring into groove of steering knuckle.



3. Apply multi-purpose grease to sealing lip.
4. Install grease seal.
   Maximum load P:
   10 kN (1 ton, 1.1 US ton, 1.0 Imp ton)
5. Install splash guard.

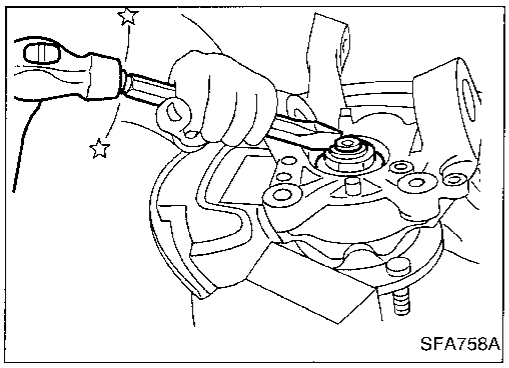
Wheel Hub and Steering Knuckle (Cont'd)


SFA757A

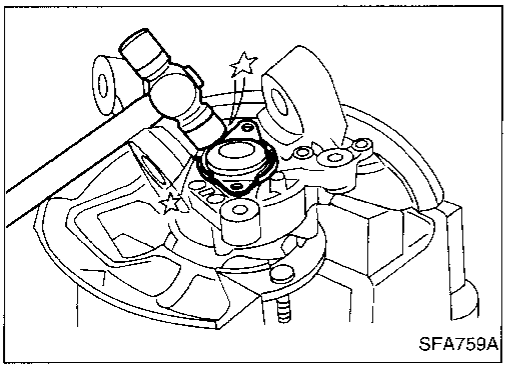
6. Press wheel hub into steering knuckle.
   Maximum load P:
   29 kN (3 ton, 3.3 US ton, 3.0 Imp ton)

Be careful not to damage grease seal.

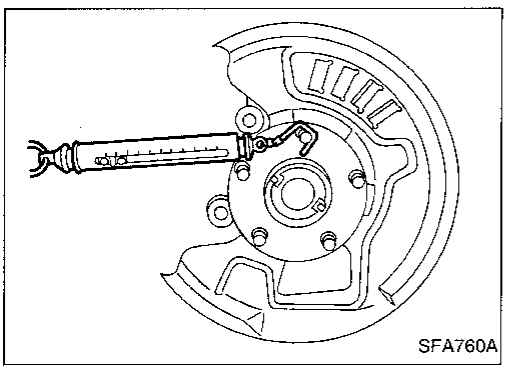
7. Tighten wheel bearing lock nut to the specified torque.
   : 206 - 284 N·m (21 - 29 kg-m, 152 - 210 ft-lb)


SFA758A

8. Stake wheel bearing lock nut.


SFA759A

9. Install hub cap.
   Apply multi-purpose grease to packing surface of hub cap.
   Drive hub cap onto steering knuckle by lightly tapping with a plastic hammer. After hub cap is in close contact with steering knuckle, tighten bolts.


SFA760A

10. Check wheel bearing preload and axial end play.

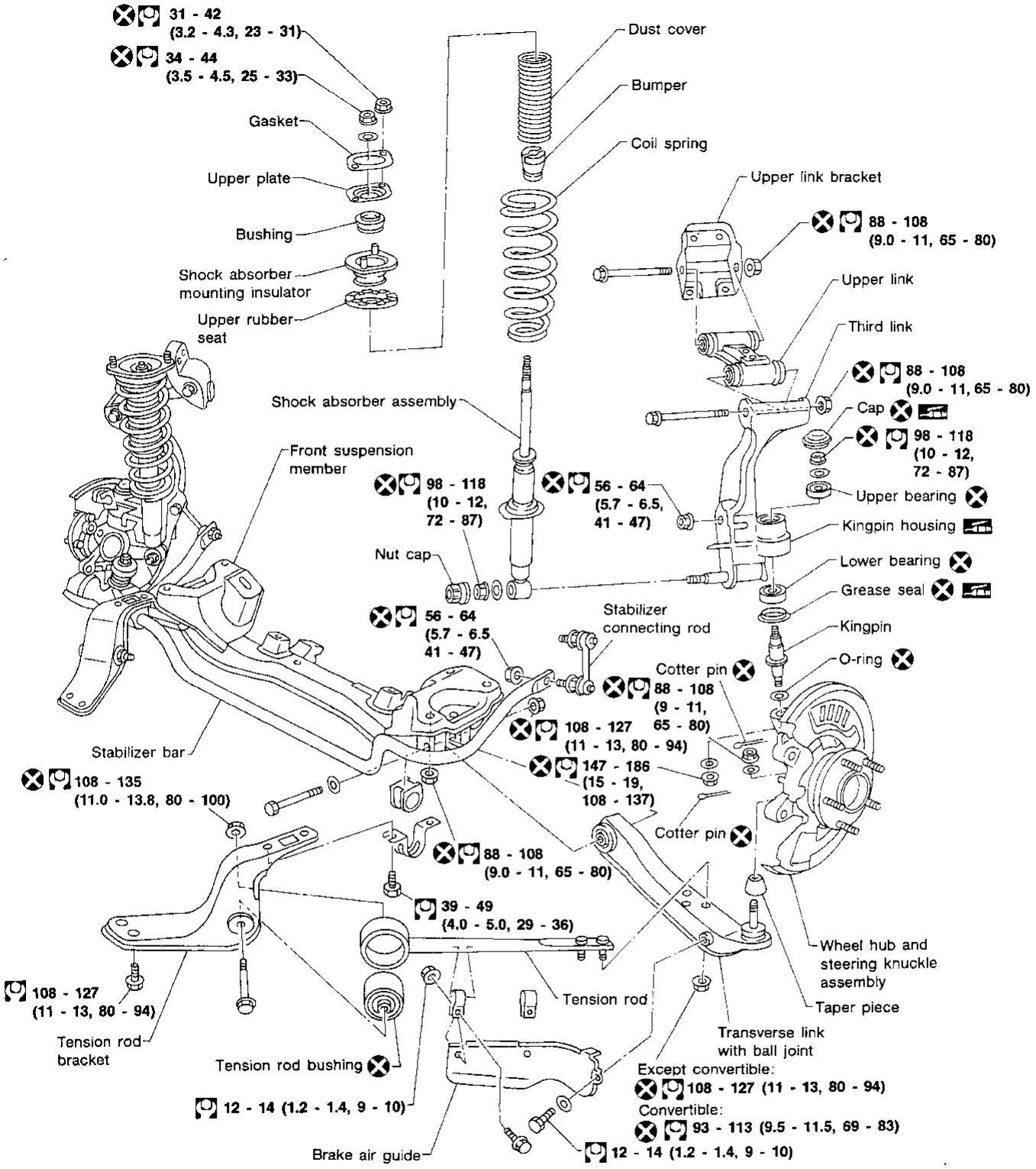
Before checking, spin wheel hub at least 10 revolutions in both directions.

Turning torque:
0.34 - 2.16 N·m (3.5 - 22.0 kg-cm, 3.0 - 19.1 in-lb)
(NSK bearing)
0.44 - 3.33 N·m (4.5 - 34.0 kg-cm, 3.9 - 29.5 in-lb)
(NTN bearing)

As measured at wheel hub bolt:
5.9 - 37.3 N (0.6 - 3.8 kg, 1.3 - 8.4 lb)
(NSK bearing)
7.8 - 57.9 N (0.8 - 5.9 kg, 1.8 - 13.0 lb)
(NTN bearing)

Axial end play:
0.05 mm (0.0020 in) or less

SEC. 400•401

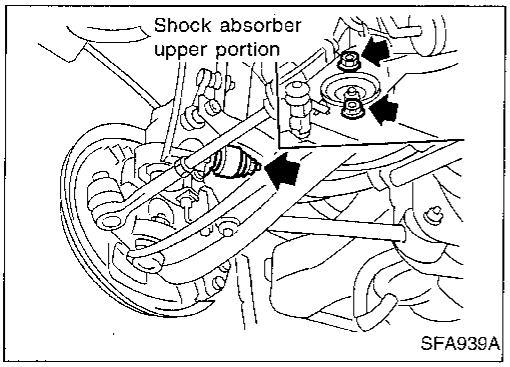


When installing rubber parts, final tightening must be carried out under unladen condition* with tires on ground.

*** Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.**

: N•m (kg-m, ft-lb)

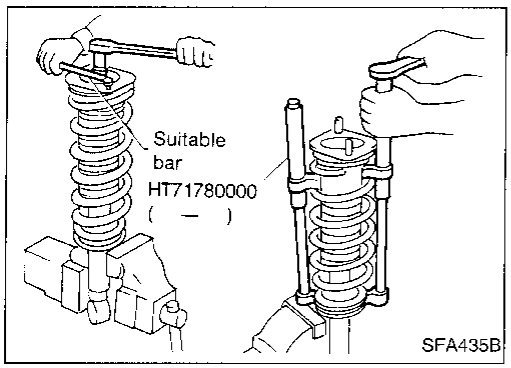
SFA251BB



Coil Spring and Shock Absorber

REMOVAL

- Remove shock absorber fixing bolt and nut (to hoodledge).
- **Do not remove piston rod lock nut on vehicle.**



DISASSEMBLY

1. Set shock absorber in vise with attachment, then **loosen** piston rod lock nut.

WARNING:
Do not remove piston rod lock nut at this time.

2. Compress spring with Tool so that shock absorber mounting insulator can be turned by hand.
3. Remove piston rod lock nut.

INSPECTION

Shock absorber assembly

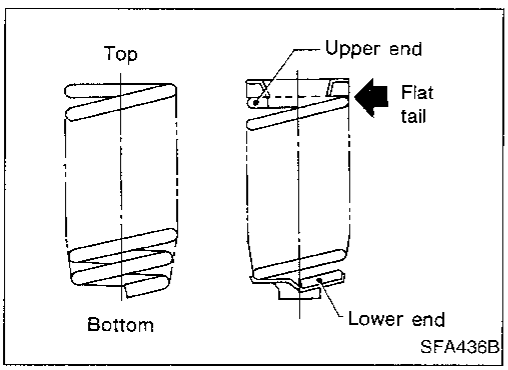
- Check for smooth operation through a full stroke, both compression and extension.
- Check for oil leakage on welded or gland packing portions.
- Check piston rod for cracks, deformation or other damage. Replace if necessary.

Mounting insulator and rubber parts

Check cemented rubber-to-metal portion for separation or cracks. Check rubber parts for deterioration. Replace if necessary.

Coil spring

Check for cracks, deformation or other damage. Replace if necessary.



ASSEMBLY

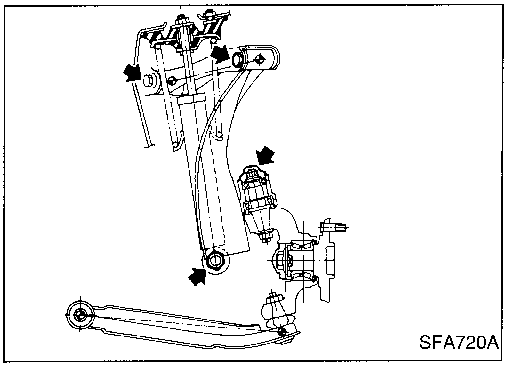
When installing coil spring on shock absorber, it must be positioned as shown in figure at left.

Third Link and Upper Link

REMOVAL

CAUTION:
Kingpin bearing usually does not require maintenance. If any of the following symptoms are noted, replace kingpin bearing assembly.

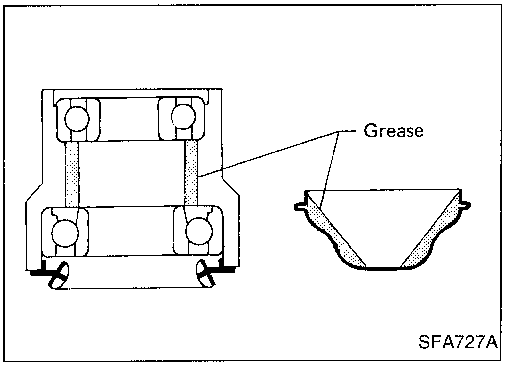
- **Growling noise is emitted from kingpin bearing during operation.**
- **Kingpin bearing drags or turns roughly when steering knuckle is turned by hand.**


SFA720A

1. Remove cap and kingpin upper nut.
   - **Do not remove kingpin lower nut.**
2. Remove shock absorber fixing nut and upper link fixing bolts.
3. Remove third link and upper link.

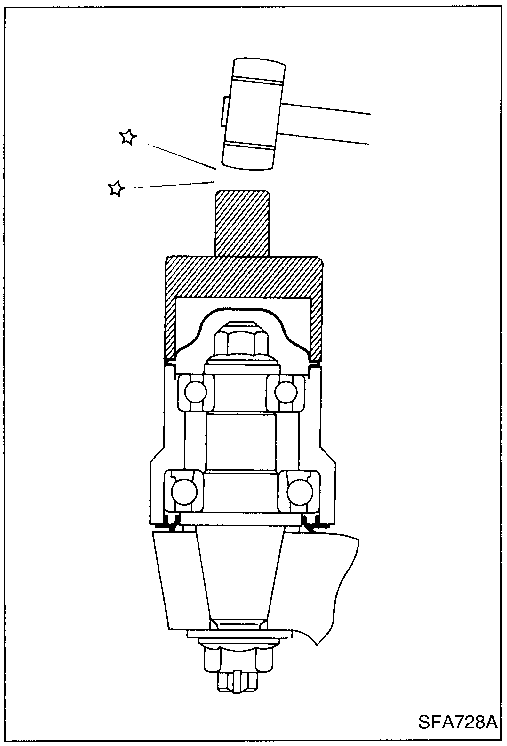
INSTALLATION

Third link



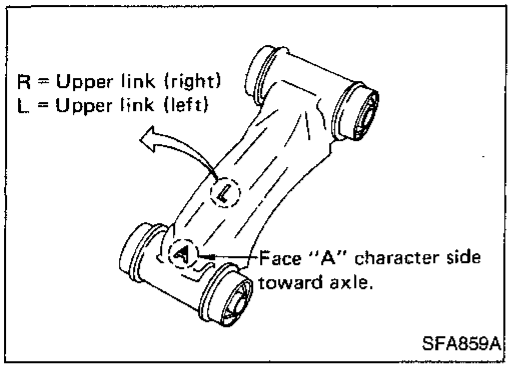
SFA727A

1. Pack kingpin housing and cap with multi-purpose grease before installing third link and cap.
   Grease capacity:
   Kingpin housing 10 g (0.35 oz)
   Cap 5 g (0.18 oz)


SFA728A

2. Install third link and cap.

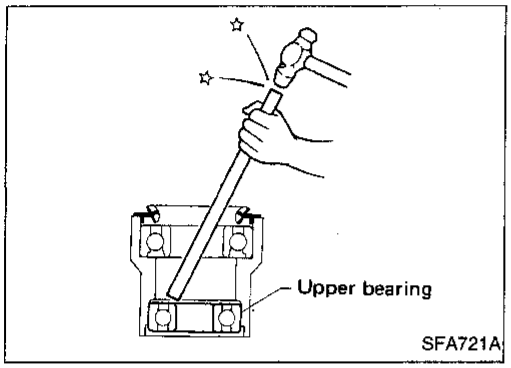
Third Link and Upper Link (Cont'd)



Upper link

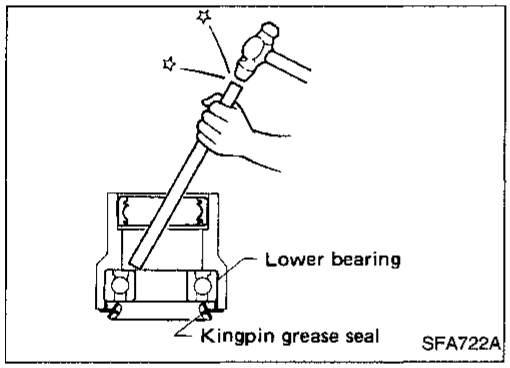
- Upper link has characters "A" and "L" (or "R") on it as shown. Always install upper link with "A" side facing axle and side without a character facing vehicle body.

Upper link bushings cannot be disassembled.

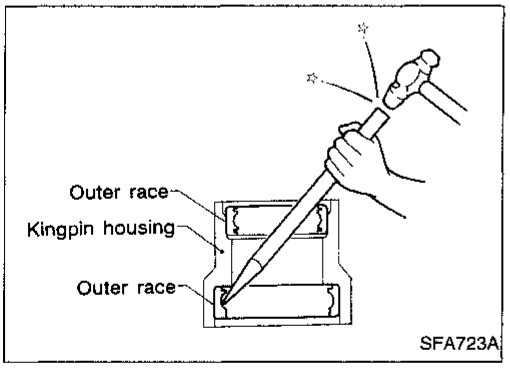


DISASSEMBLY

1. Remove upper bearing (inner race and ball).

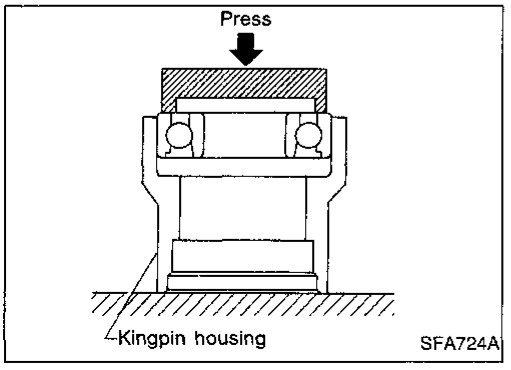


2. Remove kingpin grease seal.
3. Remove lower bearing (inner race and ball).



4. Remove upper and lower outer race.

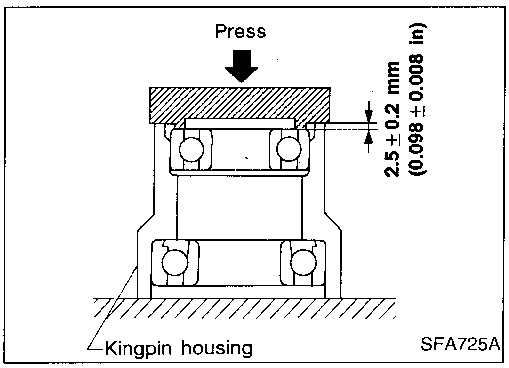
- **Be careful not to damage kingpin housing.**



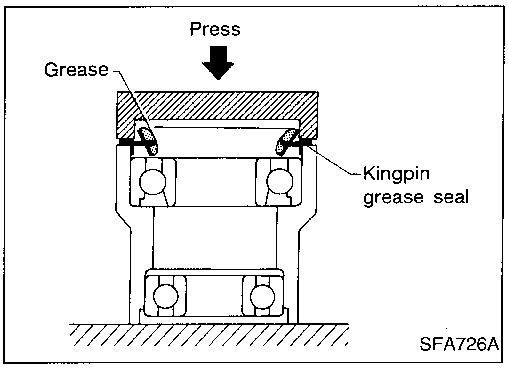
ASSEMBLY

1. Install lower bearing.

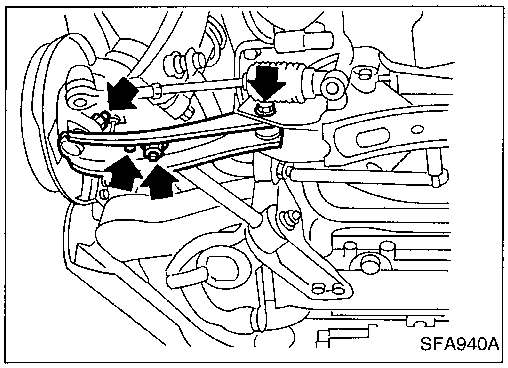
Third Link and Upper Link (Cont'd)



2. Install upper bearing.



3. Install kingpin grease seal.
4. Apply multi-purpose grease to oil seal lip.



Transverse Link and Lower Ball Joint

REMOVAL AND INSTALLATION

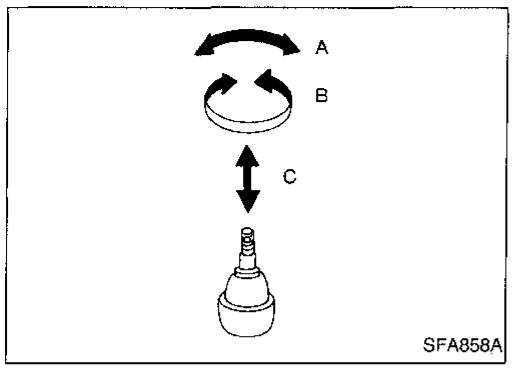
- Remove tension rod, ball joint and transverse link assembly.
- During installation, final tightening must be carried out at curb weight with tires on ground.
- After installation, check wheel alignment.
  Refer to "Front Wheel Alignment" of ON-VEHICLE SERVICE (FA-8).

INSPECTION

Transverse link

- Check transverse link and rubber bushing for damage, cracks or deformation.
  Replace if necessary.

Transverse Link and Lower Ball Joint (Cont'd)



Lower ball joint

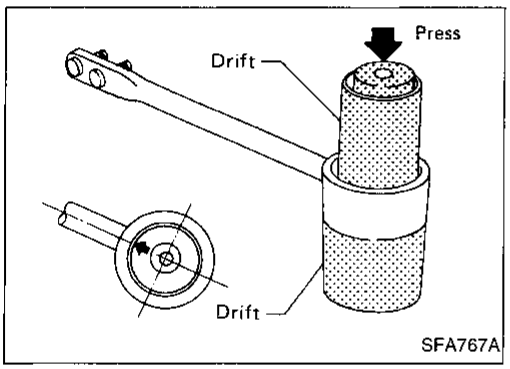
Check ball joint for excessive play. Replace transverse link assembly if any of the following exists:

- Ball stud is worn.
- Joint is hard to swing.
- Play in axial direction is excessive.

Before checking, turn ball joint at least 10 revolutions so that ball joint is properly broken in.

Swinging force "A":
(measuring point: cotter pin hole of ball stud)
7.8 - 53.0 N (0.8 - 5.4 kg, 1.8 - 11.9 lb)
Turning torque "B":
0.49 - 3.43 N·m (5.0 - 35.0 kg-cm, 4.3 - 30.4 in-lb)
Vertical end play limit "C":
0 mm (0 in)

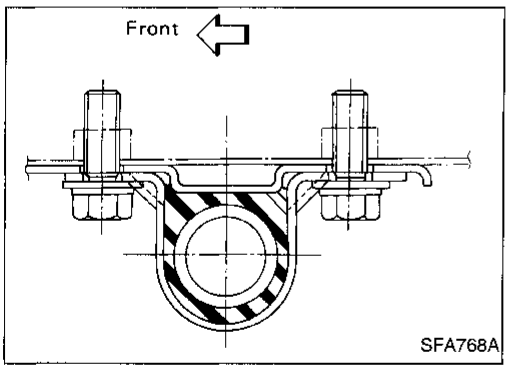
- Check dust cover for damage. Replace it and cover clamp if necessary.



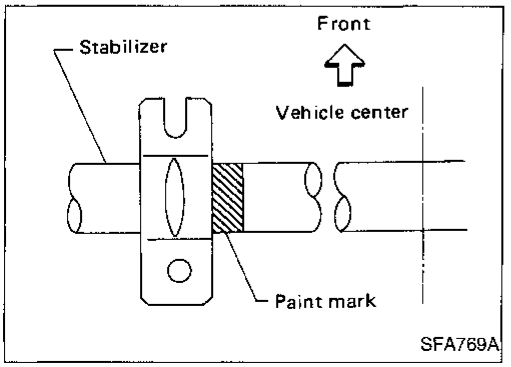
Tension Rod and Stabilizer Bar

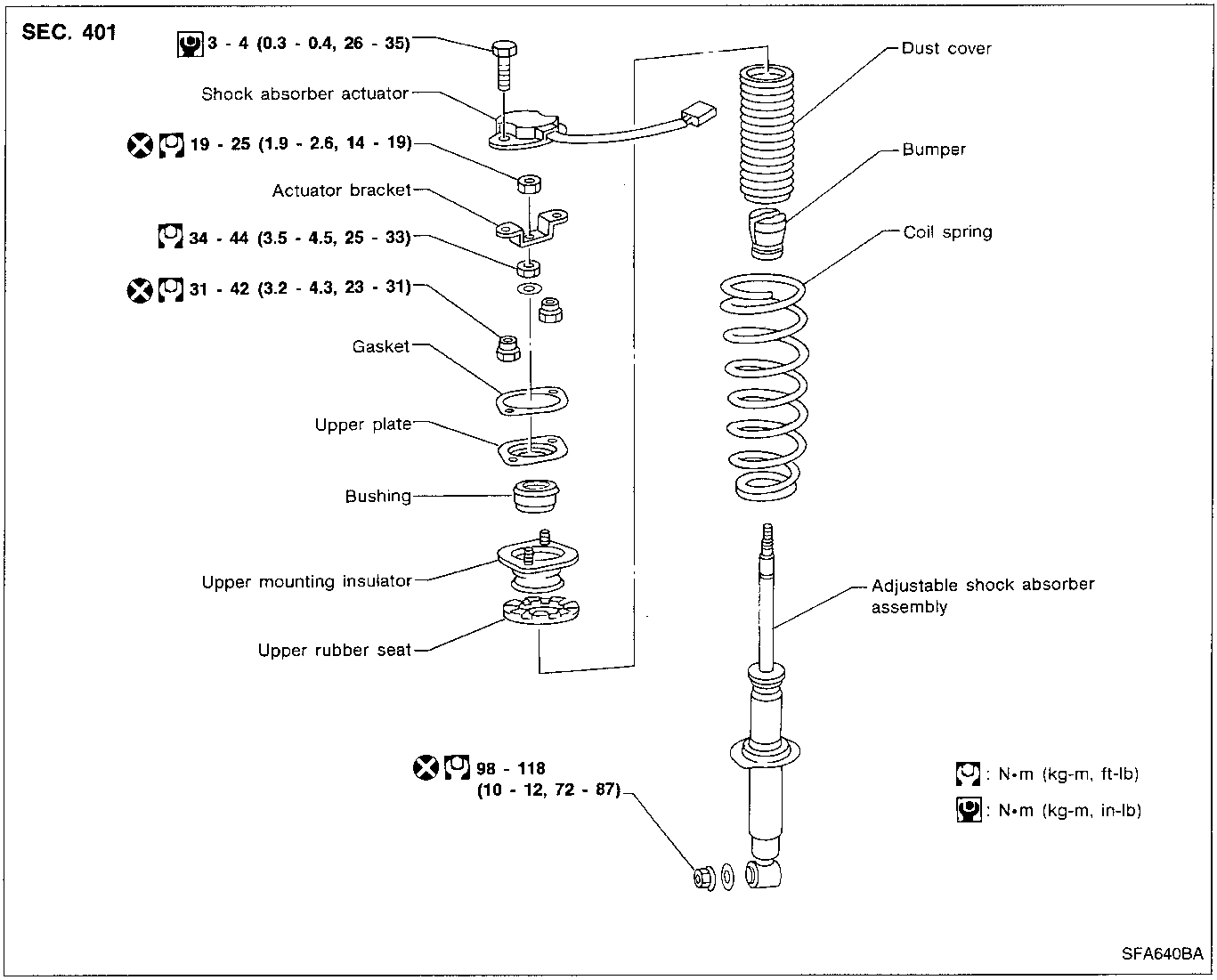
REMOVAL AND INSTALLATION

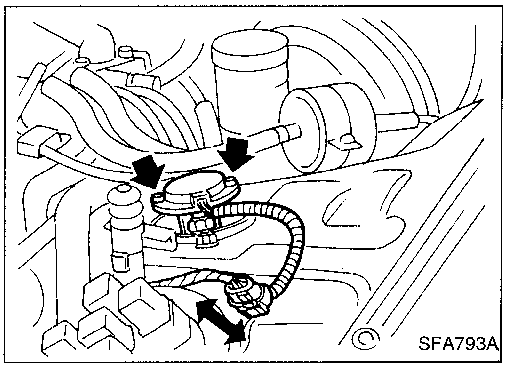
- Remove tension rod and stabilizer bar.
- Place a drift on lower side of tension rod bushing and another on upper side, as shown. Remove tension rod bushing by pressing it out.
- Place arrow mark on bushing facing tension rod before installing bushing.



- When installing stabilizer, make sure that paint mark and clamp face in their correct direction.

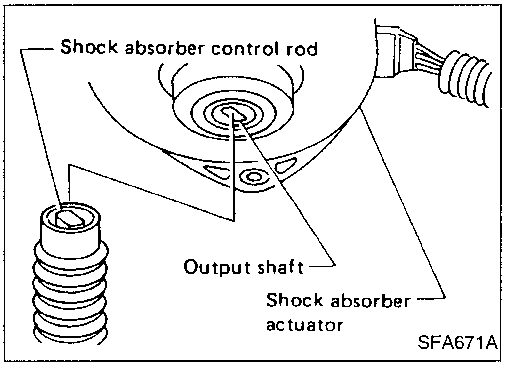






REMOVAL AND INSTALLATION

1. Disconnect sub-harness connector.
2. Remove shock absorber actuator fixing bolts.



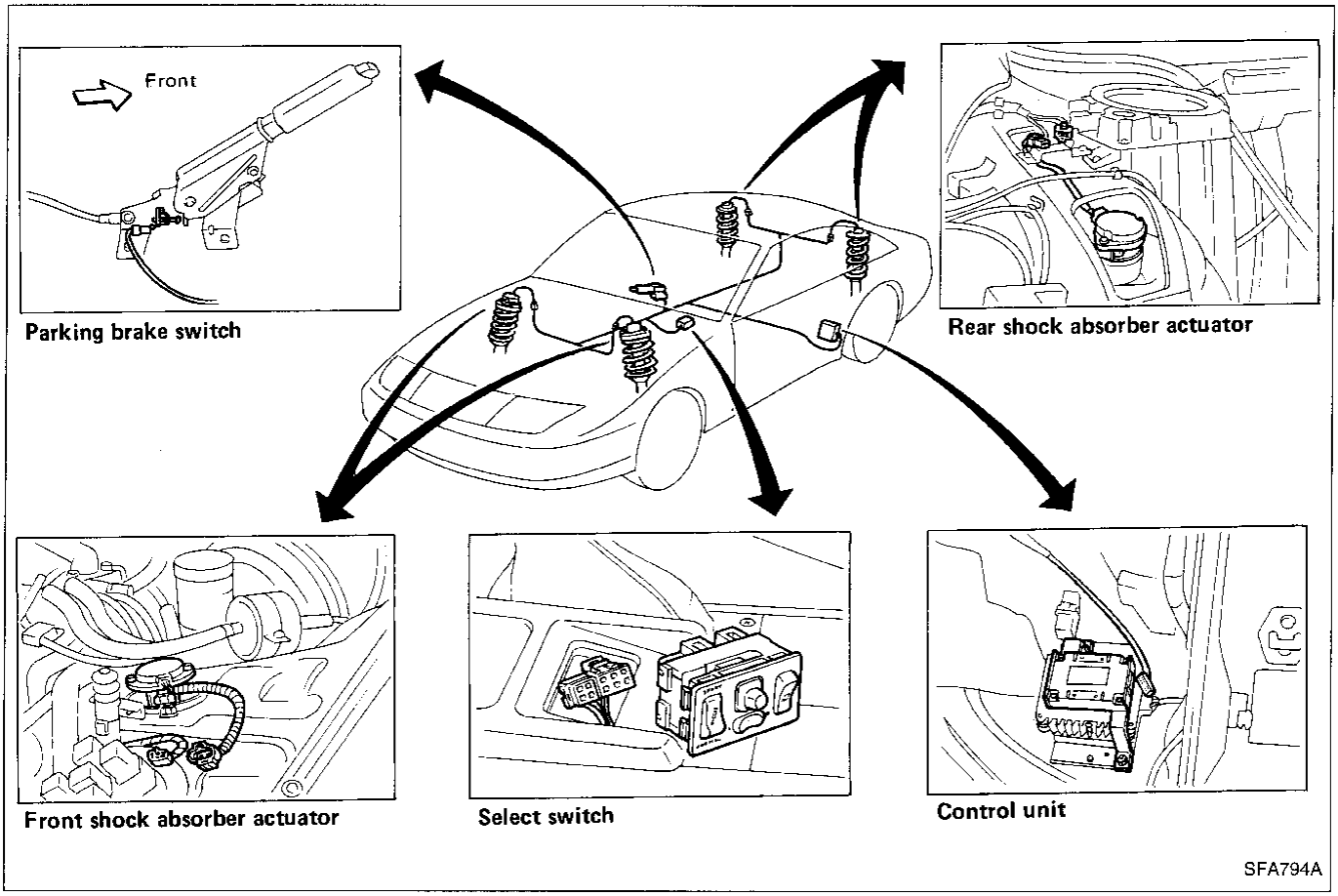
- **Before installing actuator, ensure shock absorber control rod is aligned with actuator output shaft. Otherwise, actuator may be damaged.**
- Refer to FRONT SUSPENSION for other procedures.

INSPECTION

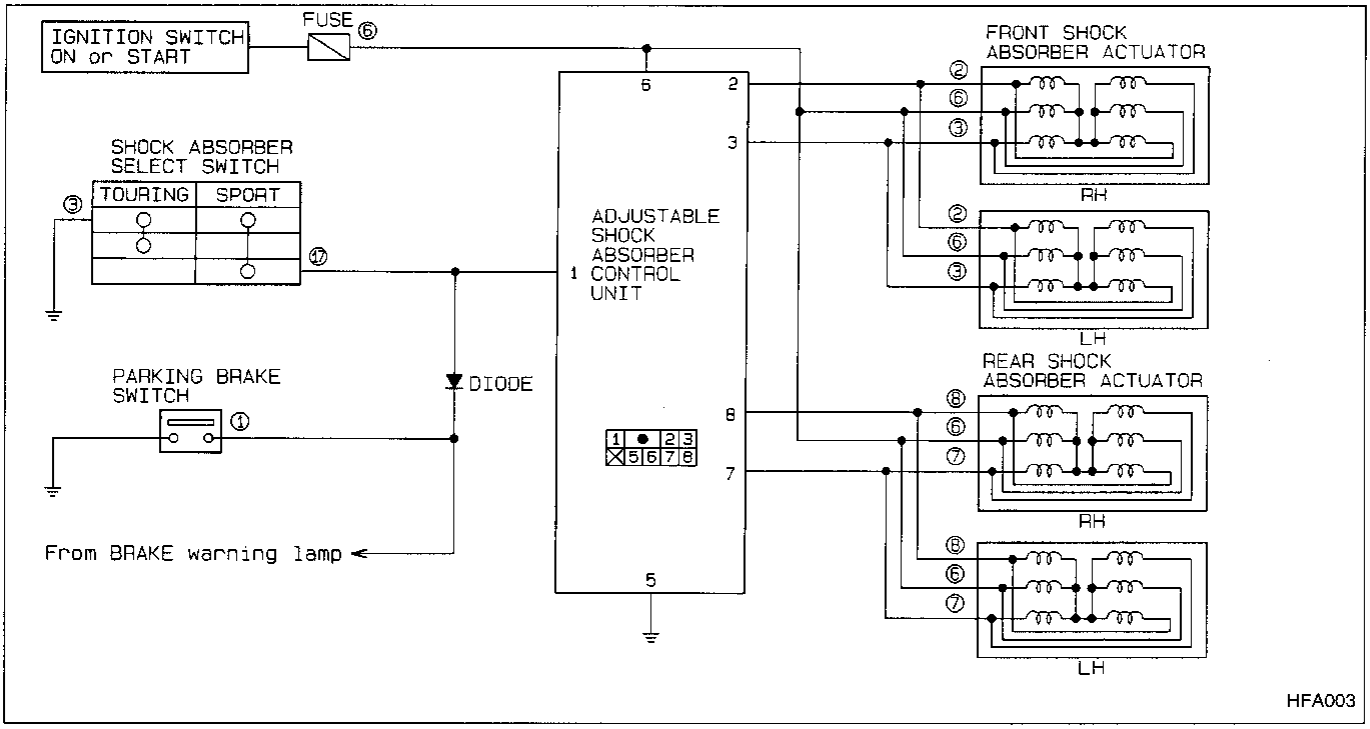
- Replace shock absorber assembly if it is damaged. Refer to FRONT SUSPENSION — Coil Spring and Shock Absorber (FA-15).

Trouble Diagnoses

COMPONENT PARTS AND HARNESS CONNECTOR LOCATION

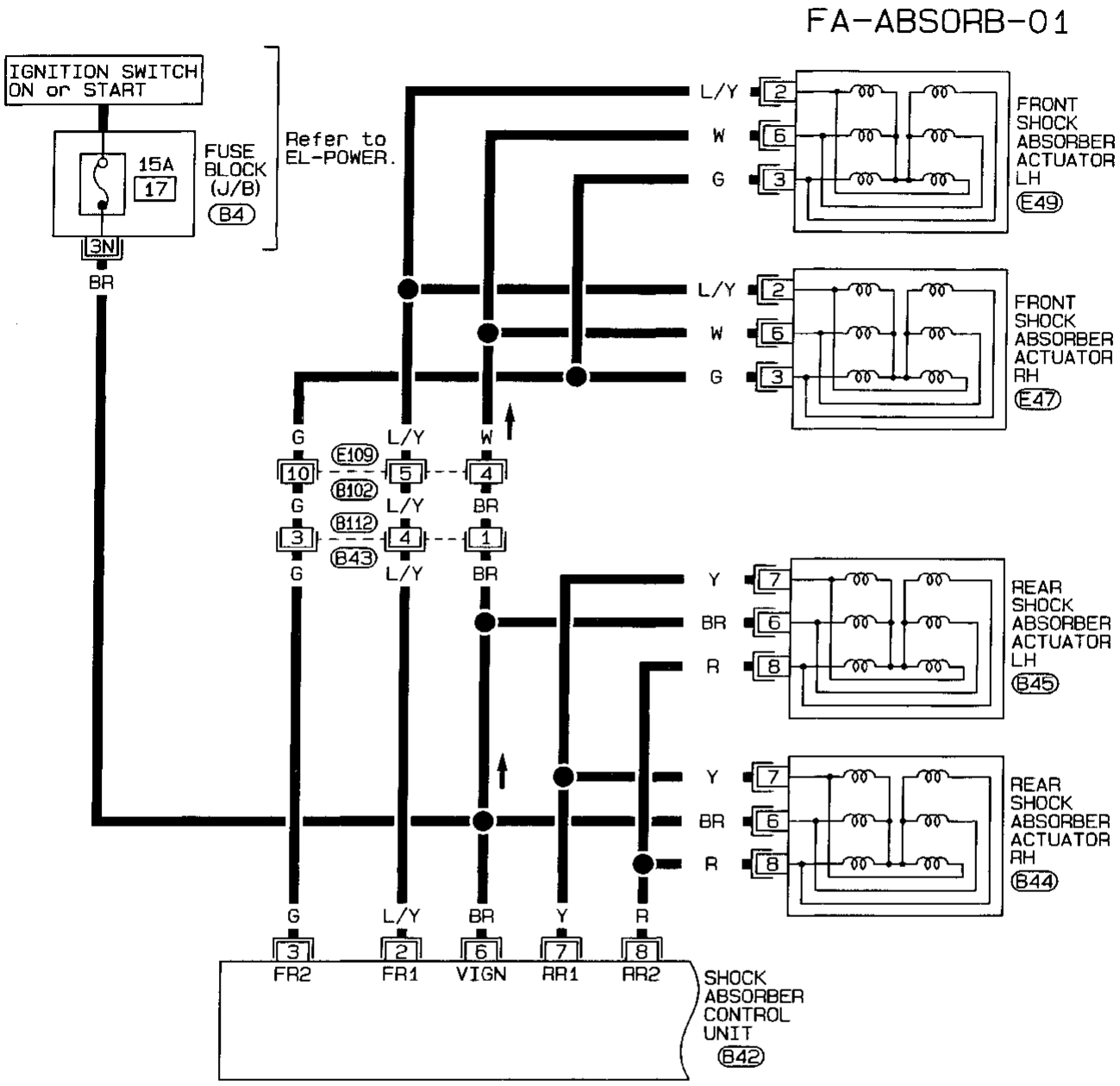


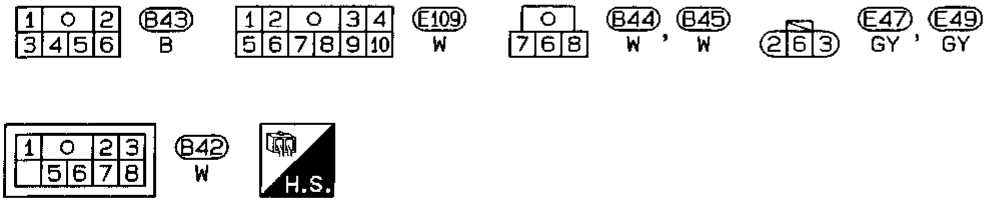
CIRCUIT DIAGRAM FOR QUICK PINPOINT CHECK



Trouble Diagnoses (Cont'd)

WIRING DIAGRAM

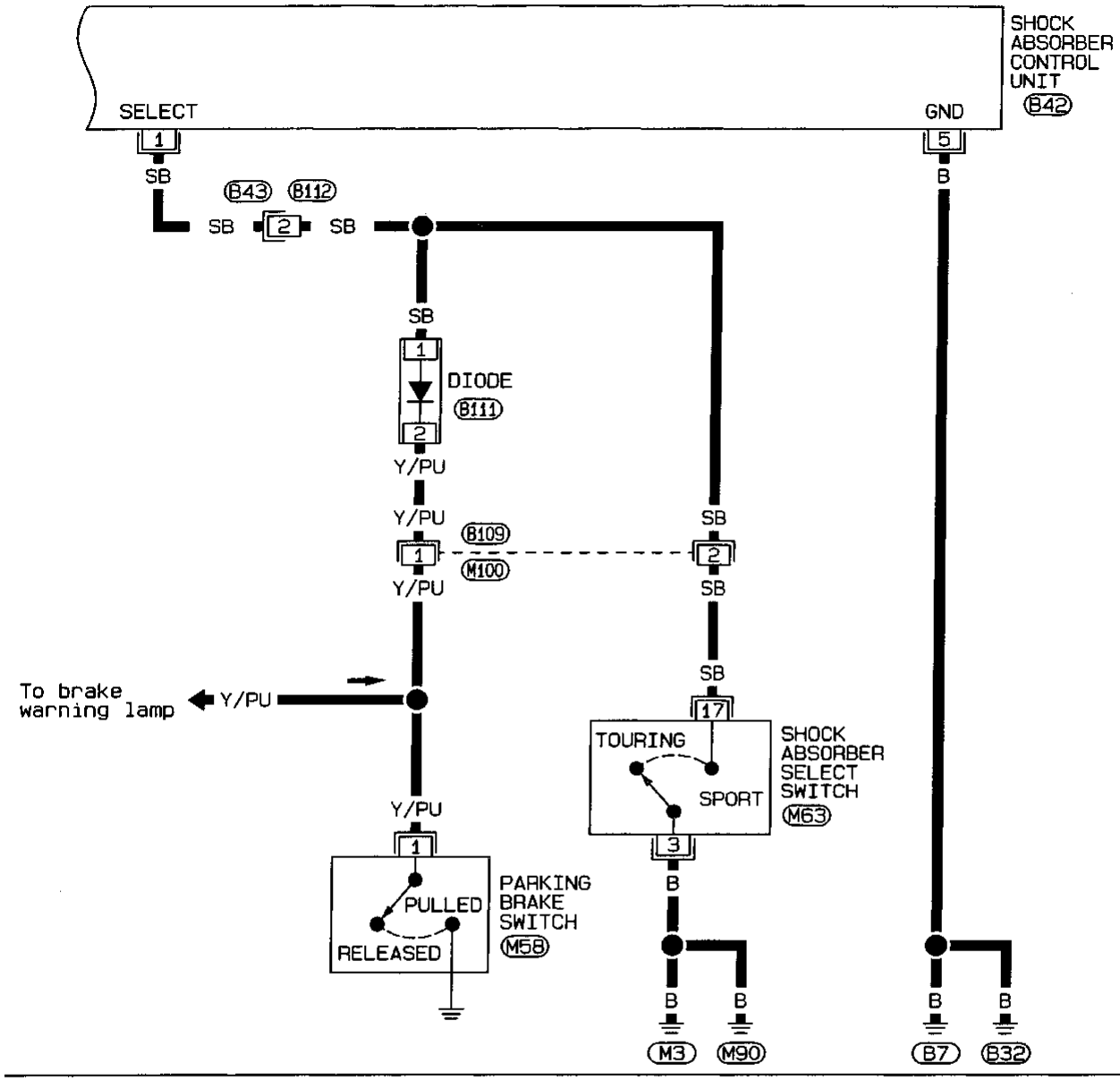


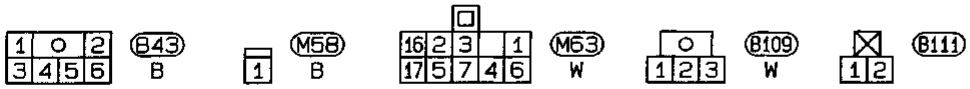


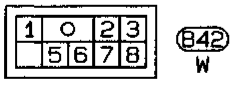
Refer to last page (Foldout page).
B4

HFA001

FA-ABSORB-02





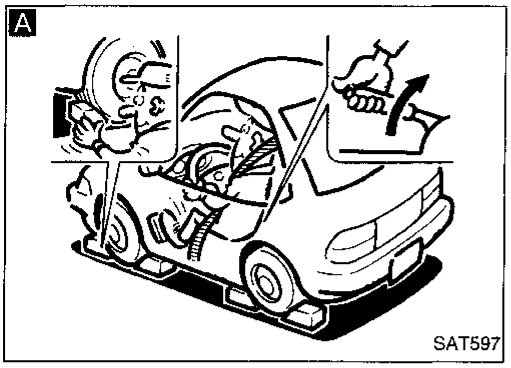


HFA002

Trouble Diagnoses (Cont'd)

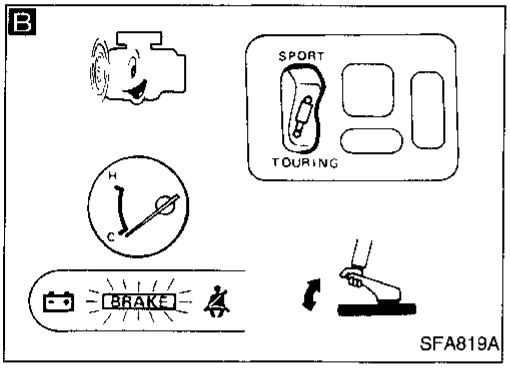
DIAGNOSTIC PROCEDURE

A



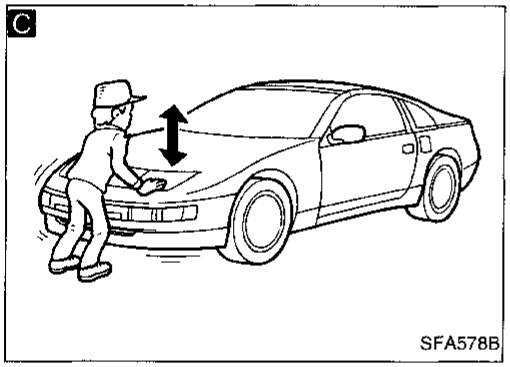
SAT597

B



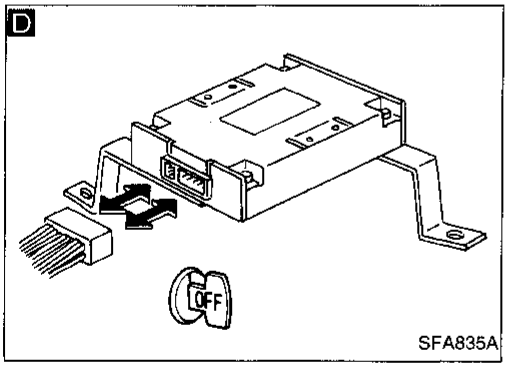
SFA819A

C



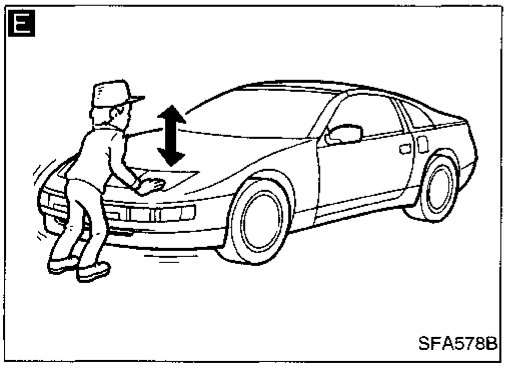
SFA578B

D



SFA835A

E



SFA578B

START

A

Engage parking brake and chock all four wheels.

B

CHECK PARKING BRAKE WARNING LAMP.
1) Set shift lever to "P" (A/T model) or "N" (M/T model).
2) Set select switch to "TOURING".
3) Start engine.
4) Check that parking brake warning lamp comes on when engine starts.

No → Repair or replace parking brake switch, warning lamp or harness.

Yes

C

CHECK SWITCHING OF SHOCK ABSORBER ACTUATOR.
- Release and engage parking brake.
- Push down on body above each wheel with your hand to check damping force of shock absorber.
- Release parking brake. Push down on body above each wheel to check if damping force of shock absorber changes.

Damping force of all shock absorber does not change.

D

CHECK CONNECTOR CONTINUITY.
Disconnect control unit and select switch connectors and reconnect them firmly.

Ⓐ (See next page.)

Damping force of one or more shock absorbers changes.

E

CHECK SWITCHING OF SHOCK ABSORBER ACTUATOR.
- Release parking brake.
- Move select switch from "TOURING" to "SPORT".
- Push down on body above each wheel with your hand to see if damping force of each shock absorber changes.

Ⓑ (See next page.)

Damping force of all shock absorbers does not change.

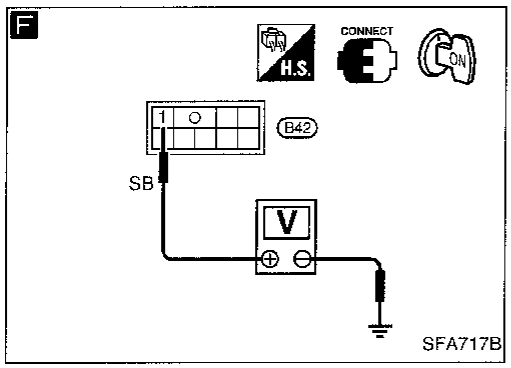
Ⓒ (Skip page.)

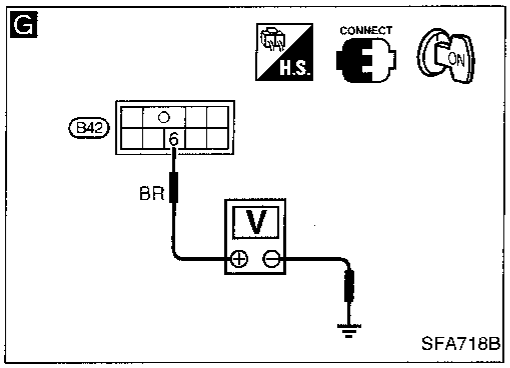
Damping force of some shock absorbers does not change.

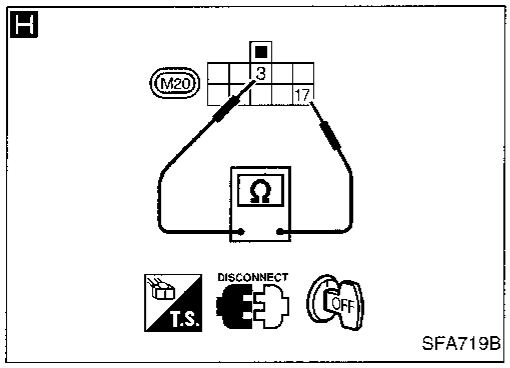
Damping force of all shock absorbers changes.

END

Trouble Diagnoses (Cont'd)







Ⓐ

F

CHECK CONTROL UNIT INPUT SIGNAL.
Check control unit input signal at terminal ①.
- Set select switch to "TOURING".
- Parking brake lever:
  Released ...
  Approx. 12V OK
  Engaged ... 0V

12V are indicated regardless of parking brake lever position.

→ Repair or replace harness between control unit and parking brake switch.

0V are indicated regardless of parking lever position.

OK ↓

G

CHECK CONTROL UNIT POWER SUPPLY.
1) Turn ignition switch "ON".
2) Measure voltage across control unit terminals ⑥ and ground.
Voltage:
Approximately 12V
... OK

OK ↓

Replace control unit.

NG →

Check and repair fuse and power supply harness.

H

CHECK SELECT SWITCH CONTINUITY.
1) Disconnect select switch connector.
2) Set select switch to "SPORT".
3) Check continuity between select switch terminal ⑰ and ③.
Continuity should exist.

OK ↓

Repair or replace harness between control unit and parking brake switch.

NG →

Replace select switch.

Ⓑ

H

CHECK SELECT SWITCH CONTINUITY.
1) Disconnect select switch connector.
2) Set select switch to "SPORT".
3) Check continuity between select switch terminal ⑰ and ③.
Continuity should exist.

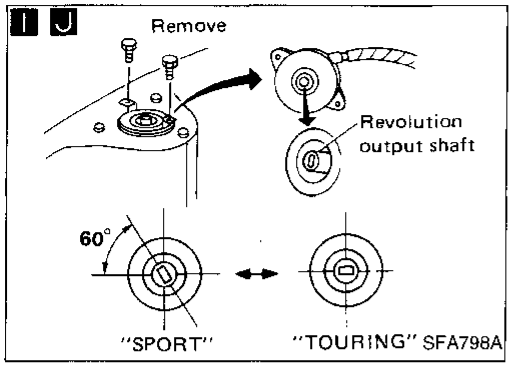
NG →

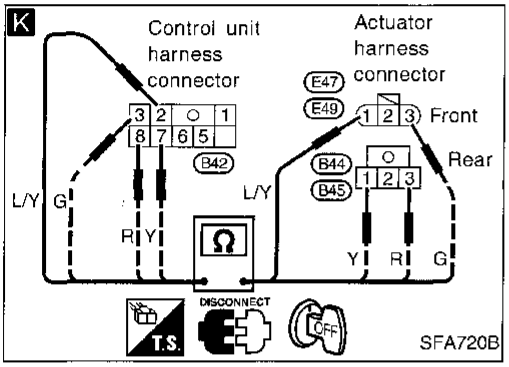
Replace select switch.

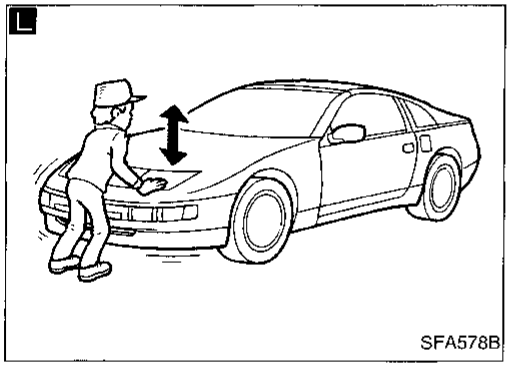
OK ↓

Repair or replace harness between control unit and select switch.

Trouble Diagnoses (Cont'd)







Ⓒ

Rubbing noise is emitted from actuator.

I

CHECK ACTUATOR.
Remove actuator from shock absorber (for those shock absorbers in which damping force does not change). Switch select switch to check if actuator output shaft rotates.

→ Replace actuator.

Output shaft rotates.
→ Ⓓ (See below.)

Output shaft does not rotate.

J

Interchange left and right actuators and check that output shafts rotate.

Yes → Old actuator malfunctions. Replace.

No

K

CHECK HARNESS CONTINUITY BETWEEN CONTROL UNIT AND ACTUATOR.
1) Disconnect control unit connector and actuator connector.
2) Check continuity between control unit harness connector terminals and corresponding terminals of actuator harness connector.
Continuity should exist.

NG → Repair or replace harness between control unit and actuator.

OK

Replace control unit.

Ⓓ

Visually check bracket for deformities.

NG → Replace bracket.

OK

L

CHECK SWITCHING OF SHOCK ABSORBER ACTUATOR.
After checking that output shafts rotate with left and right actuators interchanged, install actuator on shock absorber for which damping force does not change, and check that damping force changes properly.

NG → Replace shock absorber.

OK

Old actuator malfunctions.
Replace.

Trouble Diagnoses (Cont'd)

Control and operation of shock absorber damping force

	Select switch	
	TOURING	SPORT
Parking brake lever released	Soft	Firm
Parking brake lever engaged	Firm	Firm

Control unit inspection table

Terminal No.	Connected to	Standard value
①	Select switch and parking brake switch	0V ("SPORT"); 12V ("TOURING") *1 0V (parking brake lever engaged); *2 12V (parking brake lever released)
②	Front actuator "Firm"	When select signal is emitted, 12V (approx.) instantaneously drops to 2 - 3V. *1
③	Front actuator "Soft"	When select signal is emitted, 12V (approx.) instantaneously drops to 2 - 3V. *1
⑤	GND	0V
⑥	IGN	Approx. 12V
⑦	Rear actuator "Firm"	When select signal is emitted, 12V (approx.) instantaneously drops to 2 - 3V. *1
⑧	Rear actuator "Soft"	When select signal is emitted, 12V (approx.) instantaneously drops to 2 - 3V. *1

*1: Measure with parking brake released.
*2: Measure with select switch set to "TOURING".

General Specifications

COIL SPRING

Applied model			2 seater (Non-turbocharger), Convertible	2+2 seater (Non-turbo-charger)	Turbocharger
Wire diameter		mm (in)	12.1 (0.476)	11.9 (0.469)	12.1 (0.476)
Coil outer diameter mm (in)	Large		112.2 (4.42)	111.8 (4.40)	112.2 (4.42)
	Small		92.2 (3.63)	91.8 (3.61)	92.2 (3.63)
Free length		mm (in)	360 (14.17)	370 (14.57)	
Spring constant		N/mm (kg/mm, lb/in)	29.4 (3.0, 168)	27.5 (2.8, 157)	29.4 (3.0, 168)
Identification color			Light blue x 1, Pink x 1	Light blue x 2	Light blue x 1, Orange x 1

SHOCK ABSORBER

Applied model	Non-turbocharger	Turbocharger	
Piston rod diameter mm (in)	12.5 (0.492)	14.0 (0.551)	
Damping force [at 0.3 m (1.0 ft)/sec.] N (kg, lb)		Sport	Touring
Expansion	1,177 - 1,569 (120 - 160, 265 - 353)	1,608 - 2,118 (164 - 216, 362 - 476)	1,138 - 1,510 (116 - 154, 256 - 340)
Compression	559 - 814 (57 - 83, 126 - 183)	971 - 1,383 (99 - 141, 218 - 311)	686 - 981 (70 - 100, 154 - 221)

STABILIZER BAR

Applied model	2 seater	2+2 seater
Stabilizer diameter mm (in)	27.2 (1.071)	28.6 (1.126)
Identification color	White	Purple

TENSION ROD

Rod diameter mm (in)	20.0 (0.787)

Inspection and Adjustment

WHEEL ALIGNMENT (Unladen*1)

Applied model				2 seater	2 + 2 seater
Camber		Degree minute (Decimal degree)	Minimum	−1°35′ (−1.58°)	
			Nominal	−0°50′ (−0.83°)	
			Maximum	−0°05′ (−0.08°)	
			Left and right difference	45′ (0.75°) or less	
Caster		Degree minute (Decimal degree)	Minimum	8°55′ (8.92°)	
			Nominal	9°40′ (9.67°)	
			Maximum	10°25′ (10.42°)	
			Left and right difference	45′ (0.75°) or less	
Kingpin inclination		Degree minute (Decimal degree)	Minimum	12°10′ (12.17°)	
			Nominal	12°55′ (12.92°)	
			Maximum	13°40′ (13.67°)	
Total toe-in			Minimum	0 (0)	1 (0.04)
Distance (A - B)		mm (in)	Nominal	1 (0.04)	2 (0.08)
			Maximum	2 (0.08)	3 (0.12)
Angle (left plus right)		Degree minute (Decimal degree)	Minimum	0′ (0.00°)	5′ (0.08°)
			Nominal	5′ (0.08°)	11′ (0.18°)
			Maximum	11′ (0.18°)	16′ (0.27°)
Wheel turning angle	Inside	Degree minute (Decimal degree)	Minimum	32°30′ (32.50°)	
Full turn*2			Nominal	34°30′ (34.50°)	
			Maximum	36°30′ (36.50°)	
	Outside	Degree minute (Decimal degree)	Nominal	28°30′ (28.50°)	

*1: Fuel, radiator coolant and engine oil full. Spare tire, jack, hand tools and mats in designated positions.

*2: On power steering models, wheel turning force (at circumference of steering wheel) of 98 to 147 N (10 to 15 kg, 22 to 33 lb) with engine idle.

WHEEL BEARING

Wheel bearing axial end play mm (in)	0.05 (0.0020) or less
Wheel bearing lock nut	
Tightening torque N·m (kg-m, ft-lb)	206 - 284 (21 - 29, 152 - 210)
Wheel bearing turning resistance N·m (kg-cm, in-lb)	
NSK bearing	0.34 - 2.16 (3.5 - 22.0, 3.0 - 19.1)
NTN bearing	0.44 - 3.33 (4.5 - 34.0, 3.9 - 29.5)
At wheel hub bolt N (kg, lb)	
NSK bearing	5.9 - 37.3 (0.6 - 3.8, 1.3 - 8.4)
NTN bearing	7.8 - 57.9 (0.8 - 5.9, 1.8 - 13.0)

LOWER BALL JOINT

Swinging force "A" (Measuring point: cotter pin hole of ball stud) N (kg, lb)	7.8 - 53.0 (0.8 - 5.4, 1.8 - 11.9)
Turning torque "B" N·m (kg-cm, in-lb)	0.49 - 3.43 (5.0 - 35.0, 4.3 - 30.4)
Vertical end play "C" mm (in)	0 (0)

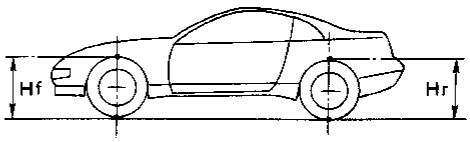
WHEEL RUNOUT (Radial and lateral)

Aluminum wheel	mm (in)	0.3 (0.012) or less

WHEELARCH HEIGHT

Unit: mm (in)

	Non-turbocharger		Turbocharger
	2 seater	2+2 seater	2 seater
Front (Hf)	675 (26.57)	677 (26.65)	675 (26.57)
Rear (Hr)	676 (26.61)	675 (26.57)	675 (26.57)



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