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# **PRECAUTIONS**

PRECAUTIONS PFP:00001

Cautions

When installing rubber bushings, final tightening must be carried out under unladen conditions with tires
on level ground. Oil will shorten the life of rubber bushings. Be sure to wipe off any spilled oil.

- Unladen conditions means that fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.
- After servicing suspension parts, be sure to check wheel alignment.
- Caulking nuts are not reusable. Always use new ones when installing. Since new caulking nuts are preoiled, tighten as they are.

# **PREPARATION**

#### **PREPARATION** PFP:00002 Α **Special Service Tools (SST)** AES000EB The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here. В Tool number (Kent-Moore No.) Description **Tool** name ST3127S000 (See J25742-1) Preload Gauge 1. GG91030000 D Torque wrench (J25765) Measuring rotating torque of ball joint 2. HT62940000 ( — ) Socket adapter (1/2") 3. HT62900000 ( — ) RSU NT124 Socket adapter (3/8")

# Tool name Description Removing wheel nuts Removing brake caliper assembly Removing rear suspension component parts

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RSU-3

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING NVH Troubleshooting Chart

PFP:00003

AES000ED

Use chart below to help you find the cause of the symptom. If necessary, repair or replace these parts.

Reference page			RSU-7	RSU-9	I	I	I	RSU-7	RSU-5	RSU-16	NVH in PR section.	NVH in RFD section.	NVH in RAX and RSU sections.	NVH in WT section.	NVH in WT section.	NVH in RAX section.	NVH in BR section.	NVH in PS section.
Possible cause and SUSPECTED PARTS			Improper installation, looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	PROPELLER SHAFT	DIFFERENTIAL	REAR AXLE AND REAR SUSPENSION	TIRES	ROAD WHEEL	DRIVE SHAFT	BRAKES	STEERING
		Noise	×	×	×	×	×	×			×	×	×	×	×	×	×	×
	REAR SUSPENSION	Shake	×	×	×	×		×			×		×	×	×	×	×	×
		Vibration	×	×	×	×	×				×		×	×		×		×
Symptom		Shimmy	×	×	×	×			×				×	×	×		×	×
		Judder	×	×	×								×	×	×		×	×
		Poor quality ride or handling	×	×	×	×	×		×	×			×	×	×			

<sup>×:</sup> Applicable

## **REAR SUSPENSION ASSEMBLY**

PFP:55020

# **On-Vehicle Inspection and Service**

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Make sure the mounting conditions (looseness, back lash) of each component and component status (wear, damage) are normal.

## **INSPECTION OF BALL JOINT END PLAY**

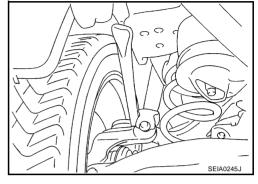
Measure axial end play by installing and moving up/down with an iron pry bar or something similar between suspension arm and axle.

Standard value

Axial end play : 0 mm (0 in)

## **CAUTION:**

Be careful not to damage ball joint boot.



## SHOCK ABSORBER INSPECTION

Check shock absorber for oil leakage, damage and replace if necessary.

# Wheel Alignment Inspection DESCRIPTION

AES000EG

Measure wheel alignment under unladen conditions. "Unladen conditions" means that fuel, engine coolant, and lubricant are full. Spare tire, jack, hand tools and mats in designated positions.

## PRELIMINARY INSPECTION

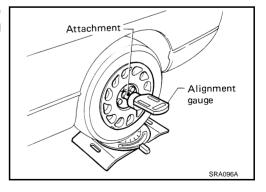
- 1. Check tires for improper air pressure and wear.
- 2. Check road wheels for runout. Refer to WT-3, "Inspection".
- 3. Check wheel bearing axial end play. Refer to RAX-6, "WHEEL BEARING INSPECTION" .
- 4. Check suspension arm ball joint axial end play. Refer to RSU-11, "SUSPENSION ARM".
- 5. Check shock absorber operation.
- 6. Check each mounting part of axle and suspension for looseness and deformation.
- 7. Check each link, arm and member for cracks, deformation, and other damage.
- 8. Check vehicle posture.

## **CAMBER INSPECTION**

 Measure camber of both right and left wheels with a suitable alignment gauge and adjust in accordance with the following procedures.

Standard value

Camber: Refer to RSU-18, "SERVICE DATA".



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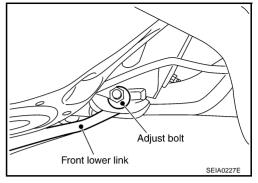
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 If outside the standard value, adjust with adjusting bolt in front lower link.

## NOTE:

After adjusting camber, be sure to check toe-in.

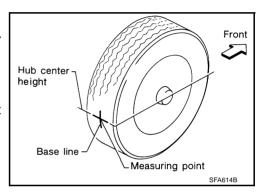


## **TOE-IN**

Measure toe-in using following procedure. If out of the specification, inspect and replace any damaged or worn rear suspension parts.

## **WARNING:**

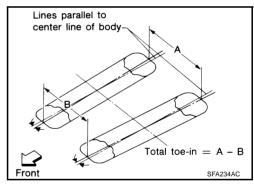
- Always perform following procedure on a flat surface.
- Make sure that no person is in front of vehicle before pushing it.
- 1. Bounce rear of vehicle up and down to stabilize the posture.
- 2. Push vehicle straight ahead about 5 m (16 ft).
- 3. Put a mark on base line of the tread (rear side) of both tires at the same height of hub center. These are measuring point.
- 4. Measure distance "A" (rear side).



- 5. Push vehicle slowly ahead to rotate the wheels 180 degrees (1/2 turn).
  - If 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).

## Standard value

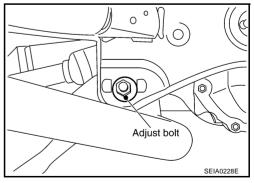
Total toe-in : Refer to RSU-18, "SERVICE DATA".

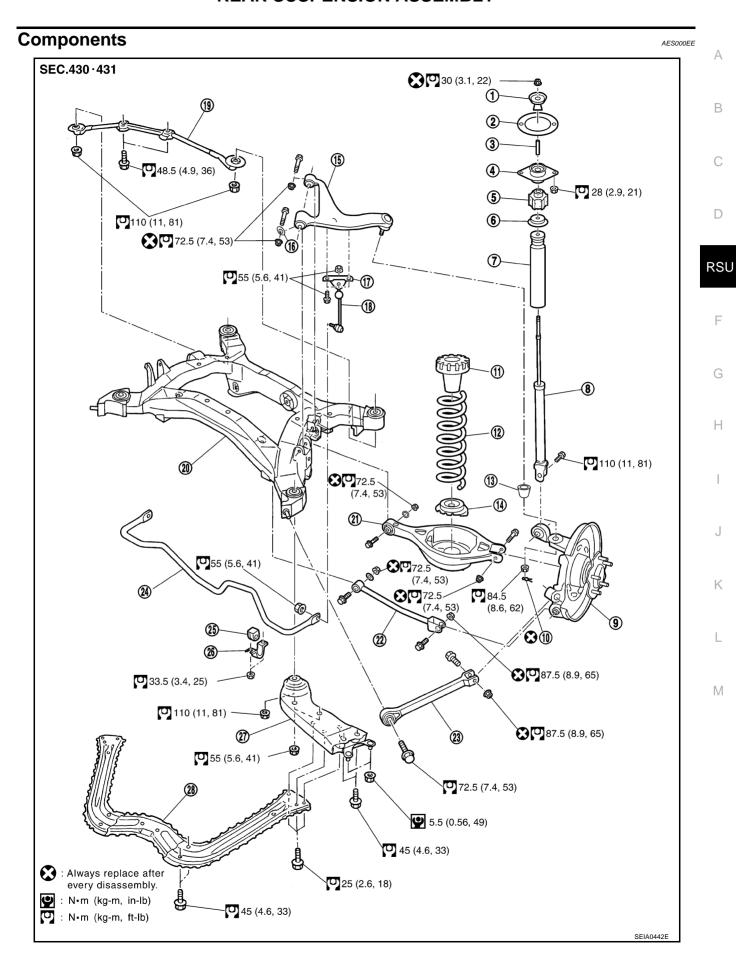


7. If outside the standard value, adjust with adjusting bolt in rear lower link.

## **CAUTION:**

Be sure to adjust equally on RH and LH side with adjusting bolt.





RSU-7

1.	Bushing	2.	Mounting seal	3.	Distance tube
4.	Mounting seal bracket	5.	Bushing	6.	Bound bumper cover
7.	Bound bumper	8.	Shock absorber	9.	Axle
10.	Cotter pin	11.	Upper seat	12.	Coil spring
13.	Ball seat	14.	Rubber seat	15.	Suspension arm
16.	Stopper rubber	17.	Stabilizer connecting rod mounting bracket	18.	Stabilizer connecting rod
19.	Rear pin stay	20.	Rear suspension member	21.	Rear lower link
22.	Front lower link	23.	Radius rod	24.	Stabilizer bar
25.	Stabilizer bushing	26.	Stabilizer clamp	27.	Member stay
28.	Tunnel stay				

# Removal and Installation REMOVAL

AFS000FH

- 1. Remove tire from vehicle with power tool.
- 2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to <u>BR-37</u>, "REAR DISC BRAKE (AD14VE TYPE)", <u>BR-43</u>, "REAR DISC BRAKE (OPB13VB TYPE)".

#### NOTE:

Avoid depressing brake pedal while brake caliper is removed.

- 3. Remove disc rotor.
- 4. Remove stabilizer bar. Refer to RSU-16, "STABILIZER BAR".
- 5. Remove rear exhaust tube. Refer to EX-3, "EXHAUST SYSTEM".
- 6. Remove propeller shaft. Refer to PR-4, "REAR PROPELLER SHAFT".
- 7. Separate the attachment between parking brake cable and vehicle and rear suspension member. Refer to PB-5, "PARKING BRAKE CONTROL".
- 8. Remove wheel sensor from rear final drive. Refer to BRC-61, "WHEEL SENSORS".
- 9. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING" .
- 10. Remove fixing nuts in upper side of mounting seal bracket. Refer to RSU-9, "SHOCK ABSORBER".
- 11. Set jack under rear final drive.
- 12. Remove tunnel stay and member stay from vehicle.
- 13. Remove fixing bolts and nuts of rear pin stay and then remove rear pin stay from vehicle.
- 14. Gradually lowering jack, remove rear suspension assembly.

## **INSTALLATION**

Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

#### NOTE

Refer to component parts location and do not reuse non-reusable parts.

Perform final tightening of installation position of links (rubber bushing) under unladen condition with tires
on level ground. Check wheel alignment. Refer to RSU-5, "Wheel Alignment Inspection".

## SHOCK ABSORBER

SHOCK ABSORBER

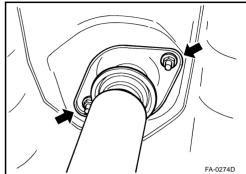
# Removal and Installation **REMOVAL**

AFS000FI

PFP:56210

1. Remove tire from vehicle with power tool.

- 2. Set jack under rear lower link.
- 3. Remove fixing bolt in lower side of shock absorber assembly with power tool.
- Remove mounting seal bracket fixing nuts of shock absorber upper side with power tool and remove shock absorber from vehicle.



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## INSPECTION AFTER REMOVAL

- Check shock absorber assembly for deformation, cracks, damage, and replace if necessary.
- Check piston rod for damage, uneven wear, distortion, and replace if necessary.
- Check welded and sealed areas for oil leakage, and replace if necessary.

## INSTALLATION

Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

Refer to component parts location and do not reuse non-reusable parts.

Perform final tightening of shock absorber assembly lower side (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA".

## **Disassembly and Assembly** DISASSEMBLY

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## **CAUTION:**

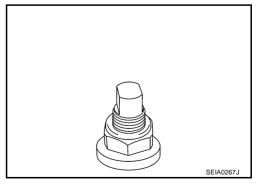
Make sure piston rod on shock absorber is not damaged when removing components from shock absorber.

- 1. Remove mounting seal from mounting seal bracket.
- 2. Wrap a shop cloth around lower side of shock absorber and fix it in a vise.

## **CAUTION:**

Do not set the cylindrical part of shock absorber in vice.

- 3. Secure piston rod tip so that piston rod does not turn, and remove piston rod lock nut.
- Remove bushing (Upper side), distance tube, mounting seal bracket, bushing (Lower side), bound bumper cover and bound bumper from shock absorber.



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RSU-9

# **SHOCK ABSORBER**

## **INSPECTION AFTER DISASSEMBLY**

# **Bound Bumper and Bushing**

Check bound bumper and bushing for cracks, deformation or other damage. Replace if necessary.

## **ASSEMBLY**

Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

## NOTE:

Refer to component parts location and do not reuse non-reusable parts.

#### CAUTION

Make sure piston rod on shock absorber is not damaged when attaching components to shock absorber.

# SUSPENSION ARM

SUSPENSION ARM PFP:55501

# Removal and Installation

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**REMOVAL** 

- 1. Remove tire from vehicle with power tool.
- 2. Remove drive shaft. Refer to RAX-10, "REAR DRIVE SHAFT".
- 3. Remove fixing nuts and bolts between suspension arm and rear suspension member.
- 4. Remove cotter pin of suspension arm ball joint, and loosen nut.
- 5. Use a ball joint remover (suitable tool) to remove suspension arm from axle. Be careful not to damage ball joint boot.

**CAUTION:** 

Tighten temporarily mounting nut to prevent damage to threads and to prevent ball joint remover (suitable tool) from coming off.

6. Remove suspension arm and stopper rubber from vehicle.

## **INSPECTION AFTER REMOVAL**

## **Visual Inspection**

- Check suspension arm and bushing for deformation, cracks, or damage. If any non-standard condition is found, replace it.
- Check boot of ball joint for cracks, or damage, and also for grease leakage.

# **Ball Joint Inspection**

Manually move ball stud to confirm it moves smoothly with no binding.

# **Swing Torque Inspection**

## NOTE:

Before measuring, move ball joint at least ten times by hand to check for smooth movement.

 Hook spring scale at cotter pin mounting hole. Confirm spring scale measurement value is within the specifications when ball stud begins moving.

Standard value

Swing torque:

0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)

Measured value of spring scale:

8.06 - 54.8 N (0.83 - 5.5 kg, 1.81 - 12.32 lb)

 If it is outside the specified range, replace suspension arm assembly.

# **Rotating Torque Inspection**

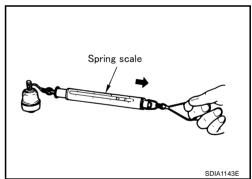
 Attach mounting nut to ball stud. Check that rotating torque is within the specifications with a preload gauge (SST).

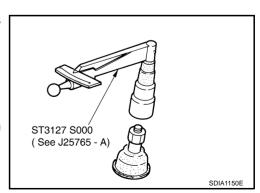
Standard value

**Rotating torque:** 

0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)

 If it is outside the specified range, replace suspension arm assembly.





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# SUSPENSION ARM

# **Axial End Play Inspection**

Move tip of ball joint in axial direction to check for looseness.

Standard value

Axial end play : 0 mm (0 in)

• If it is outside the specified range, replace suspension arm assembly.

## **INSTALLATION**

• Refer to <u>RSU-7</u>, "Components" for tightening torque. Install in the reverse order of removal.

## NOTE:

Refer to component parts location and do not reuse non-reusable parts.

 Perform final tightening of rear suspension member installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to <u>RSU-18</u>, "<u>SERVICE DATA</u>".

## **RADIUS ROD**

**RADIUS ROD** PFP:55110 Α Removal and Installation AFS000FL **REMOVAL** Remove tire from vehicle with power tool. В 2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-37, "REAR DISC BRAKE (AD14VE TYPE)", BR-43, "REAR DISC BRAKE (OPB13VB TYPE)". NOTE: С Avoid depressing brake pedal while brake caliper is removed. 3. Remove fixing bolt and nut in axle side of radius rod with power tool. Remove rear lower link and coil spring, Refer to RSU-15, "REAR LOWER LINK & COIL SPRING". D Remove fixing bolt in lower side of shock absorber with power tool. Refer to RSU-9, "SHOCK ABSORBER". 6. Remove fixing bolt and nut in axle side of front lower link with power tool. Refer to RSU-14, "FRONT RSU LOWER LINK". Remove fixing bolt in rear suspension member side of radius rod with power tool, then remove radius rod from vehicle. F INSPECTION AFTER REMOVAL Check radius rod and bushing for any deformation, cracks, or damage. Replace if necessary. INSTALLATION Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal. NOTE: Н Refer to component parts location and do not reuse non-reusable parts. Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA"

# FRONT LOWER LINK

## FRONT LOWER LINK

PFP:55110

# Removal and Installation REMOVAL

AES000EM

- 1. Remove tire from vehicle with power tool.
- 2. Set jack under rear lower link.
- 3. Remove fixing nut and bolt between front lower link and rear suspension member with power tool.
- 4. Remove fixing nut and bolt between front lower link and axle with power tool.
- 5. Remove front lower link from vehicle.

## **INSPECTION AFTER REMOVAL**

Check front lower link and bushing for any deformation, cracks, or damage. Replace if necessary.

## **INSTALLATION**

Refer to <u>RSU-7</u>, "Components" for tightening torque. Install in the reverse order of removal.

## NOTE:

Refer to component parts location and do not reuse non-reusable parts.

 Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to <u>RSU-18</u>, "<u>SERVICE DATA</u>"

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# **REAR LOWER LINK & COIL SPRING**

## **REAR LOWER LINK & COIL SPRING**

## PFP:551B0

# Removal and Installation REMOVAL

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- 1. Remove tire from vehicle with power tool.
- 2. Set jack under rear lower link.
- 3. Loosen fixing bolt and nut of rear lower link in side of suspension member, and then remove fixing bolt and nut in side of axle with power tool.
- 4. Slowly lower jack, then remove upper seat, coil spring and rubber sheet from rear lower link.
- 5. Remove fixing bolt and nut in side of rear suspension member to remove rear lower link with power tool.

## INSPECTION AFTER REMOVAL

Check rear lower link, bushing and coil spring for deformation, cracks, and damage. Replace rear lower link and coil spring if necessary.

## INSTALLATION

• Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

#### NOTE

Refer to component parts location and do not reuse non-reusable parts.

Check that upper seat is attached as shown in the figure.

## NOTE:

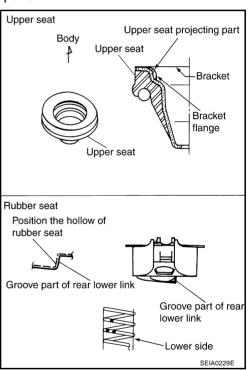
Insert bracket tabs (3) and the inside protrusion on upper seat into each other beforehand as shown in the figure.

 Match up rubber seat indentions and rear lower link grooves and attach.

## NOTE:

Make sure spring is not up side down. The top and bottom are indicated by paint color.

 Perform final tightening of rear suspension member and axle installation position (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-5, "Wheel Alignment Inspection".



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# STABILIZER BAR

STABILIZER BAR PFP:56230

# Removal and Installation REMOVAL

AES000EO

- 1. Remove fixing bolts and remove stabilizer connecting rod mount bracket from suspension arm.
- 2. Remove lower side fixing nut on stabilizer connecting rod and remove stabilizer connecting rod from stabilizer bar with power tool.
- 3. Remove fixing nut on stabilizer clamp and remove stabilizer from vehicle with power tool.

## INSPECTION AFTER REMOVAL

Check stabilizer bar, stabilizer bushings, stabilizer clamps, stabilizer connecting rod, stabilizer connecting rod mounting bracket for any deformation, crack or damage. Replace if necessary.

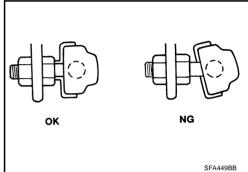
## **INSTALLATION**

• Refer to RSU-7, "Components" for tightening torque. Install in the reverse order of removal.

## NOTE:

Refer to component parts location and do not reuse non-reusable parts.

• Stabilizer bar uses pillow ball type connecting rod, position ball joint with case on pillow ball head parallel to stabilizer bar.



## **REAR SUSPENSION MEMBER**

# **REAR SUSPENSION MEMBER** PFP:55501 Α Removal and Installation AFS000FV **REMOVAL** Remove tire from vehicle with power tool. В 2. Remove brake caliper with power tool. Hang it in a place where it will not interfere with work. Refer to BR-37, "REAR DISC BRAKE (AD14VE TYPE)", BR-43, "REAR DISC BRAKE (OPB13VB TYPE)". C Avoid depressing brake pedal while brake caliper is removed. 3. Remove rear exhaust tube. Refer to EX-3, "EXHAUST SYSTEM". Remove stabilizer bar, Refer to RSU-16, "STABILIZER BAR". $\mathsf{D}$ Remove drive shaft. Refer to RAX-10, "REAR DRIVE SHAFT". Remove final drive. Refer to RFD-10, "REAR FINAL DRIVE ASSEMBLY". 7 Separate the attachment between parking brake cable and vehicle and rear suspension member. Refer to RSU PB-5, "PARKING BRAKE CONTROL". 8. Remove rear lower link and coil spring. Refer to RSU-15, "REAR LOWER LINK & COIL SPRING". 9. Remove fixing bolt in lower side of shock absorber. Refer to RSU-9, "SHOCK ABSORBER". F 10. Set jack under rear suspension member. 11. Remove fixing bolts and nuts tunnel stay and member stay from vehicle. 12. Remove fixing bolts and nuts of rear pin stay and then remove rear pin stay from vehicle. 13. Slowly lowering jack, then remove rear suspension member, suspension arm, radius rod, front lower link and axle from vehicle as a unit. Н 14. Remove fixing bolts and nuts, then remove suspension arm, front lower link, radius rod from rear suspension member. **INSPECTION AFTER REMOVAL** Check rear suspension member for deformation, cracks, and other damage and replace if necessary. INSTALLATION Refer to RSU-7, "Components", for tightening torque. Install in the reverse order of removal. NOTE: Refer to component parts location and do not reuse non-reusable parts. Perform final tightening of installation position of links (rubber bushing) under unladen condition with tires on level ground. Check wheel alignment. Refer to RSU-18, "SERVICE DATA".

# **SERVICE DATA**

SERVICE DATA PFP:00030

# **Wheel Alignment**

AES000EP

Camber Degree minute (Decimal degree)		Minimum	– 1°45′(– 1.75°)
		Nominal	- 1°15′(- 1.25°)
		Maximum	- 0°45′(- 0.75°)
Total toe-in	Distance (A - B)	Minimum	0 mm (0 in)
		Nominal	2.8 mm (0.110 in)
		Maximum	5.6 mm (0.220 in)

Ball Joint

Axial end play	0 mm (0 in)
Swing torque	0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)
Measurement on spring balance (cotter pinhole position)	8.06 - 54.8 N (0.83 - 5.5 kg, 1.81 - 12.32 lb)
Rotating torque	0.5 - 3.4 N·m (0.06 - 0.34 kg-m, 5 - 30 in-lb)

# Wheelarch Height (Unladen\*)

AES000ER



SFA818A

Applied model	225/50R17 (Front) 235/50R17 (Rear)	225/45R18 (Front) 245/45R18 (Rear)				
Front (Hf)	691 mm (27.20 in)	694 mm (27.32 in)				
Rear (Hr)	702 mm (27.64 in)	710 mm (27.95 in)				

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