

## FSU

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## **CONTENTS**

2WD (EXCEPT VR30DDTT)	TRANSVERSE LINK15
,	Exploded View15
PRECAUTION4	Removal and Installation15
PRECAUTIONS 4	Inspection and Adjustment16
Precaution for Supplemental Restraint System	UPPER LINK17
(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	Exploded View17
SIONER"4	Removal and Installation17
Precaution for Procedure without Cowl Top Cover4	Inspection and Adjustment17
Precautions for Removing Battery Terminal4	·
Precautions for Suspension5	FRONT STABILIZER19
·	Exploded View19
PREPARATION6	Removal and Installation19
PREPARATION 6	Inspection19
Special Service Tools6	FRONT SUSPENSION MEMBER20
Commercial Service Tools6	Exploded View20
Confinercial Service 10015	Removal and Installation20
SYMPTOM DIAGNOSIS7	Inspection20
NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING	SERVICE DATA AND SPECIFICATIONS (SDS)21 SERVICE DATA AND SPECIFICATIONS
I LINODIO MAINTENANOL	(SDS)21
FRONT SUSPENSION ASSEMBLY8	Wheel Alignment21
Inspection8	Ball Joint21 Wheelarch Height21
WHEEL ALIGNMENT9	2WD (VR30DDTT)
Inspection9	2WD (VK30DDTT)
Adjustment9	PRECAUTION23
·	
REMOVAL AND INSTALLATION11	PRECAUTIONS23
EDONE COUL ORDING AND CHOOK AD	Precaution for Supplemental Restraint System
FRONT COIL SPRING AND SHOCK AB-	(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-
SORBER11	SIONER"23 Precaution for Procedure without Cowl Top Cover23
Exploded View	Precautions for Removing Battery Terminal23
Removal and Installation11 Disassembly and Assembly12	Precautions for Suspension24
Inspection and Adjustment14	1 100autions for Ouspension24
Disposal 14	PREPARATION25

PREPARATION	. 25	Wheel Alignment	. 45
Special Service Tools		Ball Joint	. 46
Commercial Service Tools	. 25	Wheelarch Height	. 47
SYMPTOM DIAGNOSIS	26	AWD	
	. 20	PRECAUTION	. 49
NOISE, VIBRATION AND HARSHNESS			
(NVH) TROUBLESHOOTING		PRECAUTIONS	. 49
NVH Troubleshooting Chart	. 26	Precaution for Supplemental Restraint System	
PERIODIC MAINTENANCE	07	(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	
PERIODIC MAINTENANCE	. 27	SIONER"	
FRONT SUSPENSION ASSEMBLY	. 27	Precaution for Procedure without Cowl Top Cover.	
Inspection	. 27	Precautions for Removing Battery Terminal  Precautions for Suspension	
WHEEL ALIGNMENT	. 28	·	
		PREPARATION	. 51
EXCEPT DIRECT ADAPTIVE STEERING	. 28	PREPARATION	. 51
EXCEPT DIRECT ADAPTIVE STEERING : In-	00	Special Service Tools	
spection  EXCEPT DIRECT ADAPTIVE STEERING : Ad-	. 28	Commercial Service Tools	
justment	20		
•		SYMPTOM DIAGNOSIS	. 52
DIRECT ADAPTIVE STEERING		NOISE, VIBRATION AND HARSHNESS	
DIRECT ADAPTIVE STEERING : Inspection		(NVH) TROUBLESHOOTING	52
DIRECT ADAPTIVE STEERING : Adjustment	. 30	NVH Troubleshooting Chart	
REMOVAL AND INSTALLATION	. 31	-	
		PERIODIC MAINTENANCE	. 53
FRONT COIL SPRING AND SHOCK AB-		FRONT SUSPENSION ASSEMBLY	. 53
SORBER		Inspection	
Exploded View		•	
Removal and Installation		WHEEL ALIGNMENT	. 54
Disassembly and Assembly		EVOCET DIDECT AD A DTIVE CTEEDING	
Inspection		EXCEPT DIRECT ADAPTIVE STEERING  EXCEPT DIRECT ADAPTIVE STEERING : In-	. 54
Disposal	. 36	spection	E 1
TRANSVERSE LINK	. 37	EXCEPT DIRECT ADAPTIVE STEERING : Ad-	. 54
Exploded View		justment	55
Removal and Installation		judunoni	. 55
Inspection		DIRECT ADAPTIVE STEERING	
·		DIRECT ADAPTIVE STEERING: Inspection	
UPPER LINK		DIRECT ADAPTIVE STEERING : Adjustment	. 56
Exploded View		DEMOVAL AND INSTALLATION	
Removal and Installation		REMOVAL AND INSTALLATION	. 57
Inspection	. 39	FRONT COIL SPRING AND SHOCK AB-	
FRONT STABILIZER	. 41	SORBER	. 57
Exploded View		Exploded View	
Removal and Installation		Removal and Installation	
Inspection		Disassembly and Assembly	
·		Inspection	
FRONT SUSPENSION MEMBER		Disposal	
Exploded View		·	
Removal and Installation		TRANSVERSE LINK	
Inspection	. 43	Exploded View	
SERVICE DATA AND SPECIFICATIONS		Removal and Installation	
	AF	Inspection	. 65
(SDS)	. 45	UPPER LINK	. 67
SERVICE DATA AND SPECIFICATIONS		Exploded View	
(SDS)	. 45	Removal and Installation	

Inspection	67
FRONT STABILIZER	69
Exploded View	69
Removal and Installation	69
Inspection	70
FRONT SUSPENSION MEMBER	71
Exploded View	71
Removal and Installation	
Inspection	71

SERVICE DATA AND SPECIFICATIONS (SDS)	
SERVICE DATA AND SPECIFICATIONS (SDS)	73
Wheel Alignment	
Ball Joint	74
Wheelarch Height	74

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## **PRECAUTION**

## **PRECAUTIONS**

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

#### WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

## **WARNING:**

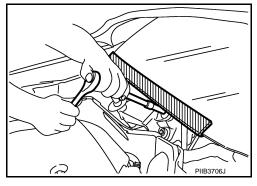
Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the
  ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with
  a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing
  serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery or batteries, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000013469515

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



## Precautions for Removing Battery Terminal

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When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- · Never disconnect battery terminal while engine is running.

## **PRECAUTIONS**

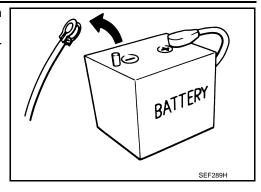
## < PRECAUTION >

## [2WD (EXCEPT VR30DDTT)]

• When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

 For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

> BR08DE : 4 minutes V9X engine : 4 minutes D4D engine : 20 minutes YD25DDTi : 2 minutes HR09DET : 12 minutes YS23DDT : 4 minutes YS23DDTT HRA2DDT : 12 minutes : 4 minutes K9K engine : 4 minutes ZD30DDTi : 60 seconds M9R engine : 4 minutes ZD30DDTT : 60 seconds R9M engine : 4 minutes



## NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

 After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

## NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- · Example of high-load driving
- Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
- Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

### NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

The removal of 12V battery may cause a DTC detection error.

## **Precautions for Suspension**

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

Unladen conditions mean 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.

Self-lock nuts are not reusable. Always use new ones when installing. Since new self-lock nuts are pre-oiled, tighten as they are.

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## **PREPARATION**

## **PREPARATION**

## **Special Service Tools**

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The actual shapes of TechMate tools may differ from those of special service tools illustrated here.

Tool number (TechMate No.) Tool name		Description
ST35652000 ( – ) Shock absorber attachment	ZZA0807D	Disassembling and assembling shock absorber
ST3127S000 (J-25765-A) Preload gauge	ZZA0806D	Measuring rotating torque of ball joint

## **Commercial Service Tools**

INFOID:0000000013469444

Tool name		Description
Power tool		Loosening bolts and nuts
	PBIC0190E	
Spring compressor		Removing and installing coil spring
	S-NT717	

## NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING [2WD (EXCEPT VR30DDTT)]

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

## NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

## **NVH Troubleshooting Chart**

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Use chart belo	ow to find the cause of the syn	nptom. If necessary, repair or rep	lace	these	part	S									
Reference		ESU-11, FSU-15, FSU-17, FSU-19, FSU-20	FSU-14		1	1	ESU-11, FSU-15, FSU-17, FSU-19, FSU-20	FSU-9	FSU-19	NVH in DLN section	NVH in FAX and FSU section	NVH in WT section	NVH in BR section	NVH in ST 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	FRONT AXLE AND FRONT SUSPENSION	ROAD WHEEL	BRAKE	STEERING	
-		Noise	×	×	×	×	×	×	_	<u> </u>	×	×	×	×	×
		Shake	×	×	×	×	_	×	_	_	×	×	×	×	×
Symptom	FRONT SUSPENSION	Vibration	×	×	×	×	×	_	_	_	×	×	_	_	×
Cymptom	TROIT GOOD LINGION	Shimmy	×	×	×	×	_	_	×	_	_	×	×	×	×
		Judder	×	×	×	_	_			_	_	×	×	×	×
	· Not applicable	Poor quality ride or handling	×	×	×	×	×	_	×	×	_	×	×	—	_

<sup>×:</sup> Applicable, —: Not applicable

## PERIODIC MAINTENANCE

## FRONT SUSPENSION ASSEMBLY

Inspection INFOID:000000013469446

### COMPONENT PART

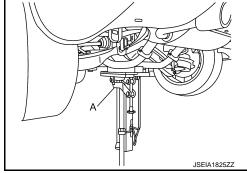
Check the mounting conditions (looseness, backlash) of each component and component conditions (wear, damage) are normal.

Ball Joint Axial End Play

## **CAUTION:**

When vertically swinging tires with the vehicle lifted, set a jack (A) to garage jack point (rear) or other position to prevent wheel separations.

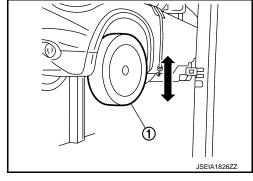
- 1. Set front wheels in a straight-ahead position.
- 2. Check ball joint boot for cracks or other damage. If there are cracks or other damage, replace transverse link.



3. Lift the vehicle and vertically swing tires ① by hand to check if the ball joint has a backlash. If it has a backlash, replace transverse link.

### NOTE:

- If a rattling noise is generated while travelling, check ball joint axial end play.
- If a roaring noise is generated while travelling, check if the wheel hub assembly bearing has a axial end play. Refer to FAX-7, "Inspection".



## Shock absorber

Check for oil leakage, damage. Replace it if necessary.

[2WD (EXCEPT VR30DDTT)]

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## WHEEL ALIGNMENT

Inspection INFOID:0000000013469447

**DESCRIPTION** 

## **CAUTION:**

- Camber, caster, kingpin inclination angles cannot be adjusted.
- If camber, caster, or kingpin inclination angle is outside the standard, check front suspension parts for wear and damage. Replace suspect parts if a malfunction is detected.
- Kingpin inclination angle is reference value, no inspection is required.

Measure wheel alignment under unladen conditions.

### NOTE:

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

### PRELIMINARY CHECK

Check the following:

- Tires for improper air pressure and wear. Refer to WT-82, "Tire Air Pressure".
- Road wheels for runout.
- Wheel bearing axial end play. Refer to FAX-7, "Inspection".
- Transverse link or upper link ball joint axial end play. Refer to FSU-8, "Inspection".
- Shock absorber operation.
- Each mounting part of axle and suspension for looseness and deformation.
- Each of suspension member, shock absorber, upper link and transverse link for cracks, deformation and other damage.
- Vehicle height (posture).

## GENERAL INFORMATION AND RECOMMENDATIONS

- A four-wheel thrust alignment should be performed.
- This type of alignment is recommended for any NISSAN/INFINITI vehicle.
- The four-wheel "thrust" process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
- The alignment rack itself should be capable of accepting any NISSAN/INFINITI vehicle.
- The rack should be checked to ensure that it is level.
- Make sure the machine is properly calibrated.
- Your alignment equipment should be regularly calibrated in order to give correct information.
- Check with the manufacturer of your specific equipment for their recommended Service/Calibration Schedule.

## ALIGNMENT PROCESS

## **IMPORTANT:**

Use only the alignment specifications listed in this Service Manual.

- When displaying the alignment settings, many alignment machines use "indicators": (Green/red, plus or minus, Go/No Go). Never use these indicators.
- The alignment specifications programmed into your machine that operate these indicators may not be correct.
- This may result in an ERROR.
- Most camera-type alignment machines are equipped with both "Rolling Compensation" method and optional "Jacking Compensation" method to "compensate" the alignment targets or head units. "Rolling Compensation" is the preferred method.
- If using the "Rolling Compensation" method, after installing the alignment targets or head units, push or pull on the rear wheel to move the vehicle. **Do not push or pull on the vehicle body.**
- If using the "Jacking Compensation" method, after installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.

#### NOTE:

Do not use the "Rolling Compensation" method if you are using sensor-type alignment equipment.

- Follow all instructions for the alignment machine you're using for more information.

Adjustment INFOID:000000013469448

TOE-IN

## WHEEL ALIGNMENT

## < PERIODIC MAINTENANCE >

[2WD (EXCEPT VR30DDTT)]

• Loosen the steering outer socket, and then adjust the length using steering inner socket.

Toe-in : Refer to FSU-21, "Wheel Alignment".

## **CAUTION:**

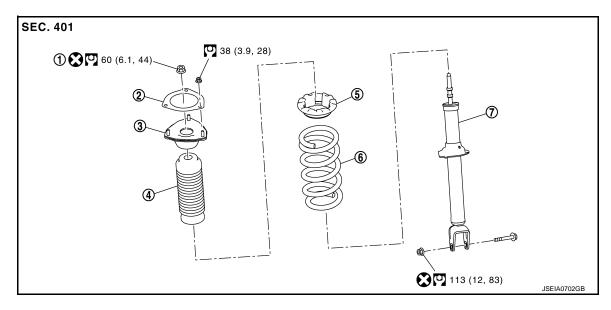
- Always evenly adjust both toe-in alternately and adjust the difference between the left and right to the standard.
- Always fix the steering inner socket when tightening the steering outer socket.
- After toe-in adjustment, adjust neutral position of steering angle sensor. Refer to BRC-91, "Description".

[2WD (EXCEPT VR30DDTT)]

## REMOVAL AND INSTALLATION

## FRONT COIL SPRING AND SHOCK ABSORBER

**Exploded View** INFOID:0000000013469490



Piston rod lock nut

Shock absorber

Mounting seal

Shock absorber mounting bracket

Bound bumper

Rubber seat

Coil spring

- : N·m (kg-m, ft-lb)
- : Always replace after every disassembly.

## Removal and Installation

INFOID:0000000013469491

## **REMOVAL**

- Remove tires with power tool. Refer to WT-74, "Exploded View".
- Remove wheel sensor harness from knuckle. Refer to BRC-191, "FRONT WHEEL SENSOR: Removal and Installation".

#### CAUTION:

## Never pull on wheel sensor harness.

- 3. Remove brake hose mounting nut, and separate brake hose from shock absorber. Refer to BR-28, "FRONT: Removal and Installation".
- Remove stabilizer connecting rod from transverse link. Refer to FSU-19, "Removal and Installation".
- Separate upper link from steering knuckle. Refer to <u>FSU-17</u>, "Removal and Installation".
- Remove shock absorber mounting bracket mounting nuts, and remove shock absorber assembly.

## INSTALLATION

Note the following, and install in the reverse order of removal.

- Never tap on the ball joint cap of the stabilizer connecting rod with a hammer or a similar item when inserting the stabilizer connecting rod into the transverse link.
- Perform final tightening of bolts and nuts at the shock absorber lower side (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to FSU-14, "Inspection and Adjustment".
- After replacing the shock absorber, always follow the disposal procedure to discard the shock absorber. Refer to FSU-14, "Disposal".

**FSU-11** Revision: November 2016 2016 Q50

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< REMOVAL AND INSTALLATION >

[2WD (EXCEPT VR30DDTT)]

Disassembly and Assembly

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## DISASSEMBLY

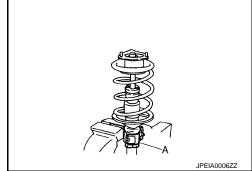
### **CAUTION:**

Never damage shock absorber piston rod when removing components from shock absorber.

1. Install shock absorber attachment [SST: ST35652000 ( — )] (A) to shock absorber and secure it in a vise.

#### **CAUTION:**

When installing the shock absorber attachment to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.



2. Using a spring compressor (commercial service tool) (A), compress coil spring between rubber seat and shock absorber until coil spring with a spring compressor is free.

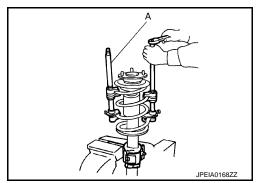
### **CAUTION:**

Be sure a spring compressor is securely attached coil spring. Compress coil spring.

 Make sure coil spring with a spring compressor between rubber seat and shock absorber is free. And then remove piston rod lock nut while securing the piston rod tip so that piston rod does not turn.

### **CAUTION:**

Start compressing the coil spring after checking that the spring compressor is completely attached.



- Remove mounting seal, shock absorber mounting bracket, rubber seat, bound bumper from shock absorber.
- After remove coil spring with a spring compressor, and then gradually release a spring compressor. CAUTION:

Loosen while making sure coil spring attachment position does not move.

- 6. Remove the shock absorber attachment from shock absorber.
- 7. Perform inspection after disassembly. Refer to FSU-14, "Inspection and Adjustment".

### ASSEMBLY

## **CAUTION:**

Never damage shock absorber piston rod when installing components from shock absorber.

- 1. Install shock absorber attachment [SST: ST35652000 ( )] to shock absorber and secure it in a vise. **CAUTION:** 
  - When installing the shock absorber attachment to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.
- 2. Compress coil spring using a spring compressor (commercial service tool), and install it onto shock absorber.

**CAUTION:** 

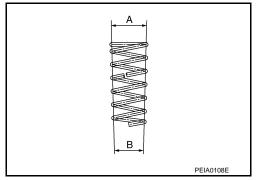
## < REMOVAL AND INSTALLATION >

[2WD (EXCEPT VR30DDTT)]

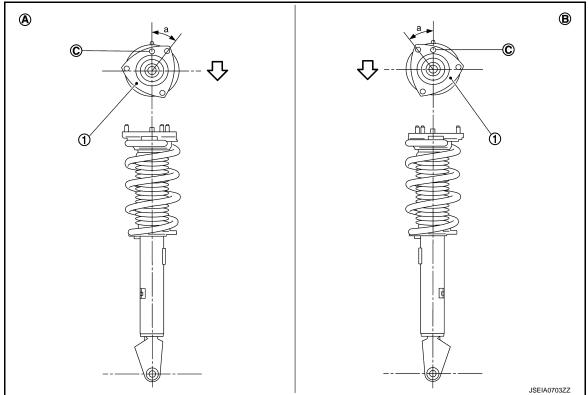
- Install with the large-diameter side (A) facing up and the small-diameter side (B) facing down.
- · Be sure a spring compressor is securely attached to coil spring. Compress coil spring.
- Install the shock absorber mounting bracket and rubber seat. 3.
- Apply soapy water to bound bumper.

### **CAUTION:**

Never use machine oil.



Insert bound bumper into shock absorber mounting bracket, and then install it to shock absorber together with rubber seat.



- (1) Shock absorber mounting bracket
- (A) Right side

(B) Left side

© Coil spring lower end position

: Vehicle front

Install the shock absorber mounting bracket as shown in the figure.

Angle (a) : 35.4°

- Check that the lower end of the coil spring © is positioned at the spring lower seat of the shock absorber.
- 6. Secure piston rod tip so that piston rod does not turn, then tighten piston rod lock nut with specified torque.

## **CAUTION:**

Never reuse piston rod lock nut.

Gradually release a spring compressor, and remove coil spring.

## **CAUTION:**

Loosen while making sure coil spring attachment position does not move.

- 8. Remove the shock absorber attachment from shock absorber.
- Install the mounting seal to shock absorber mounting bracket.

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< REMOVAL AND INSTALLATION >

[2WD (EXCEPT VR30DDTT)]

## Inspection and Adjustment

INFOID:0000000013469493

## INSPECTION AFTER DISASSEMBLY

Shock absorber

Check the following items, and replace the part if necessary.

- Shock absorber for deformation, cracks or damage.
- Piston rod for damage, uneven wear or distortion.
- · Oil leakage.

Shock absorber Mounting Bracket and Rubber Parts Inspection

Check shock absorber mounting bracket for cracks and rubber parts for wear. Replace it if necessary.

## Coil Spring

Check coil spring for cracks, wear or damage. Replace it if necessary.

## INSPECTION AFTER INSTALLATION

- Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR:</u> Exploded View".
- Check wheel alignment. Refer to <u>FSU-9</u>, "Inspection".
- 3. Adjust neutral position of steering angle sensor. Refer to BRC-91, "Description".

Disposal INFOID:0000000013469494

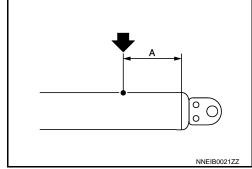
- Set shock absorber horizontally with the piston rod fully extended.
- 2. Drill 2 3 mm (0.08 0.12 in) hole at the position ( ) from top as shown in the figure to release gas gradually.

### **CAUTION:**

- · Wear eye protection (safety glasses).
- · Wear gloves.
- Be careful with metal chips or oil blown out by the compressed gas.

## NOTE:

- Drill vertically in this direction (
- Directly to the outer tube avoiding brackets.
- The gas is clear, colorless, odorless, and harmless.



## A: 20-30 mm (0.79-1.18 in)

3. Position the drilled hole downward and drain oil by moving the piston rod several times.

#### CAUTION

Dispose of drained oil according to the law and local regulations.

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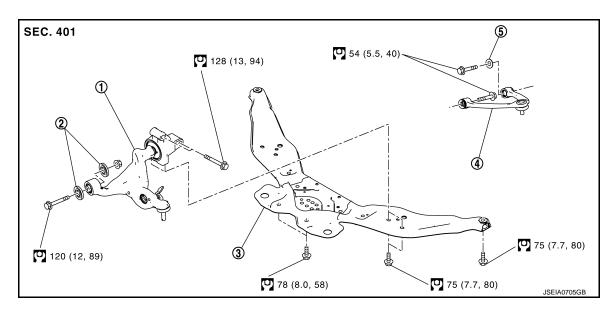
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## TRANSVERSE LINK

Exploded View



Transverse link

- Stopper bushing
- Front cross bar

Upper link

Stopper rubber

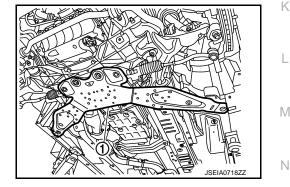
: N·m (kg-m, ft-lb)

## Removal and Installation

INFOID:0000000013469496

## **REMOVAL**

- Remove tires with power tool. Refer to <u>WT-74, "Exploded View"</u>.
- Remove engine under cover. Refer to EXT-35, "FRONT UNDER COVER: Removal and Installation".
- 3. Remove front cross bar (1).



- 4. Separate shock absorber arm from transverse link side. Refer to FSU-11, "Exploded View".
- Separate steering outer socket from steering knuckle. Refer to ST-45, "Removal and Installation".
- 6. Remove transverse link from steering knuckle. Refer to FAX-8, "Exploded View"
- 7. Set jack under steering knuckle.

## **CAUTION:**

- Check the stable condition when using a jack.
- Never damage steering knuckle with a jack.
- 8. Remove mounting bolts, nuts, and stopper bushings, and then remove transverse link from suspensionand vehicle.
- 9. Perform inspection after removal. Refer to FSU-16, "Inspection and Adjustment".

## INSTALLATION

## TRANSVERSE LINK

## < REMOVAL AND INSTALLATION >

[2WD (EXCEPT VR30DDTT)]

Note the following, and install in the reverse order of removal.

- Never tap on the ball joint cap of the stabilizer connecting rod with a hammer or a similar item when inserting
  the stabilizer connecting rod into the transverse link.
- Perform final tightening of bolts and nuts at the front suspension member installation and shock absorber lower side (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to <u>FSU-16</u>, "Inspection and Adjustment".

## Inspection and Adjustment

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## **INSPECTION AFTER REMOVAL**

## **Appearance**

Check the following items, and replace the part if necessary.

- Transverse link for deformation, cracks or damage.
- Check the bushing for complete separation. (If completely separated, inner metal can be pulled out from transverse link.)
- Ball joint boot for cracks or other damage, and also for grease leakage.

## **Ball Joint Inspection**

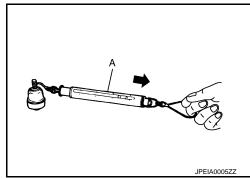
Manually move ball stud to confirm it moves smoothly with no binding.

## Swing Torque Inspection

- 1. Move the ball stud at least ten times by hand to check for smooth movement.
- 2. Hook a spring balance (A) at cotter pin mounting hole. Confirm spring balance measurement value is within specifications when ball stud begins moving.



 If swing torque exceeds standard range, replace transverse link assembly.

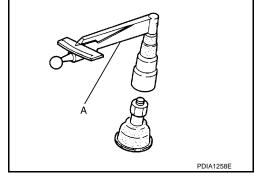


## **Rotating Torque Inspection**

- Move the ball stud at least ten times by hand to check for smooth movement.
- 2. Attach mounting nut to ball stud. Make sure that rotating torque is within specifications with a preload gauge [SST: ST3127S000 (J-25765-A)] (A).

Rotating toque : Refer to <u>FSU-21</u>, "Ball Joint".

 If rotating torque exceeds standard range, replace transverse link assembly.



## Axial End Play Inspection

- Move the ball stud at least ten times by hand to check for smooth movement.
- Move tip of ball stud in axial direction to check for looseness.
- If there is axial end play, replace transverse link assembly.

## INSPECTION AFTER INSTALLATION

- Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR: Exploded View"</u>.
- 2. Check wheel alignment. Refer to FSU-9. "Inspection".
- Adjust neutral position of steering angle sensor. Refer to <u>BRC-91, "Description"</u>.

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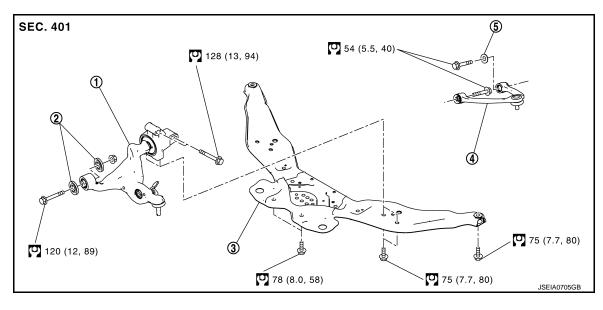
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## **UPPER LINK**

Exploded View



1 Transverse link

- Stopper bushing

Upper link

Stopper rubber

: N·m (kg-m, ft-lb)

Removal and Installation

REMOVAL

- Remove tires with power tool. Refer to <u>WT-74, "Exploded View"</u>.
   Remove shock absorber. Refer to <u>FSU-11, "Removal and Installation"</u>.
- 3. Remove mounting bolts and stopper rubber, and then remove upper link from vehicle.
- 4. Perform inspection after removal. Refer to FSU-17, "Inspection and Adjustment".

## INSTALLATION

Note the following, and install in the reverse order of removal.

- Perform final tightening of bolts and nuts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to FSU-17, "Inspection and Adjustment".

## Inspection and Adjustment

## INSPECTION AFTER REMOVAL

**Appearance** 

Check the following items, and replace the part if necessary.

- Upper link and bushing for deformation, cracks or damage.
- Ball joint boot for cracks or other damage, and also for grease leakage.

**Ball Joint Inspection** 

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

Swing Torque Inspection

Move the ball stud at least ten times by hand to check for smooth movement.

Front cross bar

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## **UPPER LINK**

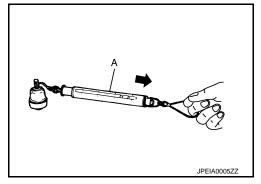
## < REMOVAL AND INSTALLATION >

## [2WD (EXCEPT VR30DDTT)]

 Hook a spring balance (A) at cutout on ball stud. Confirm spring balance measurement value is within specifications when ball stud begins moving.

Swing torque : Refer to FSU-21, "Ball Joint".

If swing torque exceeds standard range, replace upper link assembly.



## Axial End Play Inspection

- 1. Move the ball stud at least ten times by hand to check for smooth movement.
- 2. Move tip of ball stud in axial direction to check for looseness.
- If there is axial end play, replace upper link assembly.

## INSPECTION AFTER INSTALLATION

- 1. Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR: Exploded View".</u>
- 2. Check wheel alignment. Refer to FSU-9, "Inspection".
- 3. Adjust neutral position of steering angle sensor. Refer to BRC-91, "Description".

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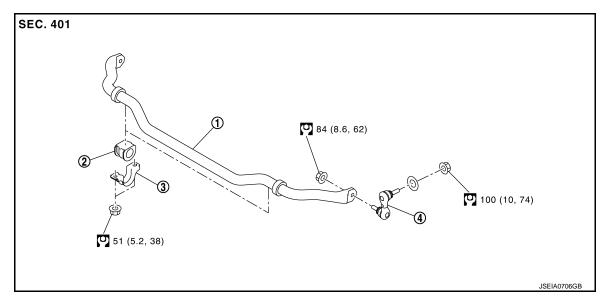
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## FRONT STABILIZER

Exploded View



Stabilizer bar

- Stabilizer bushing
- Stabilizer clamp

Stabilizer connecting rod

: N·m (kg-m, ft-lb)

## Removal and Installation

REMOVAL

- Remove tires with power tool. Refer to <u>WT-74, "Exploded View"</u>.
- 2. Remove engine under cover. Refer to EXT-35, "FRONT UNDER COVER: Removal and Installation".
- 3. Remove stabilizer connecting rods.

### **CAUTION:**

Apply a matching mark to identify the installation position.

- 4. Remove stabilizer clamps and stabilizer bushings.
- 5. Remove stabilizer bar.
- 6. Perform inspection after removal. Refer to FSU-19, "Inspection".

## **INSTALLATION**

Note the following, and install in the reverse order of removal.

- Check the matching mark when installing.
- Tighten the mounting nut to the specified torque while holding a hexagonal part of stabilizer connecting rod side.

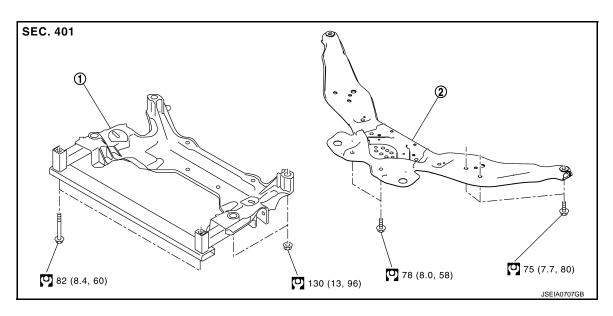
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## INSPECTION AFTER REMOVAL

Check stabilizer bar, stabilizer connecting rod, stabilizer bushing and stabilizer clamp for deformation, cracks or damage. Replace it if necessary.

## FRONT SUSPENSION MEMBER

Exploded View



- (1) Front suspension member
- Front cross bar

- : N-m (kg-m, ft-lb)
- : Always replace after every disassembly.

## Removal and Installation

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### REMOVAL

- 1. Remove tires with power tool. Refer to WT-74, "Exploded View".
- 2. At first, remove the engine and the transmission assembly with front suspension member downward. Then separate the engine, transmission. Refer to <a href="EM-102">EM-102</a>, "Removal and Installation".
- 3. Remove the following parts.
  - Steering knuckle and wheel hub and bearing assembly: Refer to FAX-8, "Exploded View".
  - Stabilizer bar and stabilizer connecting rod: Refer to FSU-19, "Exploded View".
  - Transverse link: Refer to FSU-15, "Exploded View".

### INSTALLATION

Note the following, and install in the reverse order of removal.

- Perform final tightening of bolts and nuts at the vehicle installation position (rubber bushing), under unladen condition with tires on level ground.
- Perform inspection after installation. Refer to FSU-20, "Inspection".

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## INSPECTION AFTER REMOVAL

Check the front suspension member for significant deformation, cracks, or damages. Replace if necessary.

## INSPECTION AFTER INSTALLATION

- Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR: Exploded View"</u>.
- 2. Check wheel alignment. Refer to FSU-9, "Inspection".
- Adjust neutral position of steering angle sensor. Refer to <u>BRC-91, "Description"</u>.

## **SERVICE DATA AND SPECIFICATIONS (SDS)**

< SERVICE DATA AND SPECIFICATIONS (SDS)

[2WD (EXCEPT VR30DDTT)]

# SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Wheel Alignment

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### WARNING:

If the vehicle is equipped with the ICC system and the rear toe has been adjusted during a wheel alignment, the ICC sensor must be aligned. Refer to CCS-114, "TYPE 1 : Description" (TYPE 1) or CCS-118, <u>"TYPE 2 : Description"</u> (TYPE 2).

Item		Standard	
Camber Degree minute (Decimal degree)		Minimum	-1° 20′ (-1.33°)
		Nominal	-0° 35′ (-0.58°)
		Maximum	0° 10′ (0.16°)
		Left and right difference	0° 30′ (0.50°) or less
		Minimum	3° 00′ (3.00°)
Caster		Nominal	4° 20′ (4.33°)
Degree minute (Decimal degree)		Maximum	5° 40′ (5.66°)
		Left and right difference	0° 30′ (0.50°) or less
		Minimum	6° 45′ (6.75°)
	inclination minute (Decimal degree)	Nominal	7° 30′ (7.50°)
D09.00 .	militae (Beelmai degree)	Maximum	8° 15′ (8.25°)
		Minimum	0 mm (0.00 in)
	Total toe-in Distance	Nominal	In 2 mm (In 0.08 in)
Toe-in	Distance	Maximum	In 4 mm (In 0.16 in)
		Minimum	0° 00′ (0.00°)
	Total toe angle Degree minute (Decimal Degree)	Nominal	In 0° 10′ (In 0.17°)
	2-13. 33a.a (2-35a. 2-09100)	Maximum	In 0° 20′ (In 0.33°)

Measure value under unladen\* conditions.

**Ball Joint** INFOID:0000000013469508

Item		Standard
Swing torque	Transverse link	0.5 − 3.6 N·m (0.06 − 0.36 kg-m, 5 − 31 in-lb)
Swing torque	Upper link	0 − 2.0 N·m (0 − 0.20 kg-m, 0 − 17 in-lb)
Magaziroment en enring belance	Transverse link	7.8 – 56.3 N (0.8 – 5.7 kg, 1.8 – 12.6 lb)
Measurement on spring balance	Upper link	0 – 61.5 N (0 – 6.2 kg, 0 – 13.8 lb)
Rotating torque Transverse link		0.5 − 3.9 N·m (0.06 − 0.39 kg-m, 5 − 34 in-lb)
Axial end play		0 mm (0 in)

## Wheelarch Height

Item	Standard
Front (Hf)	716 mm (28.19 in)

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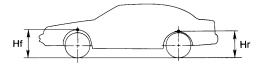
<sup>\*:</sup> Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

## **SERVICE DATA AND SPECIFICATIONS (SDS)**

< SERVICE DATA AND SPECIFICATIONS (SDS)

[2WD (EXCEPT VR30DDTT)]

Item	Standard
Rear (Hr)	708 mm (27.87 in)



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Measure value under unladen\* conditions

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

< PRECAUTION > [2WD (VR30DDTT)]

## **PRECAUTION**

## **PRECAUTIONS**

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

#### WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

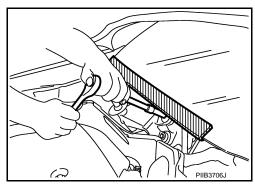
## **WARNING:**

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the
  ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with
  a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing
  serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery or batteries, and wait at least 3 minutes before performing any service.

## Precaution for Procedure without Cowl Top Cover

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



## Precautions for Removing Battery Terminal

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.

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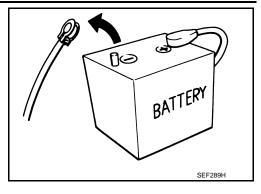
## **PRECAUTIONS**

< PRECAUTION > [2WD (VR30DDTT)]

 When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

 For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

> BR08DE : 4 minutes V9X engine : 4 minutes : 20 minutes YD25DDTi D4D engine : 2 minutes HR09DET : 12 minutes YS23DDT : 4 minutes HRA2DDT : 12 minutes YS23DDTT : 4 minutes K9K engine : 4 minutes ZD30DDTi : 60 seconds M9R engine : 4 minutes ZD30DDTT : 60 seconds R9M engine : 4 minutes



### NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

 After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

### NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
- Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
- Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

## NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

#### NOTE:

The removal of 12V battery may cause a DTC detection error.

## **Precautions for Suspension**

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- When installing rubber bushings, the final tightening must be carried out under unladen conditions with tires on ground. Spilled oil might shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean 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.
- Self-lock nuts are not reusable. Always use new ones when installing. Since new self-lock nuts are pre-oiled, tighten as they are.

[2WD (VR30DDTT)] < PREPARATION >

## **PREPARATION**

## **PREPARATION**

# Special Service Tools

The actual shapes of TechMate tools may differ from those of special service tools illustrated here.

Tool number (TechMate No.) Tool name		Description
ST35652000 ( – ) Shock absorber attachment	ZZA0807D	Disassembling and assembling shock absorber
ST3127S000 (J-25765-A) Preload gauge	ZZA0806D	Measuring rotating torque of ball joint

## **Commercial Service Tools**

Tool name		Description
Power tool		Loosening bolts and nuts
	PBIC0190E	
Spring compressor		Removing and installing coil spring
	S-NT717	

**FSU-25** Revision: November 2016 2016 Q50

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## NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING [2WD (VR30DDTT)]

< SYMPTOM DIAGNOSIS >

## SYMPTOM DIAGNOSIS

## NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

## **NVH Troubleshooting Chart**

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Jse chart bei	ow to find the cause of the syr	nptom. If necessary, repair or rep	ace t	these	parts	3.									
Reference  Possible cause and SUSPECTED PARTS		ESU-31, FSU-37, FSU-39, FSU-41, FSU-43	FSU-35	I	1	FSU-35	ESU-31, ESU-37, ESU-39, ESU-41, ESU-43	FSU-45	FSU-42	NVH in DLN section	NVH in FAX and FSU section	NVH in WT section	NVH in BR section	NVH in ST section	
		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	FRONT AXLE AND FRONT SUSPENSION	ROAD WHEEL	BRAKE	STEERING	
Symptom	FRONT SUSPENSION	Noise	×	×	×	×	×	×	_	_	×	×	×	×	×
		Shake	×	×	×	×	_	×	_	_	×	×	×	×	×
		Vibration	×	×	×	×	×	_	_	_	×	×	_	-	×
		Shimmy	×	×	×	×	_	_	×	_	_	×	×	×	×
		Judder	×	×	×	_	_	_	_	_	_	×	×	×	×
		Poor quality ride or handling	×	×	×	×	×		×	×		×	×		i

<sup>×:</sup> Applicable, —: Not applicable

[2WD (VR30DDTT)]

## PERIODIC MAINTENANCE

## FRONT SUSPENSION ASSEMBLY

Inspection INFOID:0000000012791544

### COMPONENT PART

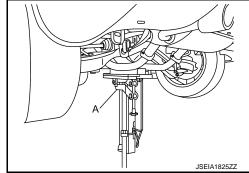
Check the mounting conditions (looseness, backlash) of each component and component conditions (wear, damage) are normal.

Ball Joint Axial End Play

## **CAUTION:**

When vertically swinging tires with the vehicle lifted, set a jack (A) to garage jack point (rear) or other position to prevent wheel separations.

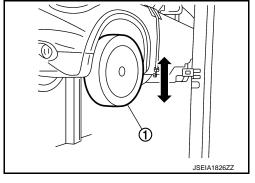
- 1. Set front wheels in a straight-ahead position.
- 2. Check ball joint boot for cracks or other damage. If there are cracks or other damage, replace transverse link.



3. Lift the vehicle and vertically swing tires ① by hand to check if the ball joint has a backlash. If it has a backlash, replace transverse link.

### NOTE:

- If a rattling noise is generated while travelling, check ball joint axial end play.
- If a roaring noise is generated while travelling, check if the wheel hub assembly bearing has a axial end play. Refer to FAX-7, "Inspection".



## Shock absorber

Check for oil leakage, damage. Replace it if necessary.

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[2WD (VR30DDTT)]

# WHEEL ALIGNMENT EXCEPT DIRECT ADAPTIVE STEERING

## **EXCEPT DIRECT ADAPTIVE STEERING: Inspection**

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### DESCRIPTION

## **CAUTION:**

- Camber, caster, kingpin inclination angles cannot be adjusted.
- If camber, caster, or kingpin inclination angle is outside the standard, check front suspension parts for wear and damage. Replace suspect parts if a malfunction is detected.
- · Kingpin inclination angle is reference value, no inspection is required.

Measure wheel alignment under unladen conditions.

### NOTE:

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

## PRELIMINARY CHECK

Check the following:

- Tires for improper air pressure and wear. Refer to WT-82, "Tire Air Pressure".
- Road wheels for runout.
- Wheel bearing axial end play. Refer to <u>FAX-7</u>, "Inspection".
- Transverse link or upper link ball joint axial end play. Refer to <u>FSU-27</u>, "Inspection".
- Shock absorber operation.
- Each mounting part of axle and suspension for looseness and deformation.
- Each of suspension member, shock absorber, upper link and transverse link for cracks, deformation and other damage.
- · Vehicle height (posture).

## GENERAL INFORMATION AND RECOMMENDATIONS

- A four-wheel thrust alignment should be performed.
- This type of alignment is recommended for any NISSAN/INFINITI vehicle.
- The four-wheel "thrust" process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
- The alignment rack itself should be capable of accepting any NISSAN/INFINITI vehicle.
- The rack should be checked to ensure that it is level.
- Make sure the machine is properly calibrated.
- Your alignment equipment should be regularly calibrated in order to give correct information.
- Check with the manufacturer of your specific equipment for their recommended Service/Calibration Schedule.

## **ALIGNMENT PROCESS**

## **IMPORTANT:**

Use only the alignment specifications listed in this Service Manual.

- When displaying the alignment settings, many alignment machines use "indicators": (Green/red, plus or minus, Go/No Go). Never use these indicators.
- The alignment specifications programmed into your machine that operate these indicators may not be correct.
- This may result in an ERROR.
- Most camera-type alignment machines are equipped with both "Rolling Compensation" method and optional "Jacking Compensation" method to "compensate" the alignment targets or head units. "Rolling Compensation" is the preferred method.
- If using the "Rolling Compensation" method, after installing the alignment targets or head units, push or pull on the rear wheel to move the vehicle. **Do not push or pull on the vehicle body.**
- If using the "Jacking Compensation" method, after installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.

### NOTE:

Do not use the "Rolling Compensation" method if you are using sensor-type alignment equipment.

Follow all instructions for the alignment machine you're using for more information.

## WHEEL ALIGNMENT

[2WD (VR30DDTT)] < PERIODIC MAINTENANCE >

## **EXCEPT DIRECT ADAPTIVE STEERING: Adjustment**

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### TOE-IN

Loosen the steering outer socket, and then adjust the length using steering inner socket.

: Refer to FSU-45, "Wheel Alignment". Toe-in

## **CAUTION:**

- Always evenly adjust both toe-in alternately and adjust the difference between the left and right to
- · Always fix the steering inner socket when tightening the steering outer socket.
- After toe-in adjustment, adjust neutral position of steering angle sensor. Refer to BRC-91, "Description".

## DIRECT ADAPTIVE STEERING

## DIRECT ADAPTIVE STEERING: Inspection

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### DESCRIPTION

### **CAUTION:**

- Always perform DAST calibration with CONSULT when adjusting the toe-in. (It cannot be adjusted without CONSULT.)
- Camber, caster, kingpin inclination angles cannot be adjusted.
- If camber, caster, or kingpin inclination angle is outside the standard, check front suspension parts for wear and damage. Replace suspect parts if a malfunction is detected.
- Kingpin inclination angle is reference value, no inspection is required.

Measure wheel alignment under unladen conditions.

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

### PRELIMINARY CHECK

Check the following:

- Tires for improper air pressure and wear. Refer to WT-82, "Tire Air Pressure".
- · Road wheels for runout.
- Wheel bearing axial end play. Refer to <u>FAX-7</u>, "Inspection".
- Transverse link or upper link ball joint axial end play. Refer to <u>FSU-27</u>, "Inspection".
- Shock absorber operation.
- Each mounting part of axle and suspension for looseness and deformation.
- Each of suspension member, shock absorber, upper link and transverse link for cracks, deformation and other damage.
- Vehicle height (posture).

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- Make sure the machine is properly calibrated.
- Your alignment equipment should be regularly calibrated in order to give correct information.
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## ALIGNMENT PROCESS

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- When displaying the alignment settings, many alignment machines use "indicators": (Green/red, plus or minus, Go/No Go). Never use these indicators.
- The alignment specifications programmed into your machine that operate these indicators may not be correct.
- This may result in an ERROR.

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## WHEEL ALIGNMENT

## < PERIODIC MAINTENANCE >

[2WD (VR30DDTT)]

- Most camera-type alignment machines are equipped with both "Rolling Compensation" method and optional "Jacking Compensation" method to "compensate" the alignment targets or head units. "Rolling Compensation" is the preferred method.
- If using the "Rolling Compensation" method, after installing the alignment targets or head units, push or pull on the rear wheel to move the vehicle. **Do not push or pull on the vehicle body.**
- If using the "Jacking Compensation" method, after installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.
   NOTE:

Do not use the "Rolling Compensation" method if you are using sensor-type alignment equipment.

- Follow all instructions for the alignment machine you're using for more information.

## **DIRECT ADAPTIVE STEERING: Adjustment**

INFOID:0000000012791548

## **CAUTION:**

Always perform DAST calibration with CONSULT when adjusting the toe-in. (It cannot be adjusted without CONSULT.)

## TOE-IN

• Proceed to <u>ST-126. "ALIGNMENT TESTER: Inspection and Adjustment"</u> (Alignment tester), <u>ST-128.</u> "EXCEPT ALIGNMENT TESTER: Inspection and Adjustment" (Except alignment tester).

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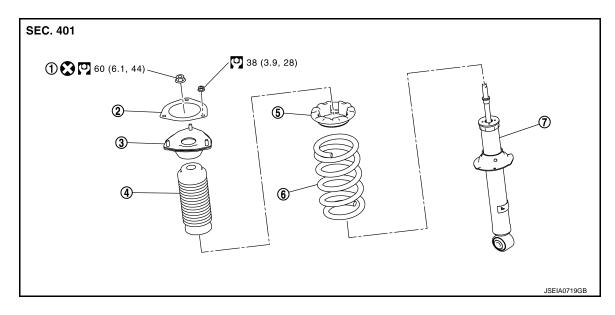
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# REMOVAL AND INSTALLATION

## FRONT COIL SPRING AND SHOCK ABSORBER

Exploded View

## WITHOUT DIGITAL MOTION CONTROL



- (1) Piston rod lock nut
- (2) Mounting seal

) Shock absorber mounting bracket

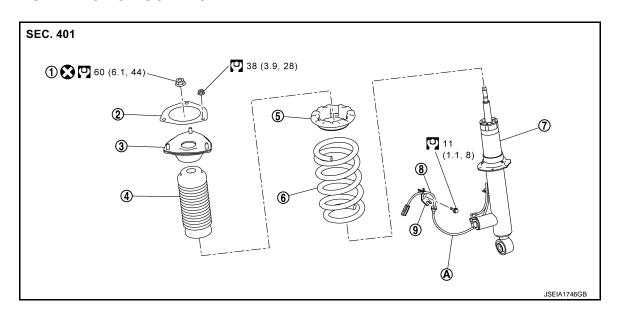
(4) Bound bumper

S Rubber seat

6) Coil spring

- (7) Shock absorber
- : N·m (kg-m, ft-lb)
- : Always replace after every disassembly.

## WITH DIGITAL MOTION CONTROL



- ① Piston rod lock nut
- ② Mounting seal

Dynamic digital suspension mounting bracket

4 Bound bumper

S Rubber seat

6 Coil spring

Revision: November 2016 FSU-31 2016 Q50

## < REMOVAL AND INSTALLATION >

[2WD (VR30DDTT)]

Opposite the contract of th

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Dynamic digital suspension harness bracket

(A) Identification line

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

## Removal and Installation

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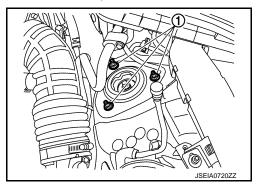
## REMOVAL

- Remove tires with power tool. Refer to <u>WT-74, "Exploded View"</u>.
- 2. Remove wheel sensor harness from steering knuckle. Refer to <u>BRC-191, "FRONT WHEEL SENSOR: Removal and Installation".</u>

## **CAUTION:**

Never pull on wheel sensor harness.

- Remove brake hose bracket from steering knuckle. Refer to <u>BR-28</u>, "<u>FRONT</u>: <u>Removal and Installation</u>".
- 4. Remove front fender protector front. (With digital motion control) Refer to <a href="EXT-30">EXT-30</a>, "FENDER PROTECTOR: Removal and Installation".
- 5. Disconnect dynamic digital suspension harness connector, and remove dynamic digital suspension harness. (With digital motion control)
- 6. Remove dynamic digital suspension harness bracket. (With digital motion control)
- Remove shock absorber mounting bracket or dynamic digital suspension mounting bracket mounting nuts ①, and remove shock absorber assembly or dynamic digital suspension assembly.



### INSTALLATION

Note the following, and install in the reverse order of removal.

### **CAUTION:**

Never tap on the ball joint cap of the stabilizer connecting rod with a hammer or a similar item when inserting the stabilizer connecting rod into the transverse link.

 Install dynamic digital suspension harness in a manner such that outward identification line out of 2 faces operator as dynamic digital suspension is fixed. (With digital motion control)
 CAUTION:

## Never twist dynamic digital suspension harness.

- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to <u>FSU-35</u>, "Inspection".
- After replacing the shock absorber or dynamic digital suspension, always follow the disposal procedure to discard the shock absorber. Refer to FSU-36, "Disposal".

## Disassembly and Assembly

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## **DISASSEMBLY**

## **CAUTION:**

Never damage shock absorber or dynamic digital suspension piston rod when removing components from shock absorber or dynamic digital suspension.

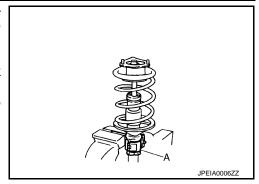
## < REMOVAL AND INSTALLATION >

[2WD (VR30DDTT)]

Install shock absorber attachment (A) [SST: ST35652000 ( – )] to shock absorber or dynamic digital suspension and secure it in a vise.

### **CAUTION:**

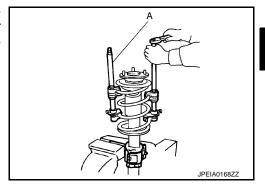
When installing the shock absorber attachment to shock absorber or dynamic digital suspension, wrap a shop cloth around shock absorber or dynamic digital suspension to protect it from damage.



 Using a spring compressor (A) (commercial service tool), compress coil spring between rubber seat and shock absorber or dynamic digital suspension until coil spring with a spring compressor is free.

## **CAUTION:**

Be sure a spring compressor is securely attached coil spring. Compress coil spring.



Make sure coil spring with a spring compressor between rubber seat and shock absorber or dynamic digital suspension is free. And then remove piston rod lock nut while securing the piston rod tip so that piston rod does not turn.

### **CAUTION:**

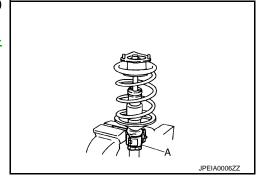
Start compressing the coil spring after checking that the spring compressor is completely attached.

- 4. Remove mounting seal, shock absorber or dynamic digital suspension mounting bracket, rubber seat, bound bumper from shock absorber or dynamic digital suspension.
- After remove coil spring with a spring compressor (commercial service tool), and then gradually release a spring compressor.

## **CAUTION:**

Loosen while making sure coil spring attachment position does not move.

- 6. Remove the shock absorber attachment (A) [SST: ST35652000 ( )] from shock absorber or dynamic digital suspension.
- 7. Perform inspection after disassembly. Refer to <u>FSU-35</u>, "Inspection".



ASSEMBLY

## **CAUTION:**

Never damage shock absorber or dynamic digital suspension piston rod when installing components from shock absorber or dynamic digital suspension.

1. Install shock absorber attachment [SST: ST35652000 ( - )] to shock absorber or dynamic digital suspension and secure it in a vise.

## **CAUTION:**

When installing the shock absorber attachment to shock absorber or dynamic digital suspension, wrap a shop cloth around shock absorber or dynamic digital suspension to protect it from damage.

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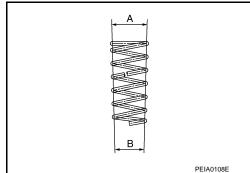
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2. Compress coil spring using a spring compressor (commercial service tool), and install it onto shock absorber or dynamic digital suspension.

## **CAUTION:**

- Install with the large-diameter side (A) facing up and the small-diameter side (B) facing down.
- Be sure a spring compressor is securely attached to coil spring. Compress coil spring.



3. Install the shock absorber mounting bracket or dynamic digital suspension mounting bracket and rubber seat.

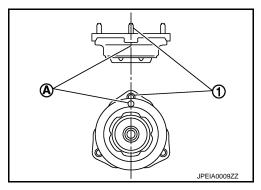
## **CAUTION:**

Align the paint mark A to the stud bolt 1 position when assembling.

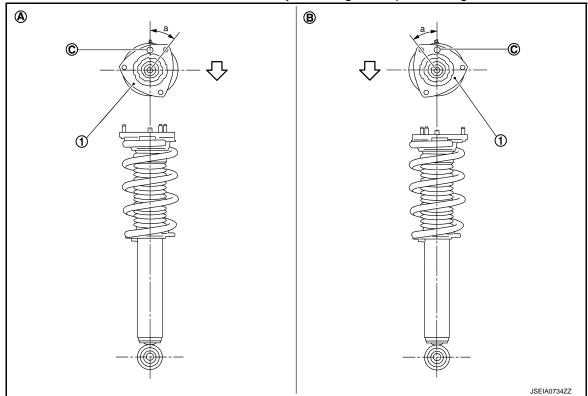
4. Apply soapy water to bound bumper.

## **CAUTION:**

Never use machine oil.



5. Insert bound bumper into shock absorber mounting bracket or dynamic digital suspension mounting bracket, and then install it to shock absorber or dynamic digital suspension together with rubber seat.



1 Dynamic digital suspension mounting bracket

(A) Right side

B Left side

© Coil spring lower end position

∀: Vehicle front

## < REMOVAL AND INSTALLATION >

[2WD (VR30DDTT)]

• Install the shock absorber mounting bracket or dynamic digital suspension mounting bracket as shown in the figure.

## Angle (a) : 35.4°

- Check that the lower end of the coil spring © is positioned at the spring lower seat of the shock absorber or dynamic digital suspension.
- 6. Secure piston rod tip so that piston rod does not turn, then tighten piston rod lock nut with specified torque.

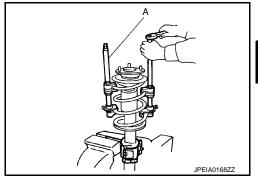
### **CAUTION:**

Never reuse piston rod lock nut.

7. Gradually release a spring compressor (A) (commercial service tool), and remove coil spring.

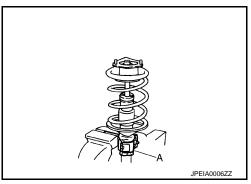
### **CAUTION:**

Loosen while making sure coil spring attachment position does not move.



8. Remove the shock absorber attachment (A) [SST: ST35652000 ( - )] from shock absorber or dynamic digital suspension.

Install the mounting seal to shock absorber mounting bracket or dynamic digital suspension mounting bracket.



Inspection INFOID:000000012791552

## INSPECTION AFTER DISASSEMBLY

Shock Absorber or Dynamic Digital Suspension

Check the following items, and replace the part if necessary.

- Shock absorber or dynamic digital suspension for deformation, cracks or damage.
- Piston rod for damage, uneven wear or distortion.
- Oil leakage.

Shock Absorber Mounting Bracket or Dynamic Digital Suspension Mounting Bracket and Rubber Parts Inspection Check shock absorber mounting bracket or dynamic digital suspension mounting bracket for cracks and rubber parts for wear. Replace it if necessary.

Coil Spring

Check coil spring for cracks, wear or damage. Replace it if necessary.

### INSPECTION AFTER INSTALLATION

- 1. Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR:</u> Exploded View".
- 2. Check wheel alignment.
  - EPS models: Refer to FSU-28, "EXCEPT DIRECT ADAPTIVE STEERING: Inspection".
  - Direct adaptive steering models: Refer to FSU-29, "DIRECT ADAPTIVE STEERING: Inspection".
- 3. Adjust neutral position of steering angle sensor. Refer to <a href="BRC-91">BRC-91</a>. "Description" (EPS models).

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< REMOVAL AND INSTALLATION >

[2WD (VR30DDTT)]

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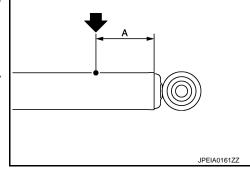
- 1. Set shock absorber or dynamic digital suspension horizontally with the piston rod fully extended.
- 2. Drill 2 − 3 mm (0.08 − 0.12 in) hole at the position ( ) from top as shown in the figure to release gas gradually.

## **CAUTION:**

- Wear eye protection (safety glasses).
- · Wear gloves.
- Be careful with metal chips or oil blown out by the compressed gas.

### NOTE:

- Drill vertically in this direction (—).
- Directly to the outer tube avoiding brackets.
- The gas is clear, colorless, odorless, and harmless.



## A: 20 – 30 mm (0.79 – 1.18 in)

3. Position the drilled hole downward and drain oil by moving the piston rod several times. CAUTION:

Dispose of drained oil according to the law and local regulations.

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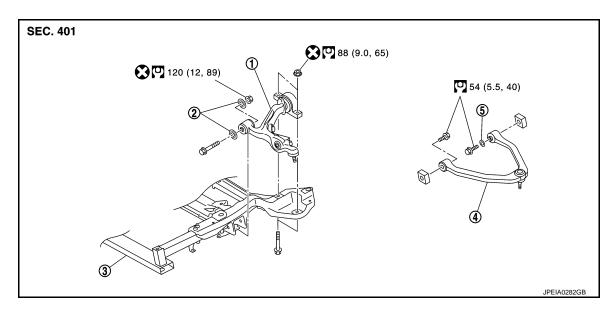
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## TRANSVERSE LINK

Exploded View



Transverse link

- Stopper bushing
- Stopper rubber

③ Front suspension member

4 Upper link∴ N⋅m (kg-m, ft-lb)

: Always replace after every disassembly.

#### Removal and Installation

INFOID:0000000012791555

#### REMOVAL

- 2. Remove engine under cover. Refer to <a href="EXT-35">EXT-35</a>, "FRONT UNDER COVER: Removal and Installation".
- Remove stabilizer connecting rod and shock absorber or dynamic digital suspension from transverse link. Refer to <u>FSU-41</u>, "<u>Removal and Installation</u>".
- 4. Separate steering outer socket from steering knuckle.
  - EPS models: Refer to <u>ST-95</u>, "Removal and Installation".
  - Direct adaptive steering models: Refer to <u>ST-146</u>, "Removal and Installation".
- Remove transverse link from steering knuckle. Refer to <u>FAX-8</u>. "Exploded View".
- Set jack under steering knuckle.

#### **CAUTION:**

- Check the stable condition when using a jack.
- Never damage steering knuckle with a jack.
- 7. Remove mounting bolts, nuts, and stopper bushing, and then remove transverse link from front suspension member.
- Perform inspection after removal. Refer to <u>FSU-38</u>, "Inspection".

#### INSTALLATION

Note the following, and install in the reverse order of removal.

- Never reuse transverse link mounting nut.
- Never tap on the ball joint cap of the stabilizer connecting rod with a hammer or a similar item when inserting
  the stabilizer connecting rod into the transverse link.
- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to <u>FSU-38</u>, "<u>Inspection</u>".

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Revision: November 2016 FSU-37 2016 Q50

[2WD (VR30DDTT)]

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#### INSPECTION AFTER REMOVAL

#### Appearance

Check the following items, and replace the part if necessary.

- Transverse link for deformation, cracks or damage.
- Check the bushing for complete separation. (If completely separated, inner metal can be pulled out from transverse link.)
- Ball joint boot for cracks or other damage, and also for grease leakage.

#### **Ball Joint Inspection**

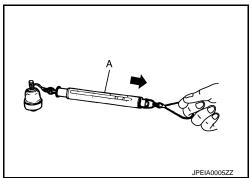
Manually move ball stud to confirm it moves smoothly with no binding.

#### **Swing Torque Inspection**

- 1. Move the ball stud at least ten times by hand to check for smooth movement.
- 2. Hook a spring balance (A) at cotter pin mounting hole. Confirm spring balance measurement value is within specifications when ball stud begins moving.

Swing toque : Refer to FSU-46, "Ball Joint".

 If swing torque exceeds standard range, replace transverse link assembly.

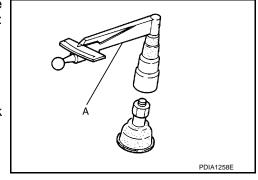


#### **Rotating Torque Inspection**

- Move the ball stud at least ten times by hand to check for smooth movement.
- Attach mounting nut to ball stud. Make sure that rotating torque is within specifications with a preload gauge (A) [SST: ST3127S000 (J-25765-A)].

Rotating toque : Refer to <u>FSU-46, "Ball</u> Joint".

 If rotating torque exceeds standard range, replace transverse link assembly.



#### Axial End Play Inspection

- 1. Move the ball stud at least ten times by hand to check for smooth movement.
- Move tip of ball stud in axial direction to check for looseness.
- If there is axial end play, replace transverse link assembly.

### INSPECTION AFTER INSTALLATION

- Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR: Exploded View"</u>.
- 2. Check wheel alignment.
  - EPS models: Refer to FSU-28, "EXCEPT DIRECT ADAPTIVE STEERING: Inspection".
  - Direct adaptive steering models: Refer to <u>FSU-29</u>, "<u>DIRECT ADAPTIVE STEERING</u>: <u>Inspection</u>".
- 3. Adjust neutral position of steering angle sensor. Refer to <a href="BRC-91">BRC-91</a>, "Description" (EPS models).

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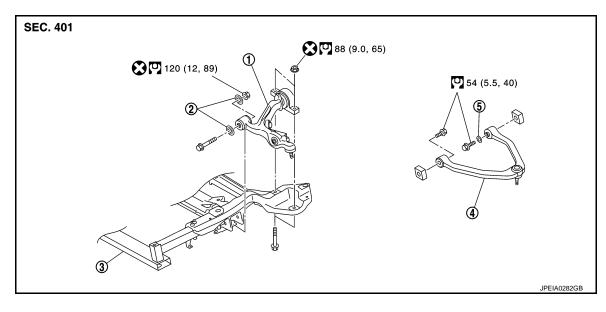
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## **UPPER LINK**

Exploded View



Transverse link

- Stopper bushing
  - 5) Stopper rubber

3 Front suspension member

- 4 Upper link
- : N·m (kg-m, ft-lb)
- : Always replace after every disassembly.

## Removal and Installation

REMOVAL

- 2. Remove upper link from steering knuckle. Refer to <a href="FAX-8">FAX-8</a>, "Exploded View".
- Remove shock absorber or dynamic digital suspension. Refer to <u>FSU-32</u>, "<u>Removal and Installation</u>".
- 4. Remove mounting bolts and stopper rubber, and then remove upper link from vehicle.
- 5. Perform inspection after removal. Refer to FSU-39, "Inspection".

#### INSTALLATION

Note the following, and install in the reverse order of removal.

- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to <u>FSU-39</u>, "Inspection".

Inspection INFOID:0000000012791559

#### INSPECTION AFTER REMOVAL

**Appearance** 

Check the following items, and replace the part if necessary.

- Upper link and bushing for deformation, cracks or damage.
- Ball joint boot for cracks or other damage, and also for grease leakage.

**Ball Joint Inspection** 

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

Swing Torque Inspection

Move the ball stud at least ten times by hand to check for smooth movement.

Revision: November 2016 FSU-39 2016 Q50

## **UPPER LINK**

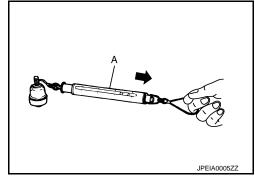
#### < REMOVAL AND INSTALLATION >

[2WD (VR30DDTT)]

 Hook a spring balance (A) at cutout on ball stud. Confirm spring balance measurement value is within specifications when ball stud begins moving.

Swing torque : Refer to FSU-46, "Ball Joint".

If swing torque exceeds standard range, replace upper link assembly.



#### Axial End Play Inspection

- 1. Move the ball stud at least ten times by hand to check for smooth movement.
- Move tip of ball stud in axial direction to check for looseness.
- If there is axial end play, replace upper link assembly.

#### INSPECTION AFTER INSTALLATION

- 1. Check wheel sensor harness for proper connection. Refer to <a href="BRC-191">BRC-191</a>, "FRONT WHEEL SENSOR: Exploded View".
- 2. Check wheel alignment.
  - EPS models: Refer to FSU-28, "EXCEPT DIRECT ADAPTIVE STEERING: Inspection".
  - Direct adaptive steering models: Refer to FSU-29, "DIRECT ADAPTIVE STEERING: Inspection".
- 3. Adjust neutral position of steering angle sensor. Refer to <a href="BRC-91">BRC-91</a>, "Description" (EPS models).

## FRONT STABILIZER

**Exploded View** 

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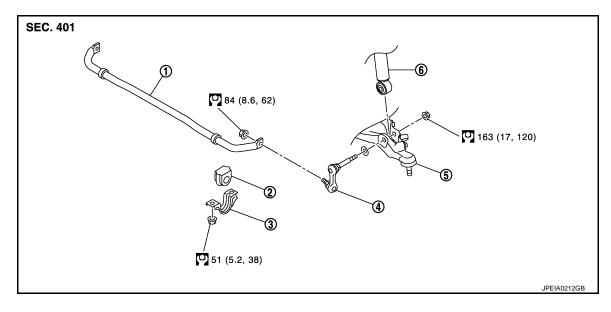
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- Stabilizer bar
- 3 Stabilizer connecting rod
- : N·m (kg-m, ft-lb)
- : Always replace after every disassembly.
- Stabilizer bushing
- Transverse link

- 3 Stabilizer clamp
- 6 Dynamic digital suspension

## Removal and Installation

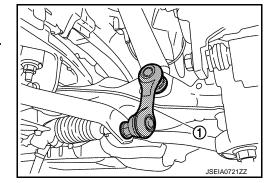
**REMOVAL** 

Remove tires with power tool. Refer to <u>WT-74, "Exploded View"</u>.

2. Remove engine under cover. Refer to EXT-35, "FRONT UNDER COVER: Removal and Installation".

3. Remove stabilizer connecting rods ①. CAUTION:

Apply a matching mark to identify the installation position.



- Remove stabilizer clamps and stabilizer bushings.
- 5. Remove stabilizer bar.
- 6. Perform inspection after removal. Refer to FSU-42, "Inspection".

#### **INSTALLATION**

Note the following, and install in the reverse order of removal.

Check the matching mark when installing.

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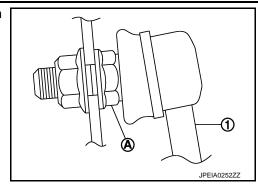
Revision: November 2016 FSU-41 2016 Q50

## FRONT STABILIZER

## < REMOVAL AND INSTALLATION >

[2WD (VR30DDTT)]

• To install stabilizer connecting rod ①, tighten the mounting nut with hexagon part (A) on the stabilizer connecting rod side fixed.



• Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.

Inspection INFOID:000000012791562

## INSPECTION AFTER REMOVAL

Check stabilizer bar, stabilizer connecting rod, stabilizer bushing and stabilizer clamp for deformation, cracks or damage. Replace it if necessary.

[2WD (VR30DDTT)]

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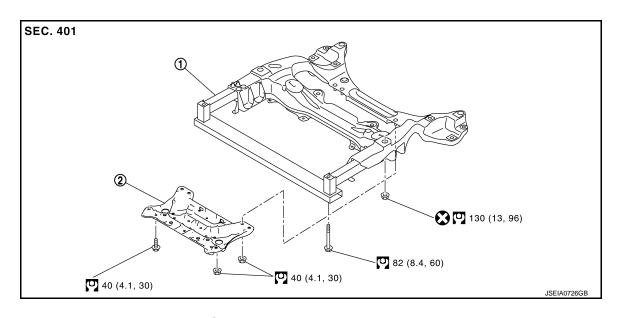
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## FRONT SUSPENSION MEMBER

Exploded View



Front suspension member

Suspension member stay

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

## Removal and Installation

REMOVAL

- 1. Remove tires with power tool. Refer to WT-74, "Removal and Installation".
- At first, remove the engine and the transmission assembly with front suspension member downward.
   Then separate the engine, transmission. Refer to <u>EM-204</u>, "2WD: Removal and Installation".
- 3. Remove the following parts.
  - Steering knuckle and wheel hub and bearing assembly: Refer to FAX-8, "Exploded View".
  - Steering gear assembly (EPS models): Refer to ST-95, "Removal and Installation".
  - Steering gear assembly (Direct adaptive steering models): Refer to <u>ST-146, "Removal and Installation"</u>.
  - Stabilizer bar and stabilizer connecting rod: Refer to FSU-41, "Exploded View".
  - Transverse link: Refer to FSU-37, "Exploded View".

#### INSTALLATION

Note the following, and install in the reverse order of removal.

- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to <u>FSU-43</u>, "Inspection".

Inspection INFOID:0000000012791565

## INSPECTION AFTER REMOVAL

Check the front suspension member for significant deformation, cracks, or damages. Replace if necessary.

#### INSPECTION AFTER INSTALLATION

- 1. Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR: Exploded View".</u>
- Check wheel alignment.
  - EPS models: Refer to FSU-28, "EXCEPT DIRECT ADAPTIVE STEERING: Inspection".
  - Direct adaptive steering models: Refer to FSU-29, "DIRECT ADAPTIVE STEERING: Inspection".

Revision: November 2016 FSU-43 2016 Q50

## **FRONT SUSPENSION MEMBER**

[2WD (VR30DDTT)]

3. Adjust neutral position of steering angle sensor. Refer to BRC-91, "Description" (EPS models).

< SERVICE DATA AND SPECIFICATIONS (SDS)

[2WD (VR30DDTT)]

# SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

Wheel Alignment

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#### **WARNING:**

If the vehicle is equipped with the ICC system and the rear toe has been adjusted during a wheel alignment, the ICC sensor must be aligned. Refer to <a href="CCS-114">CCS-114</a>, "TYPE 1: Description" (TYPE 1) or <a href="CCS-118">CCS-118</a>, "TYPE 2: Description" (TYPE 2).

**EXCEPT FOR MEXICO** 

**Except For Premium Sport Grade** 

	Item		Standard
		Minimum	-1° 10′ (-1.16°)
Camber		Nominal	-0° 25′ (-0.42°)
Degree	minute (Decimal degree)	Maximum	0° 20′ (0.33°)
		Left and right difference	0° 30′ (0.50°) or less
Caster Degree minute (Decimal degree)		Minimum	3° 15′ (3.25°)
		Nominal	4° 35′ (4.58°)
		Maximum	5° 55′ (5.91°)
		Left and right difference	0° 30′ (0.50°) or less
<i>.</i> .		Minimum	6° 40′ (6.67°)
	inclination minute (Decimal degree)	Nominal	7° 25′ (7.42°)
5, 00	(= ::a. dog.dd)	Maximum	8° 10′ (8.16°)
		Minimum	0 mm (0.00 in)
	Total toe-in Distance	Nominal	In 2 mm (In 0.08 in)
Tao in		Maximum	In 4 mm (In 0.16 in)
Гое-in	Total toe-angle Degree minute (Decimal	Minimum	0° 00′ (0.00°)
		Nominal	In 0° 10′ (In 0.17°)
	degree)	Maximum	In 0° 20′ (In 0.33°)

Measure value under unladen\* conditions.

#### For Premium Sport Grade

Item		Stand	dard				
Tire Size	Front	245/40RF19	245/40RF19				
TIFE SIZE	Rear	245/40RF19	265/35RF19				
	Minimum	−1° 05′ (	–1.08°)				
Camber Degree minute (Decimal degree)	Nominal	-0° 20′ (-0.33°)					
	Maximum	0° 25′ (0.41°)					
	Left and right difference	0° 30′ (0.50°) or less					
	Minimum	3° 20′ (3.34°)	3° 25′ (3.42°)				
Caster	Nominal	4° 40′ (4.67°)	4° 45′ (4.75°)				
Degree minute (Decimal degree)	Maximum	6° 00′ (6.00°)	6° 05′ (6.08°)				
	Left and right difference	0° 30′ (0.50°) or less					

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

## < SERVICE DATA AND SPECIFICATIONS (SDS)

[2WD (VR30DDTT)]

	Item		Standard						
Tiro Cir		Front	045/40D540	245/40RF19					
Tire Size		Rear	245/40RF19	265/35RF19					
		Minimum	6° 35′ (6.59°)						
Kingpin inclination Degree minute (Decimal degree)		Nominal	7° 20′ (7.33°)						
_ og. oo	rimiato (200mai aug.00)	Maximum	8° 05′ (8.08°)						
		Minimum	0 mm (0.00 in)						
	Total toe-in Distance	Nominal	In 2 mm (In 0.08 in)						
Toe-in	2.0.0	Maximum	In 4 mm (In 0.16 in)						
106-111	Total toe-angle	Minimum	0° 00′ (0.00°)						
	Degree minute (Decimal	Nominal	In 0° 10′ (In 0.17°)						
	degree)	Maximum	In 0° 20′ (In 0.33°)						

Measure value under unladen\* conditions.

## FOR MEXICO

	Item		Standard
		Minimum	-0° 50′ (-0.83°)
Cambe	ır	Nominal	-0° 05′ (-0.08°)
Degree	minute (Decimal degree)	Maximum	0° 40′ (0.66°)
		Left and right difference	0° 30′ (0.50°) or less
		Minimum	3° 00′ (3.00°)
Caster	Nominal	4° 20′ (4.33°)	
Degree	Degree minute (Decimal degree)	Maximum	5° 40′ (5.66°)
		Left and right difference	0° 30′ (0.50°) or less
		Minimum	6° 20′ (6.34°)
	n inclination e minute (Decimal degree)	Nominal	7° 05′ (7.08°)
_ og. oo	· ······ato (2 co·····a: acg.co)	Maximum	7° 50′ (7.83°)
		Minimum	Out 1 mm (Out 0.03 in)
	Total toe-in Distance	Nominal	In 2 mm (In 0.08 in)
Toe-in		Maximum	In 3 mm (In 0.11 in)
106-111	Total toe-angle	Minimum	Out 0° 05′ 02″ (Out 0.08°)
	Degree minute (Decimal	Nominal	In 0° 05′ 02″ (In 0.08°)
	degree)	Maximum	In 0° 15′ 07″ (In 0.25°)

Measure value under unladen\* conditions.

Ball Joint

Item		Standard						
Swing targue	Transverse link	0.5 − 3.6 N·m (0.06 − 0.36 kg-m, 5 − 31 in-lb)						
Swing torque	Upper link	0 − 2.0 N·m (0 − 0.20 kg-m, 0 − 17 in-lb)						
Magazirament en anring belance	Transverse link	7.8 – 56.3 N (0.8 – 5.7 kg, 1.8 – 12.6 lb)						
Measurement on spring balance	Upper link	0 – 61.5 N (0 – 6.2 kg, 0 – 13.8 lb)						
Rotating torque Transverse link		0.5 – 3.9 N·m (0.06 – 0.39 kg-m, 5 – 34 in-lb)						
Axial end play		0 mm (0 in)						

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

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

## < SERVICE DATA AND SPECIFICATIONS (SDS)

[2WD (VR30DDTT)]

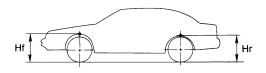
## Wheelarch Height

INFOID:0000000012791568

## **EXCEPT MEXICO**

Except Premium Sport Grade

Item	Standard						
Tire Size	17 inch	19 inch					
Front (Hf)	704 mm (27.72 in) 705 mm (27.76 in)						
Rear (Hr)	699 mm (27.52 in)						



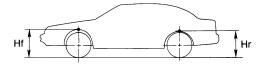
SFA818A

Measure value under unladen\* conditions

\*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

## Premium Sport Grade

Item		Stand	ard
Tire Size	Front	245/40RF19	245/40RF19
	Rear	245/40KF19	265/35RF19
Front (Hf)		706 mm (27.80 in)	708 mm (27.87 in)
Rear (Hr)		699 mm (27.52 in)	696 mm (27.40 in)



SFA818A

Measure value under unladen\* conditions

\*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

## **MEXICO**

Item	Standard
Front (Hf)	717 mm (28.23 in)

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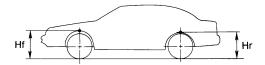
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Revision: November 2016 FSU-47 2016 Q50

## < SERVICE DATA AND SPECIFICATIONS (SDS)

[2WD (VR30DDTT)]

Item	Standard
Rear (Hr)	709 mm (27.91 in)



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Measure value under unladen\* conditions

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

< PRECAUTION > [AWD]

# **PRECAUTION**

## **PRECAUTIONS**

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the "SRS AIR BAG" and "SEAT BELT" of this Service Manual.

#### WARNING:

Always observe the following items for preventing accidental activation.

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that would result in air bag inflation, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see "SRS AIR BAG".
- Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

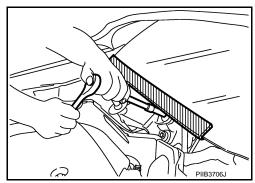
#### **WARNING:**

Always observe the following items for preventing accidental activation.

- When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the
  ignition ON or engine running, never use air or electric power tools or strike near the sensor(s) with
  a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing
  serious injury.
- When using air or electric power tools or hammers, always switch the ignition OFF, disconnect the battery or batteries, and wait at least 3 minutes before performing any service.

Precaution for Procedure without Cowl Top Cover

When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



## Precautions for Removing Battery Terminal

When disconnecting the battery terminal, pay attention to the following.

- Always use a 12V battery as power source.
- Never disconnect battery terminal while engine is running.

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Revision: November 2016 FSU-49 2016 Q50

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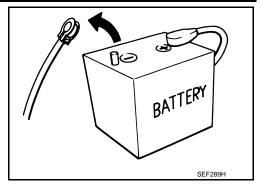
## **PRECAUTIONS**

< PRECAUTION > [AWD]

 When removing the 12V battery terminal, turn OFF the ignition switch and wait at least 30 seconds.

 For vehicles with the engine listed below, remove the battery terminal after a lapse of the specified time:

> BR08DE : 4 minutes V9X engine : 4 minutes : 20 minutes YD25DDTi D4D engine : 2 minutes HR09DET : 12 minutes YS23DDT : 4 minutes HRA2DDT : 12 minutes YS23DDTT : 4 minutes K9K engine : 4 minutes ZD30DDTi : 60 seconds M9R engine : 4 minutes ZD30DDTT : 60 seconds R9M engine : 4 minutes



#### NOTE:

ECU may be active for several tens of seconds after the ignition switch is turned OFF. If the battery terminal is removed before ECU stops, then a DTC detection error or ECU data corruption may occur.

• After high-load driving, if the vehicle is equipped with the V9X engine, turn the ignition switch OFF and wait for at least 15 minutes to remove the battery terminal.

#### NOTE:

- Turbocharger cooling pump may operate in a few minutes after the ignition switch is turned OFF.
- Example of high-load driving
- Driving for 30 minutes or more at 140 km/h (86 MPH) or more.
- Driving for 30 minutes or more on a steep slope.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.

#### NOTE:

If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.

After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.

#### NOTE:

The removal of 12V battery may cause a DTC detection error.

## Precautions for Suspension

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- When installing rubber bushings, the final tightening must be carried out under unladen conditions with tires on ground. Spilled oil might shorten the life of rubber bushings. Be sure to wipe off any spilled oil.
- Unladen conditions mean 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.
- Self-lock nuts are not reusable. Always use new ones when installing. Since new self-lock nuts are pre-oiled, tighten as they are.

## **PREPARATION**

< PREPARATION > [AWD]

# **PREPARATION**

## **PREPARATION**

## **Special Service Tools**

The actual shapes of TechMate tools may differ from those of special service tools illustrated here.

Tool number (TechMate No.) Tool name		Description
ST35652000 ( – ) Shock absorber attachment	ZZA0807D	Disassembling and assembling shock absorber
ST3127S000 (J-25765-A) Preload gauge	ZZA0806D	Measuring rotating torque of ball joint

## **Commercial Service Tools**

Tool name		Description
Power tool		Loosening bolts and nuts
	PBIC0190E	
Spring compressor		Removing and installing coil spring
	S-NT717	

Revision: November 2016 FSU-51 2016 Q50

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## NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

< SYMPTOM DIAGNOSIS >

[AWD]

# SYMPTOM DIAGNOSIS

# NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

## **NVH Troubleshooting Chart**

INFOID:0000000012791575

Jse chart be	low to find the cause of the	symptom. If necessary	, rep	air or	repla	ace th	ese p	oarts.										
Reference		FSU-5Z, FSU-64, FSU-6Z, FSU-69, FSU-71	FSU-62	I	1	<u>FSU-62</u>	FSU-57, FSU-64, FSU-67, FSU-69, FSU-71	ESU-54	FSU-70	NVH in DLN section.	NVH in DLN section.	NVH in FAX and FSU sections.	NVH in WT section.	NVH in WT section.	NVH in FAX section.	NVH in BR section.	NVH in ST section.	
Possible cause and SUSPECTED PARTS  Noise		Improper installation, looseness	Strut deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	PROPELLER SHAFT	DIFFERENTIAL	FRONT AXLE AND FRONT SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING	
		Noise	×	×	×	×	×	×	_	_	×	×	×	×	×	×	×	×
		Shake	×	×	×	×	_	×	_	_	×	_	×	×	×	×	×	×
		Vibration	×	×	×	×	×	_	_	_	×	_	×	×	_	×	_	×
Symptom	FRONT SUSPENSION	Shimmy	×	×	×	×	_	_	×	_	_		×	×	×		×	×
		Judder	×	×	×		_	_	_	_	_		×	×	×		×	×
		Poor quality ride or handling	×	×	×	×	×	_	×	×	_	_	×	×	×	_	_	_

<sup>×:</sup> Applicable, —: Not applicable

## PERIODIC MAINTENANCE

## FRONT SUSPENSION ASSEMBLY

Inspection INFOID:000000012791576

#### COMPONENT PART

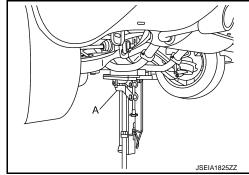
Check the mounting conditions (looseness, backlash) of each component and component conditions (wear, damage) are normal.

Ball Joint Axial End Play

#### **CAUTION:**

When vertically swinging tires with the vehicle lifted, set a jack (A) to garage jack point (rear) or other position to prevent wheel separations.

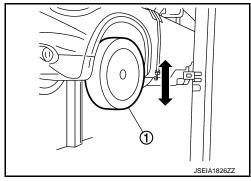
- 1. Set front wheels in a straight-ahead position.
- Check ball joint boot for cracks or other damage. If there are cracks or other damage, replace transverse link.



3. Lift the vehicle and vertically swing tires ① by hand to check if the ball joint has a backlash. If it has a backlash, replace transverse link.

#### NOTE:

- If a rattling noise is generated while travelling, check ball joint axial end play.
- If a roaring noise is generated while travelling, check if the wheel hub assembly bearing has a axial end play. Refer to FAX-17, "Inspection".



Shock absorber

Check for oil leakage, damage. Replace it if necessary.

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# WHEEL ALIGNMENT

## **EXCEPT DIRECT ADAPTIVE STEERING**

## **EXCEPT DIRECT ADAPTIVE STEERING: Inspection**

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#### DESCRIPTION

#### **CAUTION:**

- Camber, caster, kingpin inclination angles cannot be adjusted.
- If camber, caster, or kingpin inclination angle is outside the standard, check front suspension parts for wear and damage. Replace suspect parts if a malfunction is detected.
- Kingpin inclination angle is reference value, no inspection is required.

Measure wheel alignment under unladen conditions.

#### NOTE:

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

#### PRELIMINARY CHECK

Check the following:

- Tires for improper air pressure and wear. Refer to WT-82, "Tire Air Pressure".
- Road wheels for runout.
- Wheel bearing axial end play. Refer to <u>FAX-17</u>, "Inspection".
- Transverse link or upper link ball joint axial end play. Refer to FSU-53, "Inspection".
- shock absorber operation.
- Each mounting part of axle and suspension for looseness and deformation.
- Each of suspension member, shock absorber, upper link and transverse link for cracks, deformation and other damage.
- · Vehicle height (posture).

#### GENERAL INFORMATION AND RECOMMENDATIONS

- A four-wheel thrust alignment should be performed.
- This type of alignment is recommended for any NISSAN/INFINITI vehicle.
- The four-wheel "thrust" process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
- The alignment rack itself should be capable of accepting any NISSAN/INFINITI vehicle.
- The rack should be checked to ensure that it is level.
- Make sure the machine is properly calibrated.
- Your alignment equipment should be regularly calibrated in order to give correct information.
- Check with the manufacturer of your specific equipment for their recommended Service/Calibration Schedule.

#### ALIGNMENT PROCESS

#### **IMPORTANT:**

Use only the alignment specifications listed in this Service Manual.

- When displaying the alignment settings, many alignment machines use "indicators": (Green/red, plus or minus, Go/No Go). Never use these indicators.
- The alignment specifications programmed into your machine that operate these indicators may not be correct.
- This may result in an ERROR.
- Most camera-type alignment machines are equipped with both "Rolling Compensation" method and optional "Jacking Compensation" method to "compensate" the alignment targets or head units. "Rolling Compensation" is the preferred method.
- If using the "Rolling Compensation" method, after installing the alignment targets or head units, push or pull on the rear wheel to move the vehicle. **Do not push or pull on the vehicle body.**
- If using the "Jacking Compensation" method, after installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.

#### NOTE:

Do not use the "Rolling Compensation" method if you are using sensor-type alignment equipment.

Follow all instructions for the alignment machine you're using for more information.

WHEEL ALIGNMENT [AWD] < PERIODIC MAINTENANCE > **EXCEPT DIRECT ADAPTIVE STEERING: Adjustment** INFOID:0000000012791578 Α TOE-IN Loosen the steering outer socket, and then adjust the length using steering inner socket. В : Refer to FSU-73, "Wheel Alignment". Toe-in **CAUTION:**  Always evenly adjust both toe-in alternately and adjust the difference between the left and right to · Always fix the steering inner socket when tightening the steering outer socket. After toe-in adjustment, adjust neutral position of steering angle sensor. Refer to BRC-91, "Description". D DIRECT ADAPTIVE STEERING DIRECT ADAPTIVE STEERING: Inspection INFOID:0000000012791579 DESCRIPTION **CAUTION:**  Always perform DAST calibration with CONSULT when adjusting the toe-in. (It cannot be adjusted without CONSULT.) Camber, caster, kingpin inclination angles cannot be adjusted. If camber, caster, or kingpin inclination angle is outside the standard, check front suspension parts for wear and damage. Replace suspect parts if a malfunction is detected. Kingpin inclination angle is reference value, no inspection is required. Measure wheel alignment under unladen conditions. Н "Unladen conditions" means that fuel, engine coolant, and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions. PRELIMINARY CHECK Check the following: Tires for improper air pressure and wear. Refer to WT-82, "Tire Air Pressure". · Road wheels for runout. Wheel bearing axial end play. Refer to <u>FAX-17</u>, "Inspection". Transverse link or upper link ball joint axial end play. Refer to <u>FSU-53</u>, "Inspection". Shock absorber operation. K Each mounting part of axle and suspension for looseness and deformation. Each of suspension member, shock absorber, upper link and transverse link for cracks, deformation and other damage. L Vehicle height (posture). GENERAL INFORMATION AND RECOMMENDATIONS A four-wheel thrust alignment should be performed. M

- This type of alignment is recommended for any NISSAN/INFINITI vehicle.
- The four-wheel "thrust" process helps ensure that the vehicle is properly aligned and the steering wheel is centered.
- The alignment rack itself should be capable of accepting any NISSAN/INFINITI vehicle.
- The rack should be checked to ensure that it is level.
- Make sure the machine is properly calibrated.
- Your alignment equipment should be regularly calibrated in order to give correct information.
- Check with the manufacturer of your specific equipment for their recommended Service/Calibration Schedule.

#### ALIGNMENT PROCESS

### IMPORTANT:

Use only the alignment specifications listed in this Service Manual.

- When displaying the alignment settings, many alignment machines use "indicators": (Green/red, plus or minus, Go/No Go). Never use these indicators.
- The alignment specifications programmed into your machine that operate these indicators may not be correct.
- This may result in an ERROR.

**FSU-55** Revision: November 2016 2016 Q50

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## WHEEL ALIGNMENT

#### < PERIODIC MAINTENANCE >

[AWD]

- Most camera-type alignment machines are equipped with both "Rolling Compensation" method and optional "Jacking Compensation" method to "compensate" the alignment targets or head units. "Rolling Compensation" is the preferred method.
- If using the "Rolling Compensation" method, after installing the alignment targets or head units, push or pull on the rear wheel to move the vehicle. **Do not push or pull on the vehicle body.**
- If using the "Jacking Compensation" method, after installing the alignment targets or head units, raise the vehicle and rotate the wheels 1/2 turn both ways.
   NOTE:

Do not use the "Rolling Compensation" method if you are using sensor-type alignment equipment.

- Follow all instructions for the alignment machine you're using for more information.

## **DIRECT ADAPTIVE STEERING: Adjustment**

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### **CAUTION:**

Always perform DAST calibration with CONSULT when adjusting the toe-in. (It cannot be adjusted without CONSULT.)

#### TOE-IN

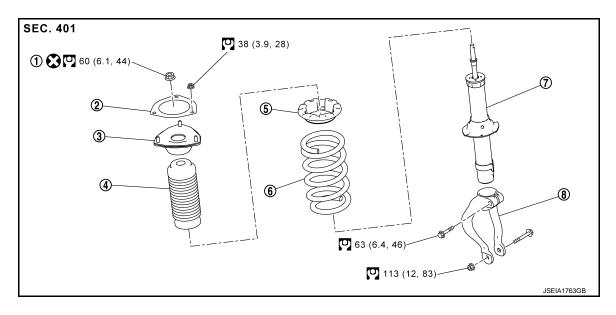
• Proceed to <u>ST-126. "ALIGNMENT TESTER: Inspection and Adjustment"</u> (Alignment tester), <u>ST-128.</u> "EXCEPT ALIGNMENT TESTER: Inspection and Adjustment" (Except alignment tester).

# REMOVAL AND INSTALLATION

## FRONT COIL SPRING AND SHOCK ABSORBER

**Exploded View** INFOID:0000000012791581 В

### WITHOUT DIGITAL MOTION CONTROL



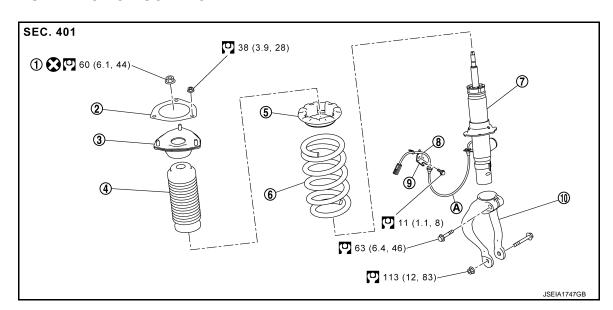
Piston rod lock nut Bound bumper

Shock absorber

- Mounting seal
- Rubber seat
- Shock absorber arm
- Shock absorber mounting bracket
- Coil spring

- : N·m (kg-m, ft-lb)
- : Always replace after every disassembly.

## WITH DIGITAL MOTION CONTROL



1 Piston rod lock nut

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Mounting seal

ing bracket

Dynamic digital suspension mount-

Bound bumper (5) Rubber seat 6 Coil spring

(3)

**FSU-57** Revision: November 2016 2016 Q50

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## FRONT COIL SPRING AND SHOCK ABSORBER

## < REMOVAL AND INSTALLATION >

[AWD]

7 Dynamic digital suspension

(8) Dynamic digital suspension harness (9) Dynamic digital suspension bracket

Shock absorber arm

Identification line

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

## Removal and Installation

INFOID:0000000012791582

#### REMOVAL

- Remove tires with power tool. Refer to <u>WT-74, "Exploded View"</u>.
- Remove wheel sensor harness from steering knuckle. Refer to BRC-191, "FRONT WHEEL SENSOR: Removal and Installation".

#### **CAUTION:**

#### Never pull on wheel sensor harness.

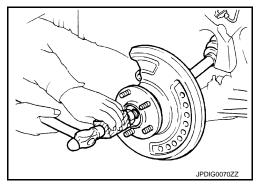
- 3. Remove brake hose mounting nut, and separate brake hose from steering knuckle. Refer to BR-28, "FRONT: Removal and Installation".
- 4. Remove front fender protector front. (With digital motion control) Refer to EXT-30, "FENDER PROTEC-TOR: Removal and Installation".
- 5. Disconnect dynamic digital suspension harness connector, and remove dynamic digital suspension harness. (With digital motion control)
- Remove stabilizer connecting rod from transverse link. Refer to FSU-69, "Removal and Installation".
- 7. Remove dynamic digital suspension harness broket. (With digital motion control)
- Separate upper link from steering knuckle. Refer to FSU-67, "Removal and Installation".
- 9. Remove cotter pin, and then loosen wheel hub lock nut with power tool. Refer to FAX-19, "Exploded View".
- 10. Patch wheel hub lock nut with a piece of wood. Hammer the wood to disengage wheel hub and bearing assembly from drive shaft.

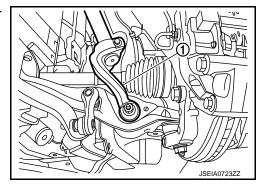
## **CAUTION:**

- Never place drive shaft joint at an extreme angle. Also be careful not to overextend slide joint.
- Never allow drive shaft to hang down without support for or joint sub-assembly, shaft and the other parts.

Use suitable puller, if wheel hub and bearing assembly and drive shaft cannot be separated even after performing the above procedure.

11. Remove shock absorber assembly or dynamic digital suspension assembly (1) from transverse link with power tool.





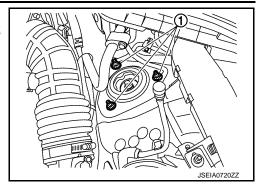
Separate shock absorber or dynamic digital suspension and shock absorber arm.

## FRONT COIL SPRING AND SHOCK ABSORBER

#### < REMOVAL AND INSTALLATION >

[AWD]

13. Remove shock absorber mounting bracket or dynamic digital suspension mounting bracket nuts (1), and then remove shock absorber assembly or dynamic digital suspension assembly.



## **INSTALLATION**

Note the following, and install in the reverse order of removal.

#### **CAUTION:**

Never tap on the ball joint cap of the stabilizer connecting rod with a hammer or a similar item when inserting the stabilizer connecting rod into the transverse link.

 Install dynamic digital suspension harness in a manner such that outward identification line out of 2 faces operator as dynamic digital suspension is fixed. (With digital motion control) **CAUTION:** 

Never twist dynamic digital suspension harness.

- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to FSU-62, "Inspection".
- After replacing the shock absorber or dynamic digital suspension, always follow the disposal procedure to discard the shock absorber. Refer to FSU-62, "Disposal".

## Disassembly and Assembly

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#### DISASSEMBLY

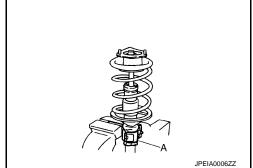
#### **CAUTION:**

Never damage shock absorber piston rod when removing components from shock absorber.

- Remove the shock absorber arm from shock absorber.
- Install shock absorber attachment (A) [SST: ST35652000 ( -)] to shock absorber and secure it in a vise.

#### **CAUTION:**

When installing the shock absorber attachment to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.



3. Using a spring compressor (A) (commercial service tool), compress coil spring between rubber seat and shock absorber until coil spring with a spring compressor is free.

#### **CAUTION:**

Be sure a spring compressor is securely attached coil spring. Compress coil spring

- 4. Make sure coil spring with a spring compressor between rubber seat and shock absorber is free. And then remove piston rod lock nut while securing the piston rod tip so that piston rod does not turn.
- 5. Remove mounting seal, shock absorber mounting bracket, rubber seat, bound bumper from shock absorber.
- 6. After remove coil spring with a spring compressor (commercial service tool), and then gradually release a spring compressor.

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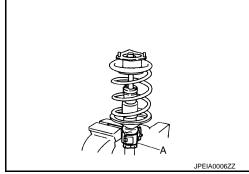
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[AWD] < REMOVAL AND INSTALLATION >

#### **CAUTION:**

Loosen while making sure coil spring attachment position does not move.

- 7. Remove the shock absorber attachment (A) [SST: ST35652000 ( - )] from shock absorber.
- 8. Perform inspection after disassembly. Refer to FSU-62, "Inspection".



#### ASSEMBLY

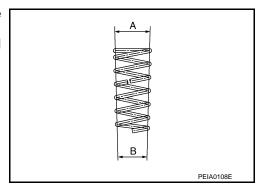
Install shock absorber attachment [SST: ST35652000 ( - )] to shock absorber and secure it in a vise. **CAUTION:** 

When installing the shock absorber attachment to shock absorber, wrap a shop cloth around shock absorber to protect it from damage.

2. Compress coil spring using a spring compressor (commercial service tool), and install it onto shock absorber.

#### **CAUTION:**

- Install with the large-diameter side (A) facing up and the small-diameter side (B) facing down.
- Be sure a spring compressor is securely attached to coil spring. Compress coil spring.



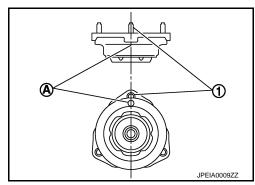
3. Install the shock absorber mounting bracket and rubber seat. **CAUTION:** 

Align the paint mark (A) to the stud bolt (1) position when assembling.

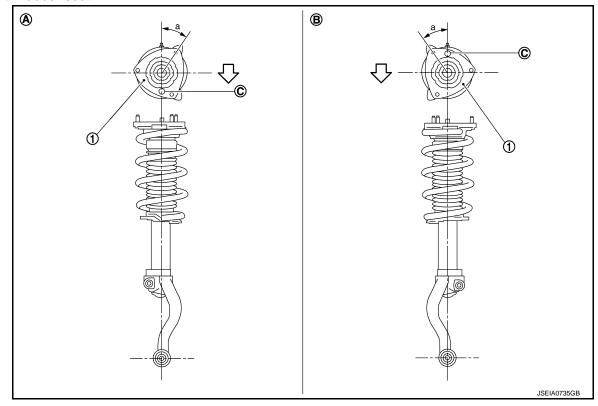
4. Apply soapy water to bound bumper.

#### **CAUTION:**

Never use machine oil.



Insert bound bumper into shock absorber mounting bracket, and then install it to shock absorber together with rubber seat.



1 Shock absorber mounting bracket

(A) Right side

(B) Left side

© Coil spring lower end position

∀
 ∃: Vehicle front

Install the shock absorber mounting bracket as shown in the figure.

#### Angle (a) : 34.2°

- Check that the lower end of the coil spring © is positioned at the spring lower seat of the shock absorber.
- 6. Secure piston rod tip so that piston rod does not turn, then tighten piston rod lock nut with specified torque.

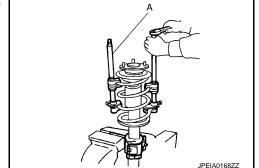
### **CAUTION:**

#### Never reuse piston rod lock nut.

7. Gradually release a spring compressor (commercial service tool), and remove coil spring.

#### **CAUTION:**

Loosen while making sure coil spring attachment position does not move.



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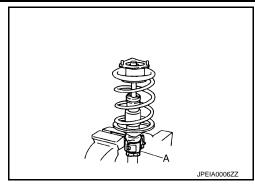
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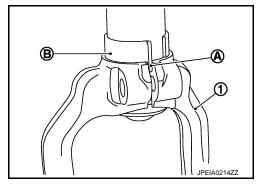
8. Remove the shock absorber attachment (A) [SST: ST35652000 ( - )] from shock absorber.



Install the shock absorber arm to shock absorber. CAUTION:

Align the shock absorber protrusion (A) with the groove of the shock absorber arm (1). The upper surface of the shock absorber arm must be in full contact with the lower surface of locating bracket (B).

10. Install the mounting seal to shock absorber mounting bracket.



Inspection INFOID:000000012791584

### INSPECTION AFTER DISASSEMBLY

Shock Absorber or Dynamic Digital Suspension

Check the following items, and replace the part if necessary.

- Shock absorber for deformation, cracks or damage.
- Piston rod for damage, uneven wear or distortion.
- Oil leakage.

Shock absorber Mounting Bracket or Dynamic Digital Suspension Bracket and Rubber Parts Inspection Check shock absorber mounting bracket for cracks and rubber parts for wear. Replace it if necessary

#### Coil Spring

Check coil spring for cracks, wear or damage. Replace it if necessary.

#### INSPECTION AFTER INSTALLATION

- Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR: Exploded View"</u>.
- Check wheel alignment.
  - Except direct adaptive steering models: Refer to <u>FSU-54</u>, <u>"EXCEPT DIRECT ADAPTIVE STEERING</u>: <u>Inspection"</u>.
  - Direct adaptive steering models: Refer to <u>FSU-55</u>, "<u>DIRECT ADAPTIVE STEERING</u>: <u>Inspection</u>".
- 3. Adjust neutral position of steering angle sensor. Refer to <u>BRC-91, "Description"</u> (Except direct adaptive steering models).

Disposal INFOID:000000012791585

1. Set shock absorber horizontally with the piston rod fully extended.

## FRONT COIL SPRING AND SHOCK ABSORBER

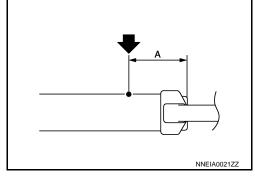
## < REMOVAL AND INSTALLATION >

[AWD]

- Drill 2 3 mm (0.08 0.12 in) hole at the position ( ) from top as shown in the figure to release gas gradually.
   CAUTION:
  - Wear eye protection (safety glasses).
  - Wear gloves.
  - Be careful with metal chips or oil blown out by the compressed gas.

#### NOTE:

- Drill vertically in this direction (\(\bigsim\)).
- Directly to the outer tube avoiding brackets.
- The gas is clear, colorless, odorless, and harmless.



A : 20 – 30 mm (0.79 – 1.18 in)

- 3. Position the drilled hole downward and drain oil by moving the piston rod several times. **CAUTION:** 
  - Dispose of drained oil according to the law and local regulations.

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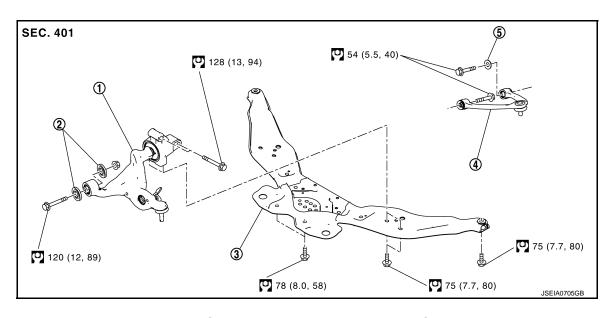
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## TRANSVERSE LINK

Exploded View



(1) Transverse link

Stopper bushing

(3) Front cross bar

4 Upper link

Stopper arm bushing

: N·m (kg-m, ft-lb)

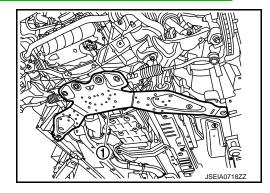
: Always replace after every disassembly.

## Removal and Installation

INFOID:0000000012791587

#### **REMOVAL**

- Remove tires with power tool. Refer to <u>WT-74, "Removal and Installation"</u>.
- 2. Remove engine under cover. Refer to EXT-35, "FRONT UNDER COVER: Removal and Installation".
- 3. Remove front crossbar (1).



- Separate shock absorber arm from transverse link side. Refer to <u>FSU-57</u>, "Exploded View".
- 5. Separate steering outer socket from steering knuckle.
  - Hydraulic pump electric P/S models: Refer to ST-45, "Removal and Installation"
  - EPS models: Refer to <u>ST-95, "Removal and Installation"</u>
  - Direct adaptive steering models: Refer to ST-146, "Removal and Installation"
- 6. Remove transverse link from steering knuckle. Refer to FAX-19, "Exploded View".
- 7. Set jack under steering knuckle.

### **CAUTION:**

- Check the stable condition when using a jack.
- · Never damage steering knuckle with a jack.

- 8. Remove mounting bolts, nuts, and stopper bushings, and then remove transverse link from suspension and vehicle.
- Perform inspection after removal. Refer to <u>FSU-65, "Inspection"</u>.

#### INSTALLATION

Note the following, and install in the reverse order of removal.

- Never reuse transverse link mounting nut.
- Never tap on the ball joint cap of the stabilizer connecting rod with a hammer or a similar item when inserting
  the stabilizer connecting rod into the transverse link.
- Perform final tightening of bolts and nuts at the front suspension member installation and shock absorber lower side (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to <u>FSU-65</u>, "Inspection".

Inspection INFOID:000000012791588

### INSPECTION AFTER REMOVAL

#### **Appearance**

Check the following items, and replace the part if necessary.

- Transverse link for deformation, cracks or damage.
- Check the bushing for complete separation. (If completely separated, inner metal can be pulled out from transverse link.)
- Ball joint boot for cracks or other damage, and also for grease leakage.

#### **Ball Joint Inspection**

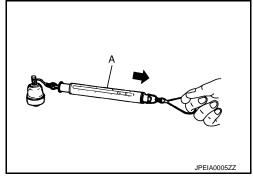
Manually move ball stud to confirm it moves smoothly with no binding.

### Swing Torque Inspection

- 1. Move the ball stud at least ten times by hand to check for smooth movement.
- Hook a spring balance (A) at cotter pin mounting hole. Confirm spring balance measurement value is within specifications when ball stud begins moving.

### Swing toque :Refer to FSU-74, "Ball Joint".

 If swing torque exceeds standard range, replace transverse link assembly.

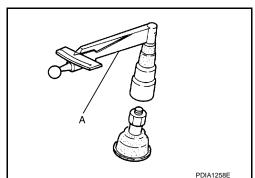


#### Rotating Torque Inspection

- Move the ball stud at least ten times by hand to check for smooth movement.
- Attach mounting nut to ball stud. Make sure that rotating torque is within specifications with a preload gauge (A) [SST: 3127S000 (J-25765-A)].

#### Rotating toque : Refer to FSU-74, "Ball Joint".

 If rotating torque exceeds standard range, replace transverse link assembly.



#### Axial End Play Inspection

- Move the ball stud at least ten times by hand to check for smooth movement.
- 2. Move tip of ball stud in axial direction to check for looseness.
- If there is axial end play, replace transverse link assembly.

#### INSPECTION AFTER INSTALLATION

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## TRANSVERSE LINK

### < REMOVAL AND INSTALLATION >

[AWD]

- Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR: Exploded View"</u>.
- 2. Check wheel alignment.
  - Except direct adaptive steering models: Refer to <u>FSU-54</u>, <u>"EXCEPT DIRECT ADAPTIVE STEERING: Inspection"</u>.
  - Direct adaptive steering models: Refer to FSU-55, "DIRECT ADAPTIVE STEERING: Inspection".
- 3. Adjust neutral position of steering angle sensor. Refer to <u>BRC-91, "Work Procedure"</u> (Except direct adaptive steering models).

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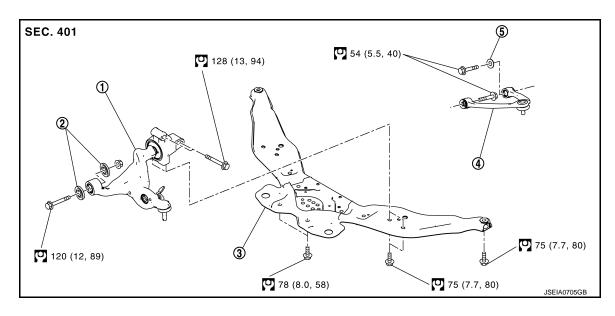
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## **UPPER LINK**

Exploded View



Transverse link

Stopper bushing

(3) Front cross bar

4 Upper link

Stopper arm bushing

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

## Removal and Installation

INFOID:0000000012791590

#### REMOVAL

- 1. Remove tires from with power tool. Refer to WT-74, "Exploded View".
- Remove upper link from steering knuckle. Refer to <u>FAX-19</u>, "Exploded View".
- Remove shock absorber assembly. Refer to <u>FSU-58</u>, "Removal and Installation".
- Remove mounting bolts and stopper arm bushing, and then remove upper link from vehicle.
- 5. Perform inspection after removal. Refer to FSU-67, "Inspection".

#### **INSTALLATION**

Note the following, and install in the reverse order of removal.

- Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.
- Perform inspection after installation. Refer to <u>FSU-67</u>, "Inspection".

Inspection INFOID:0000000012791591

#### INSPECTION AFTER REMOVAL

#### **Appearance**

Check the following items, and replace the part if necessary.

- Upper link and bushing for deformation, cracks or damage.
- Ball joint boot for cracks or other damage, and also for grease leakage.

#### **Ball Joint Inspection**

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

#### Swing Torque Inspection

1. Move the ball stud at least ten times by hand to check for smooth movement.

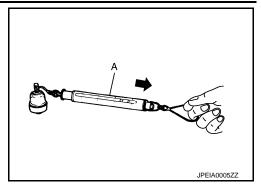
Revision: November 2016 FSU-67 2016 Q50

#### < REMOVAL AND INSTALLATION >

 Hook a spring balance (A) at cutout on ball stud. Confirm spring balance measurement value is within specifications when ball stud begins moving.

## Swing torque : Refer to FSU-74, "Ball Joint".

If swing torque exceeds standard range, replace upper link assembly.



#### Axial End Play Inspection

- 1. Move the ball stud at least ten times by hand to check for smooth movement.
- Move tip of ball stud in axial direction to check for looseness.
- If there is axial end play, replace upper link assembly.

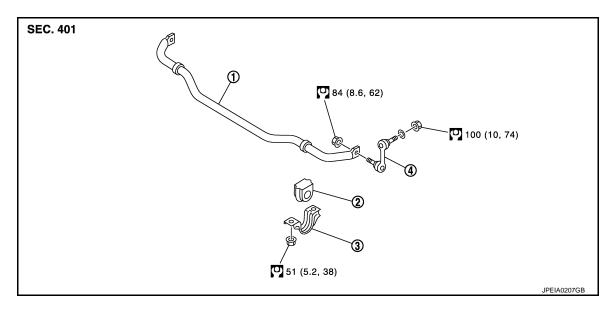
#### INSPECTION AFTER INSTALLATION

- Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR: Exploded View"</u>.
- 2. Check wheel alignment.
  - Except direct adaptive steering models: Refer to <u>FSU-54</u>, <u>"EXCEPT DIRECT ADAPTIVE STEERING</u>: <u>Inspection"</u>.
  - Direct adaptive steering models: Refer to FSU-55, "DIRECT ADAPTIVE STEERING: Inspection".
- Adjust neutral position of steering angle sensor. Refer to <u>BRC-91, "Description"</u> (Except direct adaptive steering models).

## FRONT STABILIZER

**Exploded View** 

INFOID:0000000012791592



Stabilizer bar

② Stabilizer bushing

(3) Stabilizer clamp

4 Stabilizer connecting rod

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

## Removal and Installation

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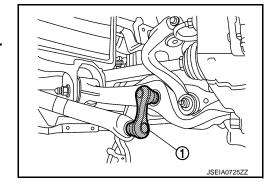
#### REMOVAL

Remove tires with power tool. Refer to <u>WT-74, "Removal and Installation"</u>.

Remove engine under cover with power tool. Refer to <u>EXT-36</u>, "FLOOR UNDER COVER: Removal and <u>Installation"</u>.

Remove stabilizer connecting rods ①. CAUTION:

Apply a matching mark to identify the installation position.



- 4. Remove stabilizer clamp and stabilizer bushing.
- Remove stabilizer bar.
- Perform inspection after removal. Refer to <u>FSU-70, "Inspection"</u>.

#### INSTALLATION

Note the following, and install in the reverse order of removal.

Check the matching mark when installing.

Revision: November 2016 FSU-69 2016 Q50

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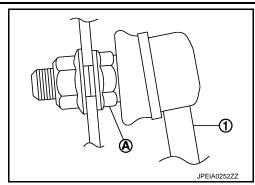
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## FRONT STABILIZER

## < REMOVAL AND INSTALLATION >

[AWD]

• To install stabilizer connecting rod ①, tighten the mounting nut with hexagon part (A) on the stabilizer connecting rod side fixed.



• Perform final tightening of fixing parts at the vehicle installation position (rubber bushing), under unladen conditions with tires on level ground.

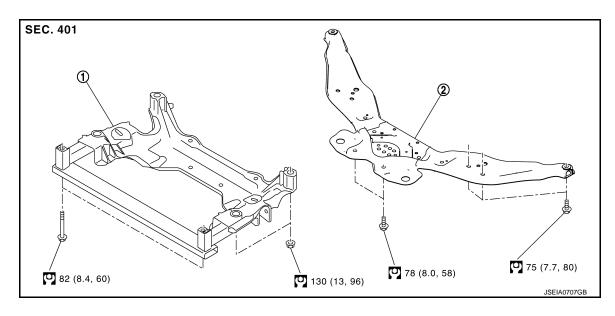
Inspection INFOID:000000012791594

## INSPECTION AFTER REMOVAL

Check stabilizer bar, stabilizer connecting rod, stabilizer bushing and stabilizer clamp for deformation, cracks or damage. Replace it if necessary.

## FRONT SUSPENSION MEMBER

**Exploded View** INFOID:0000000012791595



(1) Front suspension member

Front cross bar

: N·m (kg-m, ft-lb)

: Always replace after every disassembly.

## Removal and Installation

REMOVAL

- Remove tires with power tool. Refer to WT-74, "Removal and Installation".
- 2. At first, remove the engine and the transmission assembly with front suspension member downward. Then separate the engine, transmission.
  - 2.0L TURBO GASOLINE ENGINE: Refer to EM-102, "Removal and Installation".
  - VR30DDTT: Refer to EM-209, "AWD: Removal and Installation".
- Remove front cross bar.
- Remove the following parts.
  - Steering knuckle and wheel hub and bearing assembly: Refer to FAX-19, "Exploded View".
  - · Steering gear assembly.
  - Hydraulic pump electric P/S models: Refer to ST-44, "Exploded View"
  - EPS models: Refer to ST-93, "Exploded View"
  - Direct adaptive steering models: Refer to <u>ST-143</u>, "Exploded View"
  - Stabilizer bar and stabilizer connecting rod: Refer to FSU-69, "Exploded View".
  - Transverse link: Refer to <u>FSU-64</u>, "<u>Exploded View</u>".

#### **INSTALLATION**

Note the following, and install in the reverse order of removal.

- Perform final tightening of bolts and nut at the vehicle installation position (rubber bushing), under unladen condition with tires on level ground.
- Perform inspection after installation. Refer to FSU-71, "Inspection".

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### INSPECTION AFTER REMOVAL

Check the front suspension member for significant deformation, cracks, or damages. Replace if necessary.

#### INSPECTION AFTER INSTALLATION

**FSU-71** Revision: November 2016 2016 Q50

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## FRONT SUSPENSION MEMBER

## < REMOVAL AND INSTALLATION >

[AWD]

- Check wheel sensor harness for proper connection. Refer to <u>BRC-191, "FRONT WHEEL SENSOR: Exploded View"</u>.
- 2. Check wheel alignment.
  - Except direct adaptive steering models: Refer to <u>FSU-54</u>, <u>"EXCEPT DIRECT ADAPTIVE STEERING: Inspection"</u>.
  - Direct adaptive steering models: Refer to FSU-55, "DIRECT ADAPTIVE STEERING: Inspection".
- 3. Adjust neutral position of steering angle sensor. Refer to <u>BRC-91, "Description"</u> (Except direct adaptive steering models).

< SERVICE DATA AND SPECIFICATIONS (SDS)

[AWD]

INFOID:0000000012791598

# SERVICE DATA AND SPECIFICATIONS (SDS)

# SERVICE DATA AND SPECIFICATIONS (SDS)

Wheel Alignment

#### WARNING:

If the vehicle is equipped with the ICC system and the rear toe has been adjusted during a wheel alignment, the ICC sensor must be aligned. Refer to <a href="CCS-114">CCS-114</a>, "TYPE 1: Description" (TYPE 1) or <a href="CCS-118">CCS-118</a>, "TYPE 2: Description" (TYPE 2).

#### 2.0L TURBO GASOLINE ENGINE

Item		Standard	
Camber Degree minute (Decimal degree)		Minimum	-1° 20′ (-1.33°)
		Nominal	-0° 35′ (-0.58°)
		Maximum	0° 10′ (0.16°)
		Left and right difference	0° 30′ (0.50°) or less
Caster Degree minute (Decimal degree)		Minimum	3° 00′ (3.00°)
		Nominal	4° 20′ (4.33°)
		Maximum	5° 40′ (5.66°)
		Left and right difference	0° 30′ (0.50°) or less
		Minimum	6° 45′ (6.75°)
	nclination minute (Decimal degree)	Nominal	7° 30′ (7.50°)
Degree minute (Decimal degree)		Maximum	8° 15′ (8.25°)
Total toe-in Distance  Toe-in  Total toe-angle Degree minute (Decimal d		Minimum	0 mm (0.00 in)
		Nominal	In 2 mm (In 0.08 in)
		Maximum	In 4 mm (In 0.16 in)
	Total toe-angle Degree minute (Decimal degree)	Minimum	0° 00′ (0.00°)
		Nominal	In 0° 10′ (In 0.17°)
		Maximum	In 0° 20′ (In 0.33°)

Measure value under unladen\* conditions.

#### VR30DDTT

Item		Standard
	Minimum	-1° 20′ (-1.33°)
Camber	Nominal	-0° 35′ (-0.58°)
Degree minute (Decimal degree)	Maximum	0° 10′ (0.16°)
	Left and right difference	0° 30′ (0.50°) or less
Caster Degree minute (Decimal degree)	Minimum	2° 55′ (2.92°)
	Nominal	4° 15′ (4.25°)
	Maximum	5° 35′ (5.58°)
	Left and right difference	0° 30′ (0.50°) or less
Kingpin inclination Degree minute (Decimal degree)	Minimum	6° 45′ (6.75°)
	Nominal	7° 30′ (7.50°)
	Maximum	8° 15′ (8.25°)

Revision: November 2016 FSU-73 2016 Q50

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

## < SERVICE DATA AND SPECIFICATIONS (SDS)

[AWD]

Item		Standard	
Toe-in	Total toe-in Distance	Minimum	0 mm (0.00 in)
		Nominal	In 2 mm (In 0.08 in)
		Maximum	In 4 mm (In 0.16 in)
	Total toe-angle Degree minute (Decimal degree)	Minimum	0° 00′ (0.00°)
		Nominal	In 0° 10′ (In 0.17°)
		Maximum	In 0° 20′ (In 0.33°)

Measure value under unladen\* conditions.

Ball Joint INFOID:000000012791599

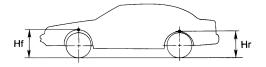
Item		Standard
Suring torque	Transverse link	0.5 – 3.6 N·m (0.06 – 0.36 kg-m, 5 – 31 in-lb)
Swing torque	Upper link	0 − 2.0 N·m (0 − 0.20 kg-m, 0 − 17 in-lb)
Measurement on spring balance	Transverse link	7.8 – 56.3 N (0.8 – 5.7 kg, 1.8 – 12.6 lb)
weasurement on spring balance	Upper link	0 – 61.5 N (0 – 6.2 kg, 0 – 13.8 lb)
Rotating torque Transverse link		0.5 − 3.9 N·m (0.06 − 0.39 kg-m, 5 − 34 in-lb)
Axial end play		0 mm (0 in)

## Wheelarch Height

INFOID:0000000012791600

#### 2.0L TURBO GASOLINE ENGINE

Item	Standard	
Front (Hf)	715 mm (28.15 in)	
Rear (Hr)	708 mm (27.87 in)	



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Measure value under unladen\* conditions.

## VR30DDTT

## **Except Premium Sport Grade**

Item	Standard	
Tire Size	17 inch	19 inch
Front (Hf)	713 mm (28.07 in)	714 mm (28.11 in)

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

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

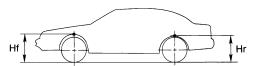
## < SERVICE DATA AND SPECIFICATIONS (SDS)

[AWD]

Item	Standard	
Tire Size	17 inch	19 inch
Rear (Hr)	708 mm (27.87 in)	709 mm (27.91 in)

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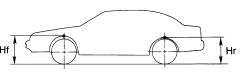
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Measure value under unladen\* conditions.

\*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

## Premium Sport Grade

Item	Standard
Front (Hf)	715 mm (28.15 in)
Rear (Hr)	709 mm (27.91 in)



SFA818A

Measure value under unladen\* conditions.

\*: Fuel, engine coolant and lubricant are full. Spare tire, jack, hand tools and mats are in designated positions.

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