SECTION FSU
FRONT SUSPENSION

CONTENTS

SYMPTOM DIAGNOSIS

NOISE, VIBRATION AND HARSHNESS (NVH) TROUBLESHOOTING

NVH Troubleshooting Chart

INFOID:0000000009163808

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

Possible cause and SUSPECTED PARTS			Improper installation looseness	Shock absorber deformation, damage or deflection	Bushing or mounting deterioration	Parts interference	Spring fatigue	Suspension looseness	Incorrect wheel alignment	Stabilizer bar fatigue	PROPELLER SHAFT	DIFFERENTIAL	FRONT AXLE AND FRONT SUSPENSION	TIRE	ROAD WHEEL	DRIVE SHAFT	BRAKE	STEERING
Reference			This work is recommended to be performed by GT-R certified NISSAN dealer.	This work is recommended to be performed by GT-R certified NISSAN dealer.	—	—	—	This work is recommended to be performed by GT-R certified NISSAN dealer.	This work is recommended to be performed by GT-R certified NISSAN dealer.	This work is recommended to be performed by GT-R certified NISSAN dealer.	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.
Symptom	FRONT SUSPENSION	Noise	×	×	×	×	×	×			×	×	×	×	×	×	×	×
		Shake	×	×	×	×		×			×		×	×	×	×	×	×
		Vibration	×	×	×	×	×				×		×	×		×		×
		Shimmy	×	×	×	×			×				×	×	×		×	×
		Judder	×	×	×								×	×	×		×	×
		Poor quality ride or handling	×	×	×	×	×		×	×			×	×	×			

×: Applicable

PRECAUTION

PRECAUTIONS

Precaution for Working Range at a Regular Dealership

INFOID:0000000009180199

CAUTION:
The service items unmentioned on this manual are recommended to be performed by a GT-R certified NISSAN dealer. Because those service items require special equipment and a GT-R certified technical staff who completed special training.

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

INFOID:0000000009163809

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, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, 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, and wait at least 3 minutes before performing any service.**

Precautions Necessary for Steering Wheel Rotation After Battery Disconnection

INFOID:0000000009163810

CAUTION:
Comply with the following cautions to prevent any error and malfunction.
- **Before removing and installing any control units, first turn the ignition switch to the LOCK position, then disconnect both battery cables.**
- **After finishing work, confirm that all control unit connectors are connected properly, then re-connect both battery cables.**
- **Always use CONSULT to perform self-diagnosis as a part of each function inspection after finishing work. If a DTC is detected, perform trouble diagnosis according to self-diagnosis results.**

For vehicle with steering lock unit, if the battery is disconnected or discharged, the steering wheel will lock and cannot be turned.
If turning the steering wheel is required with the battery disconnected or discharged, follow the operation procedure below before starting the repair operation.

OPERATION PROCEDURE

1. Connect both battery cables.

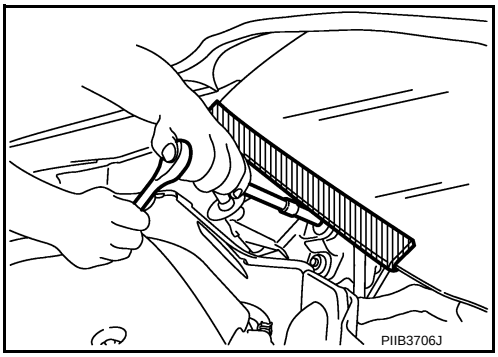
NOTE:
Supply power using jumper cables if battery is discharged.

2. Turn the ignition switch to ACC position.
(At this time, the steering lock will be released.)
3. Disconnect both battery cables. The steering lock will remain released with both battery cables disconnected and the steering wheel can be turned.
4. Perform the necessary repair operation.
5. When the repair work is completed, re-connect both battery cables. With the brake pedal released, turn the ignition switch from ACC position to ON position, then to LOCK position. (The steering wheel will lock when the ignition switch is turned to LOCK position.)
6. Perform self-diagnosis check of all control units using CONSULT.

Precaution for Procedure without Cowl Top Cover

INFOID:0000000009163811

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



Precaution for Battery Service

INFOID:0000000009163812

Before disconnecting the battery, lower both the driver and passenger windows. This will prevent any interference between the window edge and the vehicle when the door is opened/closed. During normal operation, the window slightly raises and lowers automatically to prevent any window to vehicle interference. The automatic window function will not work with the battery disconnected.

Aluminum Die-Casting Parts Handling

INFOID:0000000009163813

PROHIBITION OF WELDING OR BEATING REPAIR

- Material made of aluminum die-casting parts is heat-treated and looses strength when being exposed to welding heat. Do not perform welding repair for cracks, damage or others.
- For aluminum die-casting parts deformation, do not perform repair by beating. Always repair by replacement as an assembly.

CRACK CHECK

When the vehicle is damaged, always perform a visual deformation check and a crack check.

Crack Check Procedures

For a crack check, use dye penetrant inspection fluid (pre-cleaning fluid, penetrant fluid and developer fluid).

CAUTION:

Always perform a crack check in accordance with the procedures specified by the manufacturer of the dye penetrant inspection fluid.

1. Spray pre-cleaning fluid on the checking surface for cleaning.
2. Spray penetrant fluid on the checking surface and wait until the penetrant fluid soaks into any cracks.
3. Wipe off excessive penetrant fluid, and then also lightly wipe off penetrant fluid using a wet cloth.
4. Spray developer fluid on the checking surface.
5. Cracks, if any, are dyed red in color.

STRAY CURRENT CORROSION

- Corrosion occurs to aluminum die-casting parts by the stray current corrosion phenomenon, when directly contacting other parts made of steel. Always apply anti-stray current corrosion paint (primer) on the mounting surface.

- Clean mounting surface to prevent any foreign matter, steel powder or others from being mixed in. Always apply the specified adhesive when installing.
- Corrosion by stray current corrosion may occur when installing with any other bolts than the specified bolt. Always use the specified bolt that is surface treated.
- When loosening the specified bolt that is tightened, the treated surface may peel. Never reuse the specified bolt that is tightened once.

TIGHTENING TORQUE CONTROL

Material made of aluminum die-casting parts is soft in term of hardness. Tightening torque must be controlled exactly as specified. Always use a torque wrench to install any part to the specified tightening torque.

WARNING:

Never use a power tool to remove or tighten bolts for aluminum die-casting part to prevent damage to aluminum die-casting parts.

General Precautions

INFOID:0000000009163814

CAUTION:

After finishing servicing, check that all the tools and waste are stored in a customary place.

PERIODIC MAINTENANCE

FRONT SUSPENSION ASSEMBLY

Inspection

INFOID:0000000009163818

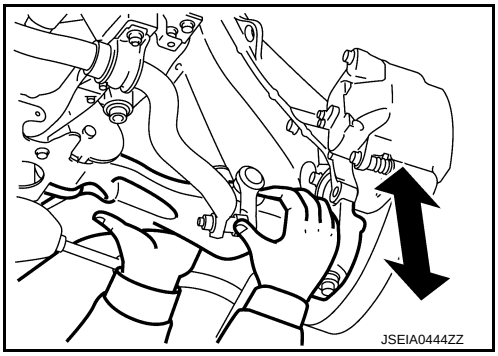
MOUNTING INSPECTION

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

Ball Joint Axial End Play

1. Set front wheels in a straight-ahead position.
2. Move axle side of transverse link and upper link in the axial direction by hand. Check there is no end play.

Axial end play : 0 mm (0 in)



CAUTION:

- **Never depress brake pedal when measuring.**
- **Never perform with tires on level ground.**
- **Be careful not to damage ball joint boot. Never damage the installation position by applying excessive force.**

SHOCK ABSORBER

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

WHEEL ALIGNMENT

Inspection

INFOID:0000000009163819

DESCRIPTION

CAUTION:

- **Kingpin inclination angles cannot be adjusted.**
- **If 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. Jack, hand tools and mats are in designated positions.

PRELIMINARY CHECK

Check the following:

- Tires for improper pressure and wear.
- Wheel bearing axial end play. Refer to FAX-5, "Inspection".
- Transverse link or upper link ball joint axial end play.
- Shock absorber operation.
- Each mounting part of axle and suspension for looseness and deformation.
- Each of front 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). **Do not use these indicators.**
  - The alignment specifications programmed into your machine that operate these indicators may not be correct.
  - This may result in an ERROR.
- See instructions in the alignment machine.

Adjustment

INFOID:0000000009163820

CAUTION:

- **This work is recommended to be performed by GT-R certified NISSAN dealer.**
- **Adjust wheel alignment with the vehicle in customer's regular use condition (e.g. normal stock items), with the fuel in full-tank condition, and with no one in the vehicle.**
- **To adjust wheel alignment, set tire pressure at 250 kPa (2.5 kg/cm^2, 36 psi). After adjusting wheel alignment, adjust tire pressure to the specified value. Refer to WT-13, "Tire".**

TOE-IN

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

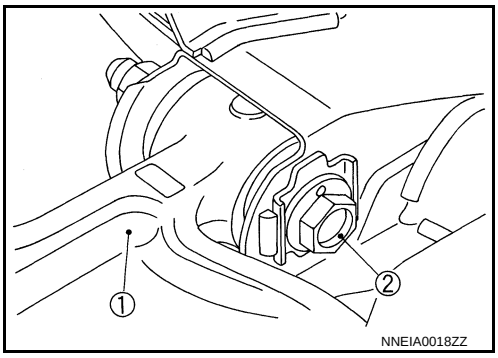
Toe-in **: Refer to FSU-15, "EXCEPT TRACK PACK-SPECIFIC SUSPENSION : Wheel Alignment" (Except track pack-specific suspension), FSU-16, "TRACK PACK-SPECIFIC SUSPENSION : Wheel Alignment" (Track pack-specific suspension).**

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.**
- **Always adjust to toe-in. The toe changes, depending on an attitude change or a permanent set of bush. Accordingly, the state of the front wheels change to toe-out and the rear wheels, toe-in. If the wheels change to toe-out, tire partial wear is accelerated and local heating may be accelerated in the inner side of tires.**
- **Always adjust toe-in to 1.5 mm (0.059 in) or less because too much toe-in may promote local heat generation.**
- **Engaging in performance driving on a racetrack and ultra-high-speed driving, be sure to adjust toe-in to 1.5 mm (0.059 in) or less. If used beyond this range, it is not covered by the warranty.**

CAMBER

Loosen the mounting nut of transverse link (1) and front suspension member, and then adjust using adjust bolt (2).



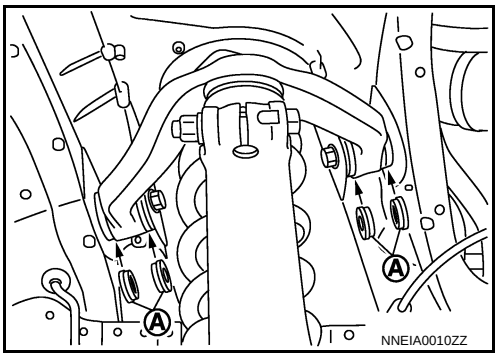
Camber **: Refer to FSU-15, "EXCEPT TRACK PACK-SPECIFIC SUSPENSION : Wheel Alignment" (Except track pack-specific suspension), FSU-16, "TRACK PACK-SPECIFIC SUSPENSION : Wheel Alignment" (Track pack-specific suspension).**

CAUTION:

Always hold the adjust bolt firmly when tightening nut.

CASTER

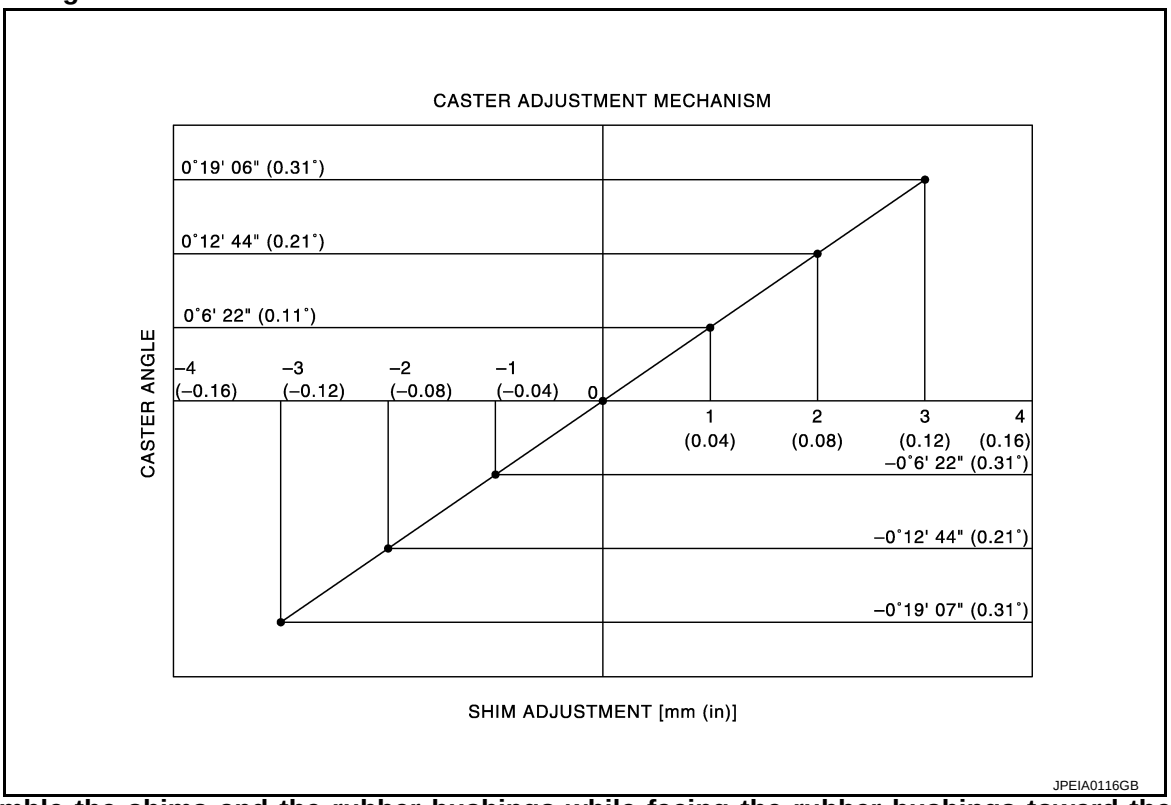
Remove the upper link mounting bolts (body side), and then adjust them using the thickness (increasing and decreasing) of shims (A).



Caster **: Refer to FSU-15, "EXCEPT TRACK PACK-SPECIFIC SUSPENSION : Wheel Alignment" (Except track pack-specific suspension), FSU-16, "TRACK PACK-SPECIFIC SUSPENSION : Wheel Alignment" (Track pack-specific suspension).**

CAUTION:

- **Refer to figure for selection of shim.**



- **Assemble the shims and the rubber bushings while facing the rubber bushings toward the upper link side.**

NOTE:

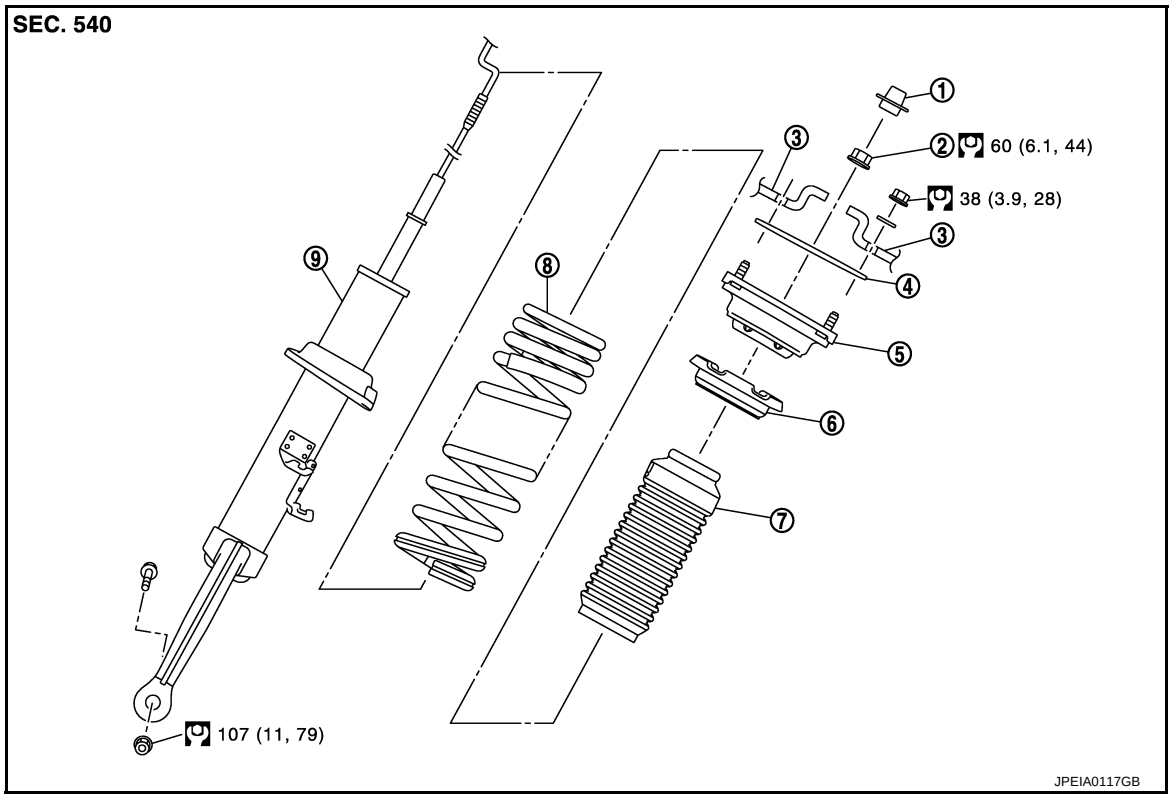
The shims and rubber bushings are fitted on a new vehicle [shim: 3 mm (0.12 in)] are a single unit. However the shims for adjustment and rubber bushings are separated parts. When shim: 6 mm (0.24in) is selected, fix it on one side only.

REMOVAL AND INSTALLATION

FRONT COIL SPRING AND SHOCK ABSORBER

Exploded View

INFOID:0000000009163821



1. Cap
2. Piston rod lock nut
3. Vehicle body
4. Mounting seal
5. Mount insulator
6. Rubber seat
7. Bound bumper
8. Coil spring*
9. Shock absorber

*: To replace, all of four coil springs must be replaced together as a set. (Vehicles with track pack-specific suspension)

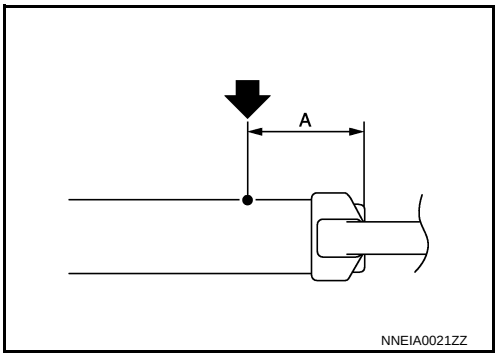
Refer to GI-4, "Components" for the symbols in the figure.

Disposal

INFOID:0000000009163825

1. 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.



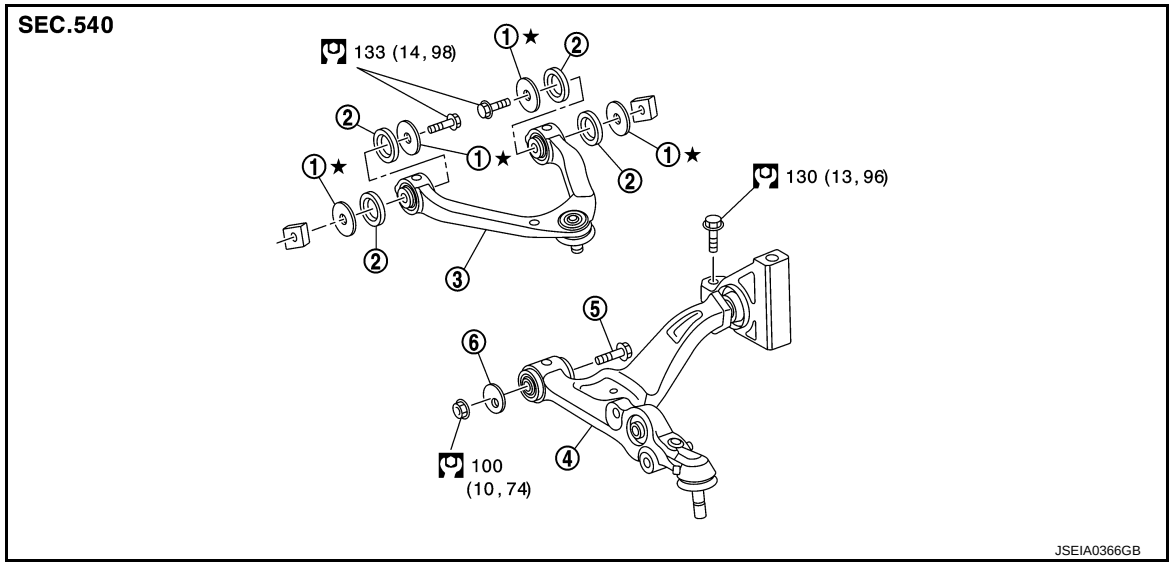
A : 20 – 30 mm (0.79 – 1.18 in)

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.

TRANSVERSE LINK

Exploded View

INFOID:0000000009163826



1. Shim*
2. Rubber bushing
3. Upper link
4. Transverse link
5. Adjusting bolt
6. Eccentric disk

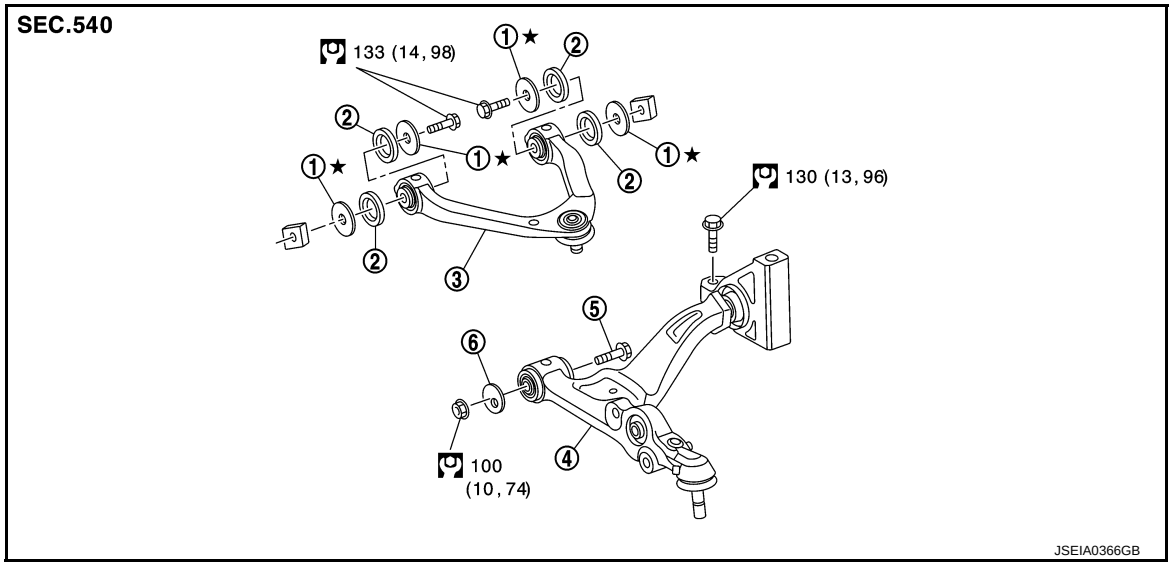
Refer to GI-4, "Components" for the symbols in the figure.

*: The shims and rubber bushings are fitted on a new vehicle [shim: 3 mm (0.12 in)] are a single unit. However the shims for adjustment and rubber bushings are separated parts. When shim: 6 mm (0.24in) is selected, fix it on one side only.

UPPER LINK

Exploded View

INFOID:0000000009163829



1. Shim*
2. Rubber bushing
3. Upper link
4. Transverse link
5. Adjusting bolt
6. Eccentric disk

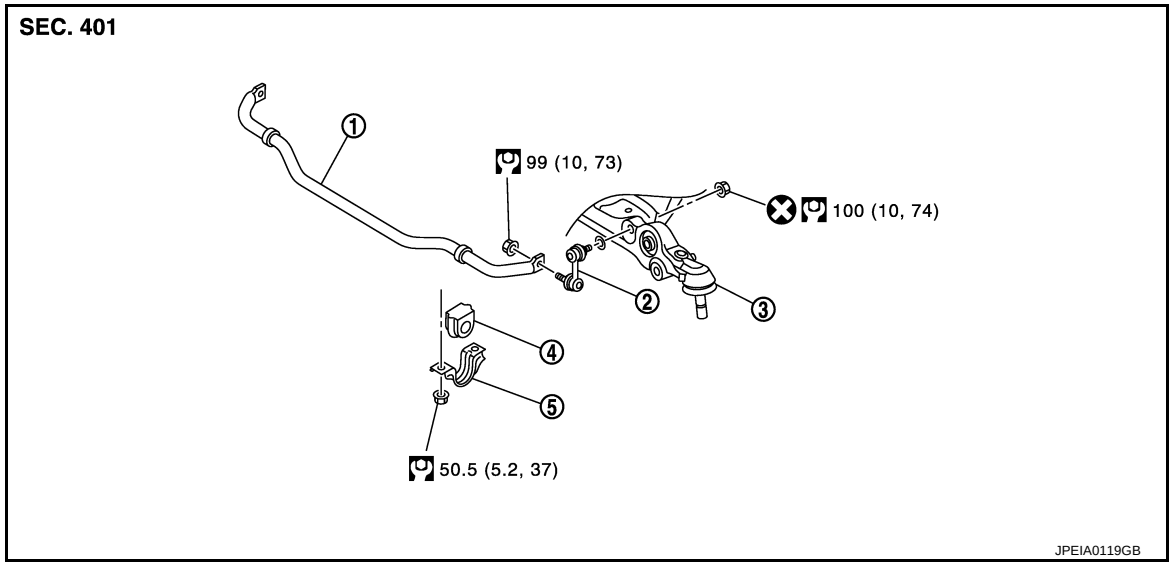
Refer to GI-4, "Components" for the symbols in the figure.

*: The shims and rubber bushings are fitted on a new vehicle [shim: 3 mm (0.12 in)] are a single unit. However the shims for adjustment and rubber bushings are separated parts. When shim: 6 mm (0.24in) is selected, fix it on one side only.

FRONT STABILIZER

Exploded View

INFOID:0000000009163832



1. Stabilizer bar
2. Stabilizer connecting rod
3. Transverse link
4. Stabilizer bushing
5. Stabilizer clamp

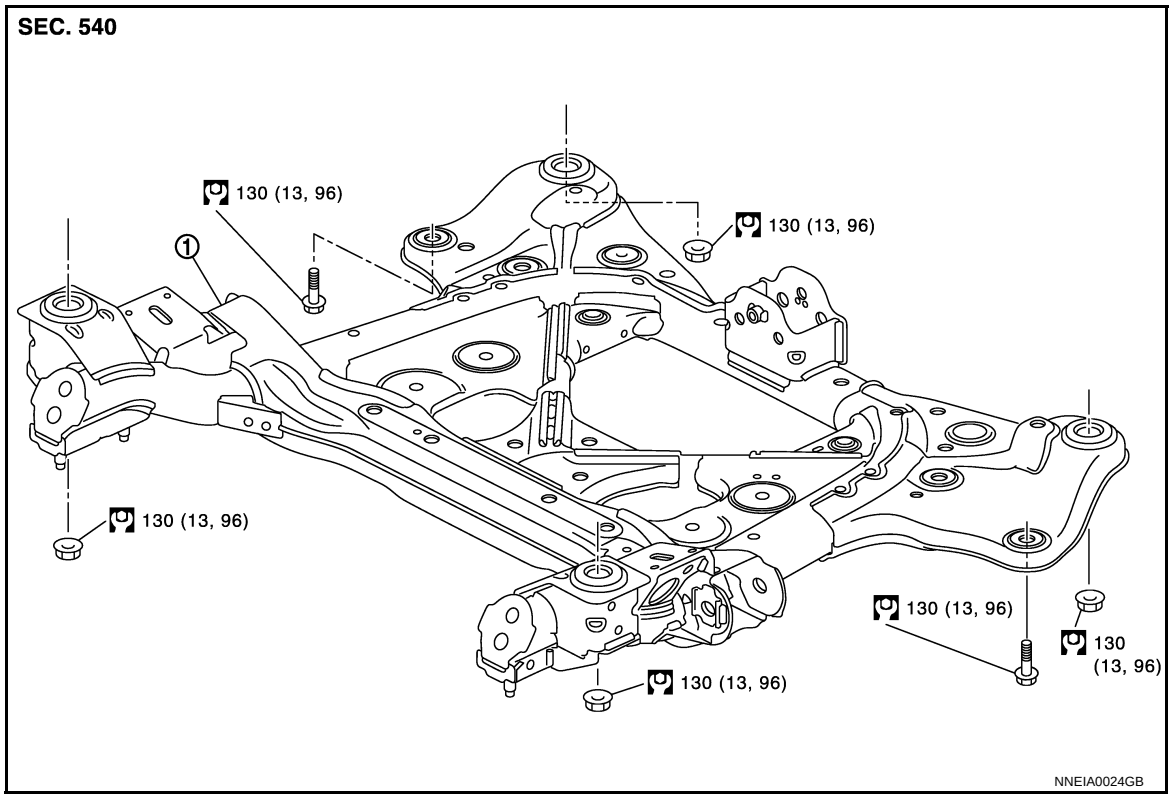
Refer to GI-4, "Components" for the symbols in the figure.

UNIT REMOVAL AND INSTALLATION

FRONT SUSPENSION MEMBER

Exploded View

INFOID:0000000009163835



1. Front suspension member

Refer to GI-4, "Components" for symbols in the figure.

SERVICE DATA AND SPECIFICATIONS (SDS)

SERVICE DATA AND SPECIFICATIONS (SDS)

EXCEPT TRACK PACK-SPECIFIC SUSPENSION

EXCEPT TRACK PACK-SPECIFIC SUSPENSION : Wheel Alignment

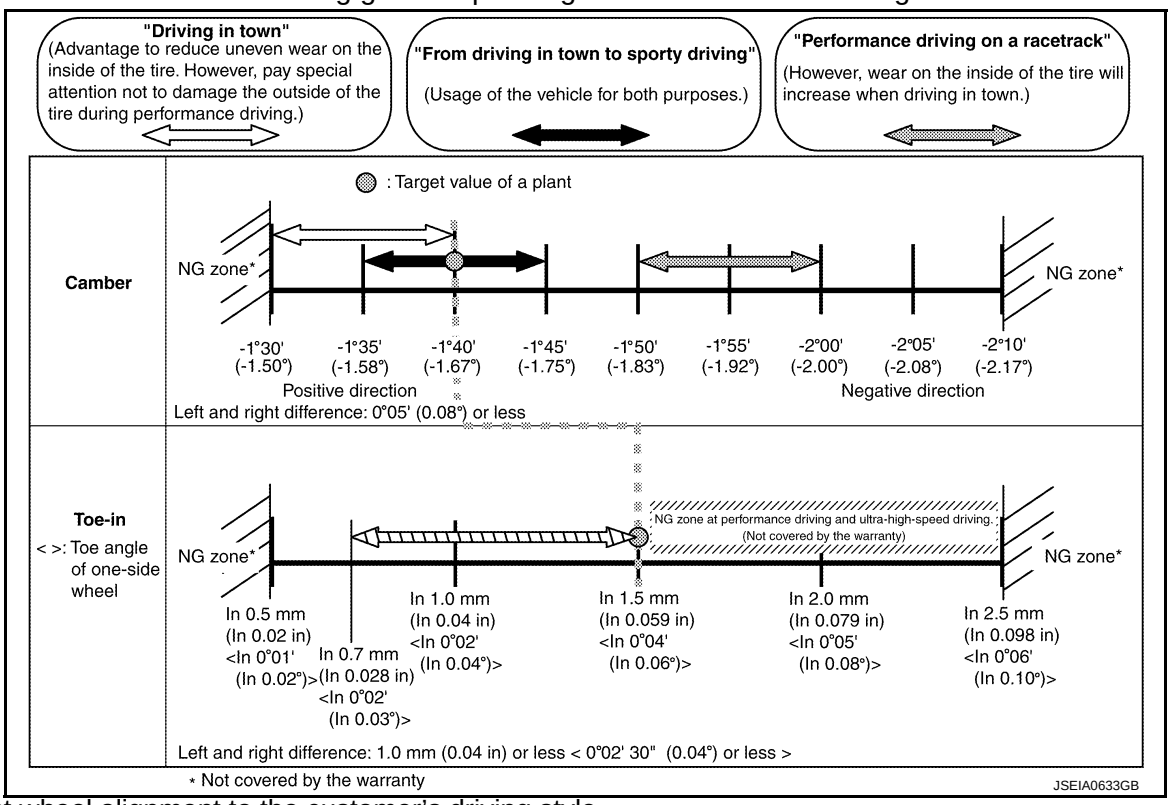
INFOID:0000000009163838

CAUTION:

- **This work is recommended to be performed by GT-R certified NISSAN dealer.**
- **Adjust wheel alignment with the vehicle in customer's regular use condition (e.g. normal stock items), with the fuel in full-tank condition, and with no one in the vehicle.**
- **To adjust wheel alignment, set tire pressure at 250 kPa (2.5 kg/cm^2, 36 psi). After adjusting wheel alignment, adjust tire pressure to the specified value. Refer to WT-13, "Tire".**

CAMBER, TOE-IN

Setting guide depending on the customer’s driving



- Adjust wheel alignment to the customer’s driving style.
- Never set to toe-out.
  - Always adjust to toe-in. If the wheels change to toe-out, tire partial wear is accelerated and local heating may be accelerated in the inner side of tires.
  - Always adjust toe-in to 1.5 mm (0.059 in) or less because too much toe-in may promote local heat generation.
  - For the above reasons, always adjust to toe-in for the vehicle of a customer who drives on a racetrack.
  - Engaging in performance driving on a racetrack and ultra-high-speed driving, be sure to adjust toe-in to 1.5 mm (0.059 in) or less. If used beyond this range, it is not covered by the warranty.
- When driving on a racetrack, recommend to adjust the alignment to the “Performance driving on a racetrack” setting. If the negative camber angle is insufficient driving on a technical course including many tight turns may result in wear on the outside of the tire and this can cause an accident. [To avoid uneven wear, servicing the vehicle after performance driving (at the customer's expense) is recommended to result the alignment to the original setting.]
- Wheel alignment can be changed in process of time and mileage, as suspension parts do not adjust to each other up to the mileage of about 1,000 miles or 2,000 km.
- Remarks for up to the mileage of 1,000 miles or 2,000 km
  - Camber angle NG zone (positive side): –1°20′ (–1.33°)

- Toe angle of one-side wheel: See reference value.

CASTER, KINGPIN INCLINATION

Item		Standard
Caster Degree minute (Decimal degree)	Minimum	5° 40′ (5.67°)
	Nominal	6° 00′ (5.00°)
	Maximum	6° 40′ (6.66°)
	Left and right difference	0° 30′ (0.50°) or less
Kingpin inclination Degree minute (Decimal degree)	Minimum	9° 20′ (9.34°)
	Nominal	9° 30′ (9.50°)
	Maximum	9° 40′ (9.66°)

Measure value under unladen* conditions.

*: Fuel, engine coolant and lubricant are full. Jack, hand tools and mats are in designated positions.

- Wheel alignment can be changed in process of time and mileage, as suspension parts do not adjust to each other up to the mileage of about 1,000 miles or 2,000 km.

TRACK PACK-SPECIFIC SUSPENSION

TRACK PACK-SPECIFIC SUSPENSION : Wheel Alignment

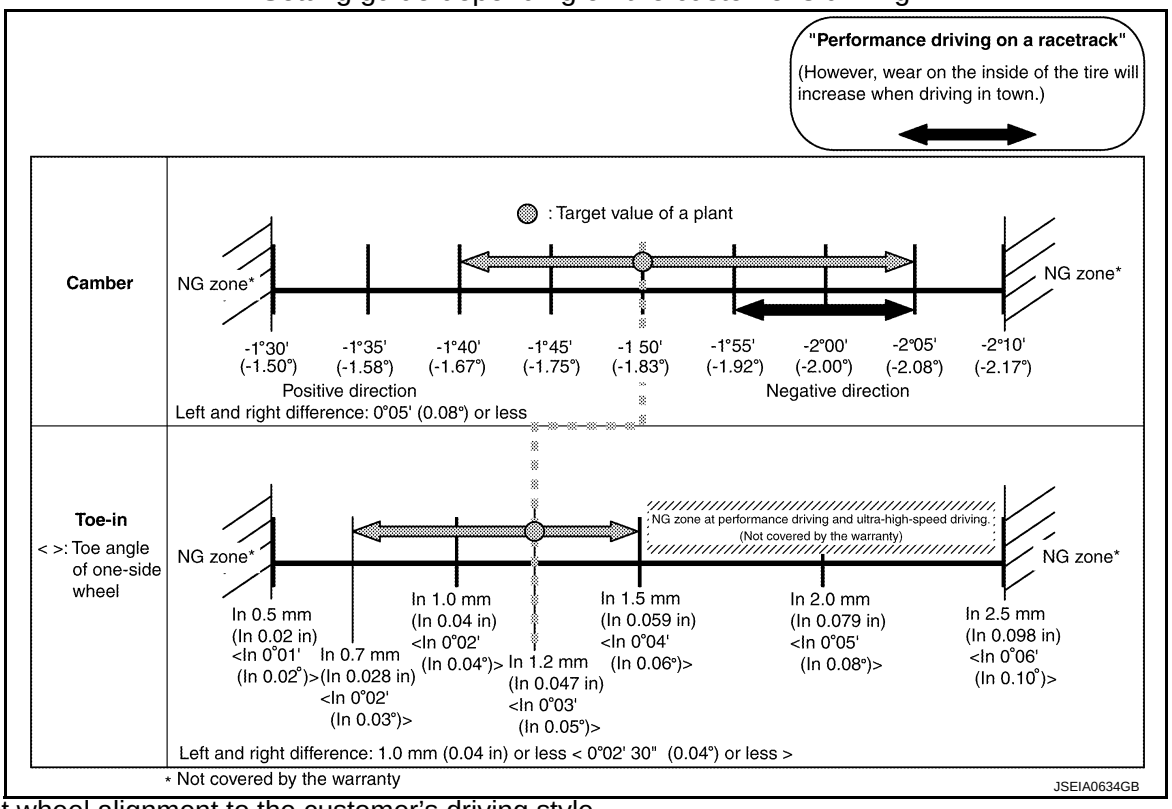
INFOID:0000000009163839

CAUTION:

- **This work is recommended to be performed by GT-R certified NISSAN dealer.**
- **Adjust wheel alignment with the vehicle in customer's regular use condition (e.g. normal stock items), with the fuel in full-tank condition, and with no one in the vehicle.**
- **To adjust wheel alignment, set tire pressure at 250 kPa (2.5 bar, 2.5 kg/cm^2, 36 psi). After adjusting wheel alignment, adjust tire pressure to the specified value. Refer to WT-13, "Tire".**

CAMBER, TOE-IN

Setting guide depending on the customer’s driving



- Adjust wheel alignment to the customer’s driving style.
- Never set to toe-out.

- Always adjust to toe-in. If the wheels change to toe-out, tire partial wear is accelerated and local heating may be accelerated in the inner side of tires.
- Always adjust toe-in to 1.5 mm (0.059 in) or less because too much toe-in may promote local heat generation.
- For the above reasons, always adjust to toe-in for the vehicle of a customer who drives on a racetrack.
- Engaging in performance driving on a racetrack and ultra-high-speed driving, be sure to adjust toe-in to 1.5 mm (0.059 in) or less. If used beyond this range, it is not covered by the warranty.

• Insufficient negative camber during hard cornering on a racetrack may result in tire wear. Therefore, recommend the customer to adjust negative camber angle in the negative direction when driving on a racetrack. [To avoid uneven wear, recommend the customer to have the camber angle aligned in the positive direction at an inspection after performance driving (at customer's expense).]
• Wheel alignment can be changed in process of time and mileage, as suspension parts do not adjust to each other up to the mileage of about 1,000 miles or 2,000 km.
• Remarks for up to the mileage of 1,000 miles or 2,000 km

- Toe angle of one-side wheel: See reference value.

• Each part of the suspension may not conform during a normal driving because of the adoption of a hard rate coil spring and a high damping shock absorber.

CASTER, KINGPIN INCLINATION

Item		Standard
Caster Degree minute (Decimal degree)	Minimum	5° 45′ (5.75°)
	Nominal	6° 05′ (6.08°)
	Maximum	6° 45′ (6.75°)
	Left and right difference	0° 30′ (0.50°) or less
Kingpin inclination Degree minute (Decimal degree)	Minimum	9° 30′ (9.50°)
	Nominal	9° 40′ (9.67°)
	Maximum	9° 50′ (9.83°)

Measure value under unladen* conditions.

*: Fuel, engine coolant and lubricant are full. Jack, hand tools and mats are in designated positions.

• Wheel alignment can be changed in process of time and mileage, as suspension parts do not adjust to each other up to the mileage of about 1,000 miles or 2,000 km.
• Each part of the suspension may not conform during a normal driving because of the adoption of a hard rate coil spring and a high damping shock absorber.