

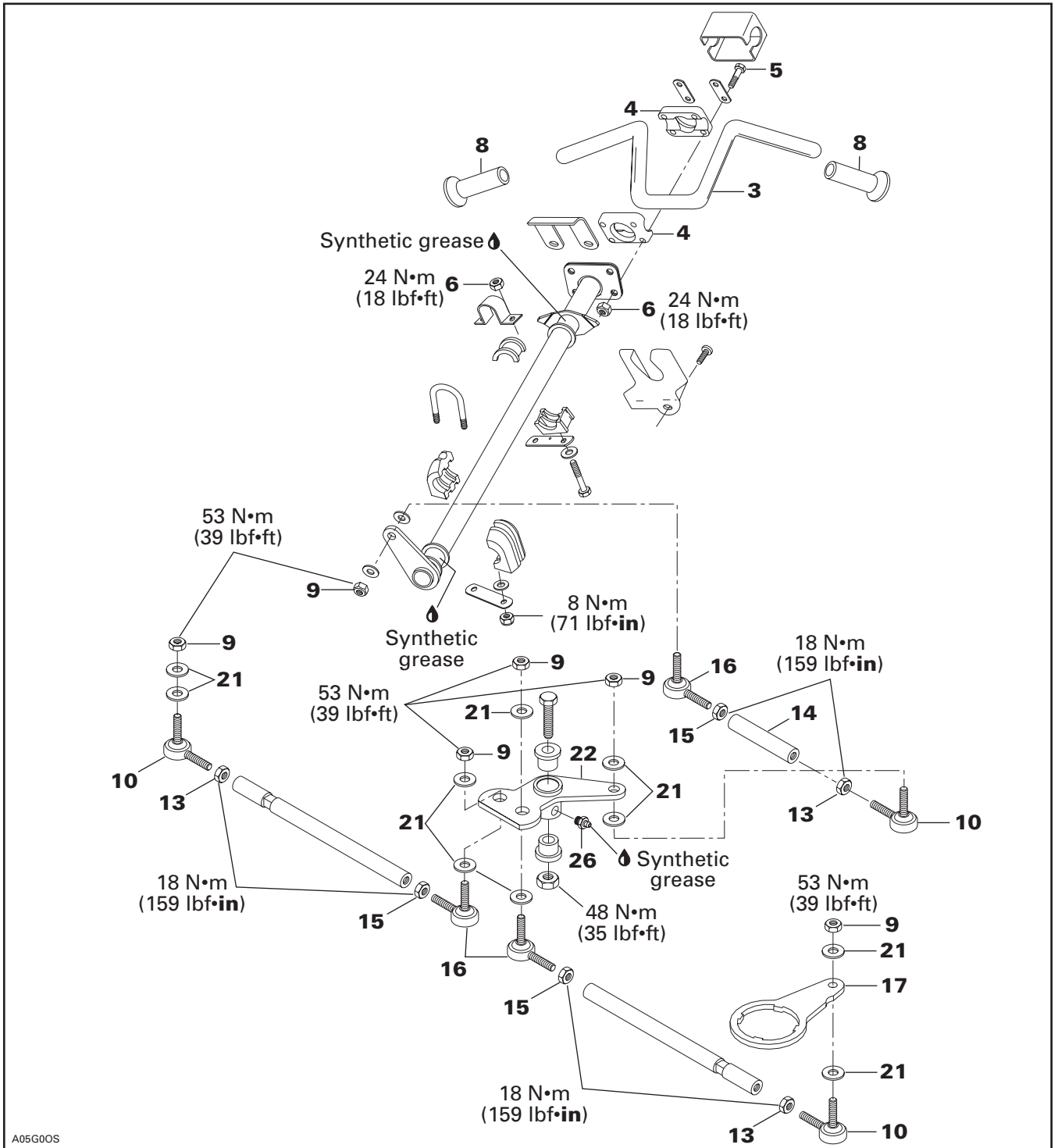
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STEERING SYSTEM

Tundra R

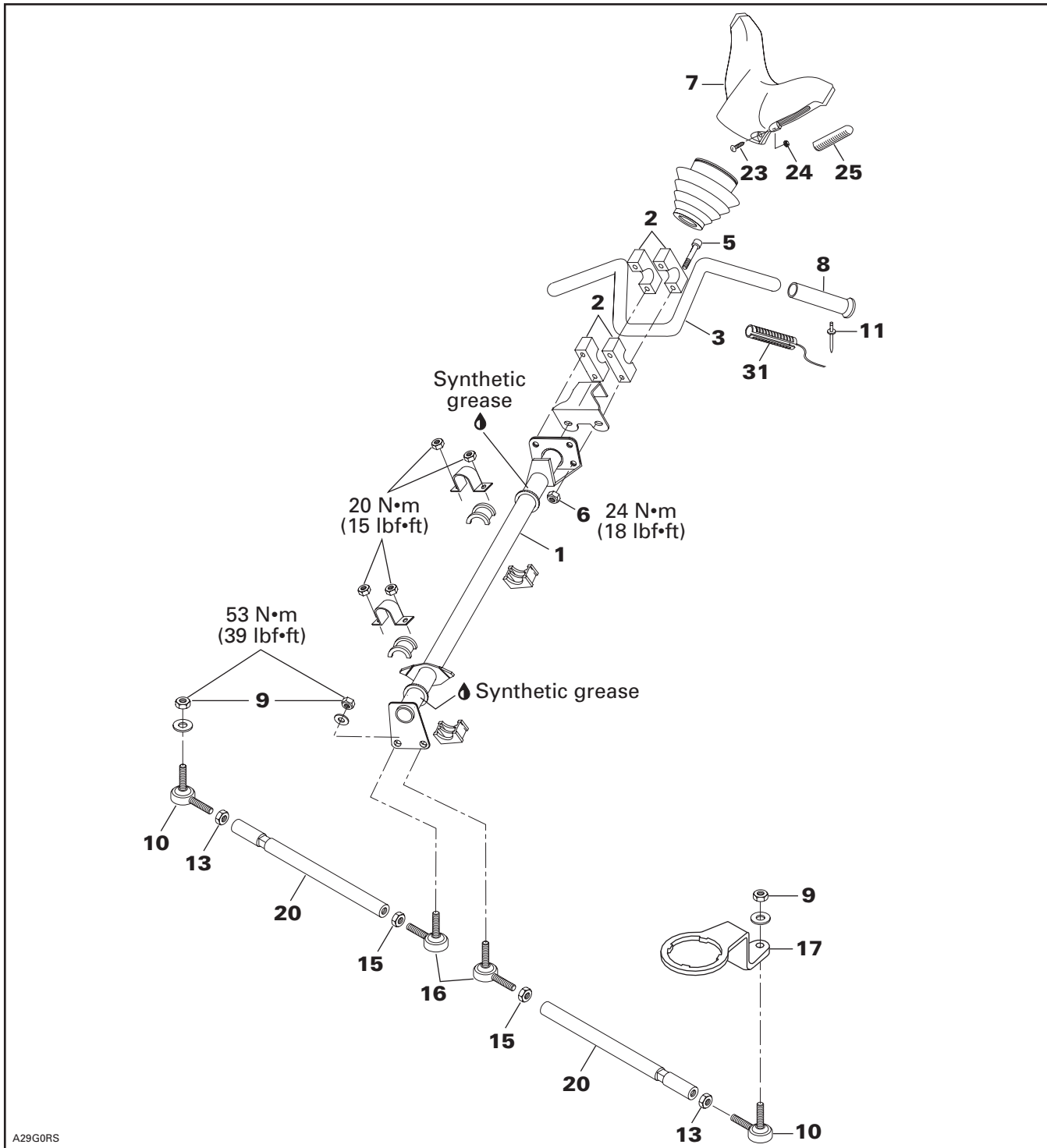


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Section 08 STEERING/FRONT SUSPENSION

Subsection 02 (STEERING SYSTEM)

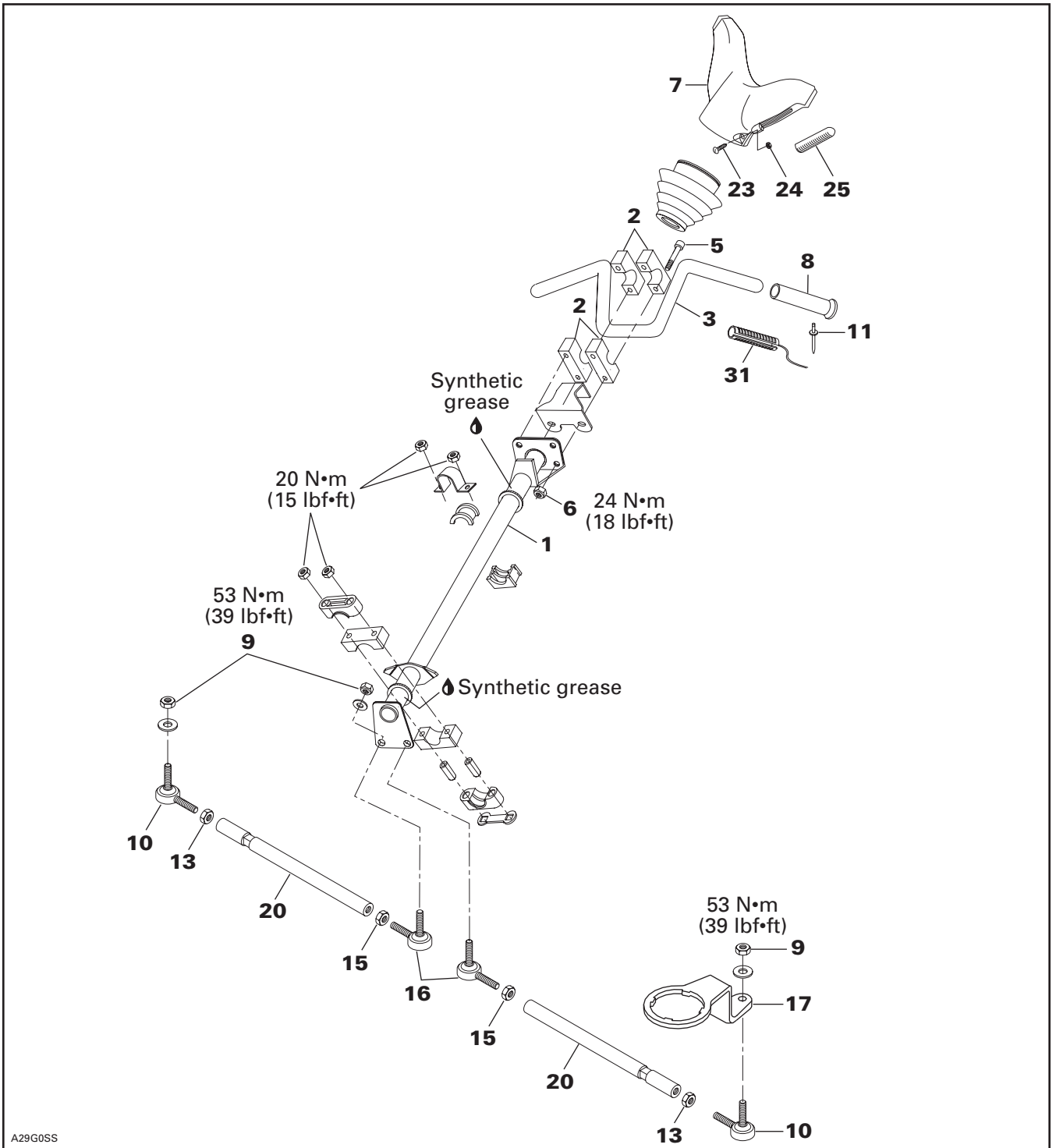
Skandic LT/LT E



Section 08 STEERING/FRONT SUSPENSION

Subsection 02 (STEERING SYSTEM)

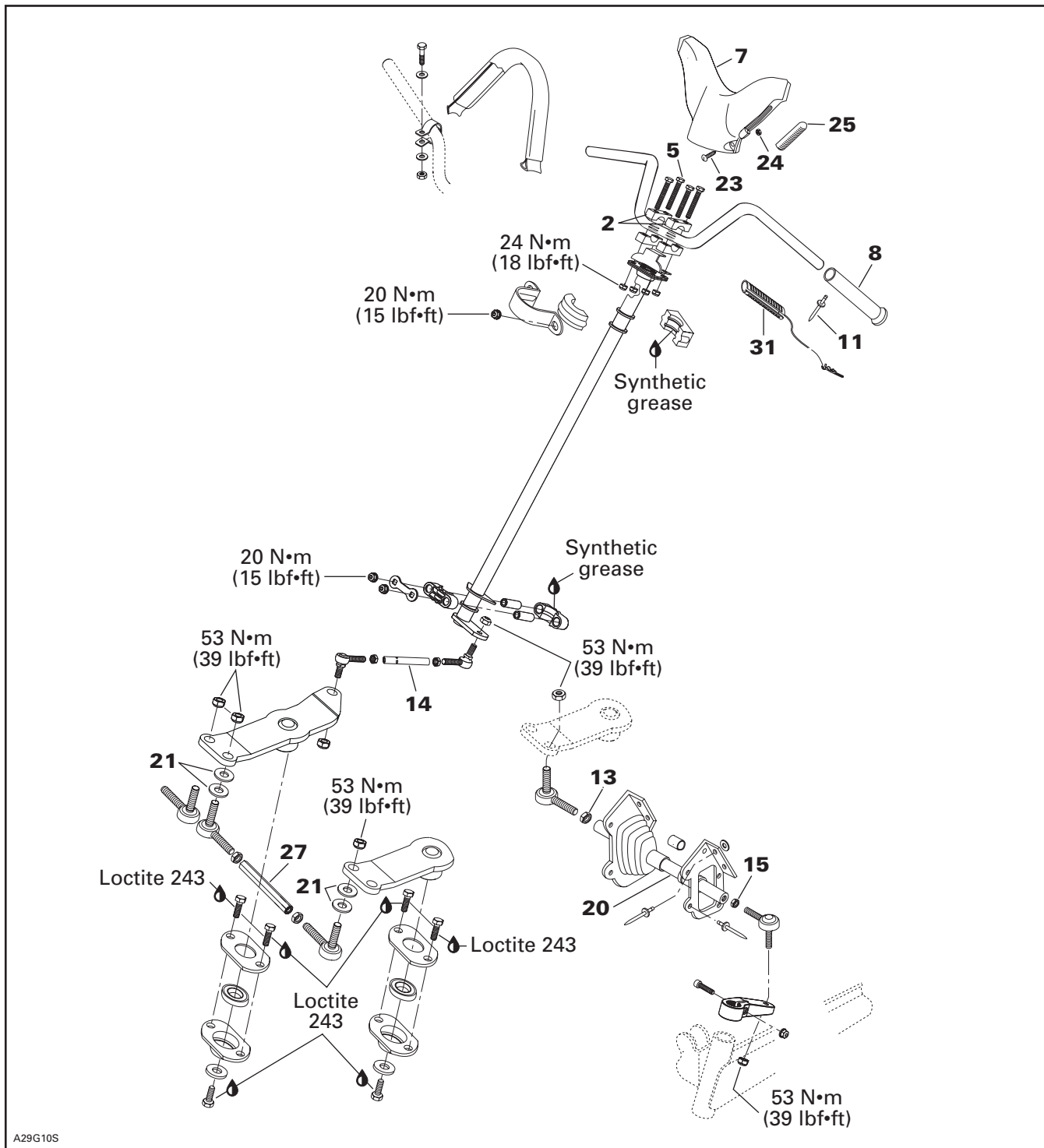
Skandic WT/SWT/WT LC



Section 08 STEERING/FRONT SUSPENSION

Subsection 02 (STEERING SYSTEM)

Skandic SUV



A29G10S

INSPECTION

Check skis and ski runner for wear, replace as necessary. Refer to STEERING SYSTEM.

17, Steering Arm and Ski Leg

Make sure steering arm and ski leg splines interlock without excessive play.

WARNING

Any parts having worn splines have to be replaced with new ones.

Check steering system components for wear. Replace if necessary.

31, Heating Grip Element

To test heating elements, refer to TESTING PROCEDURE.

10,16, Ball Joint (left hand and right hand threads)

Inspect ball joint ends for wear or looseness, if excessive, replace them.

DISASSEMBLY AND ASSEMBLY

8, Grip

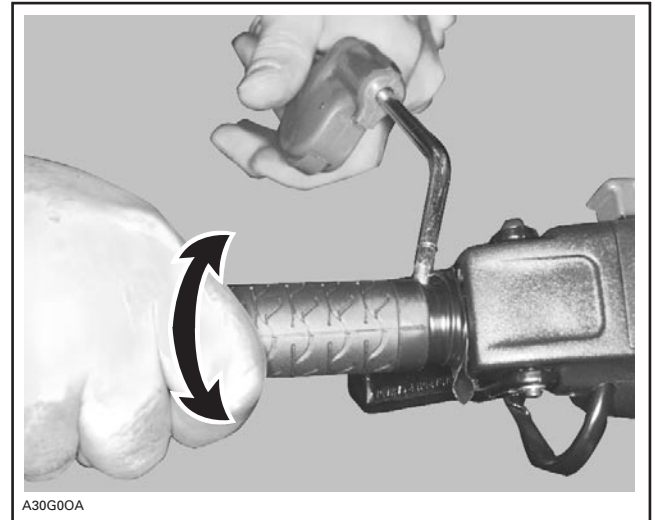
Grips must be carefully removed to prevent damaging the heating elements.

Remove rivet no. 11 if applicable.

Heat grip with a heat gun.

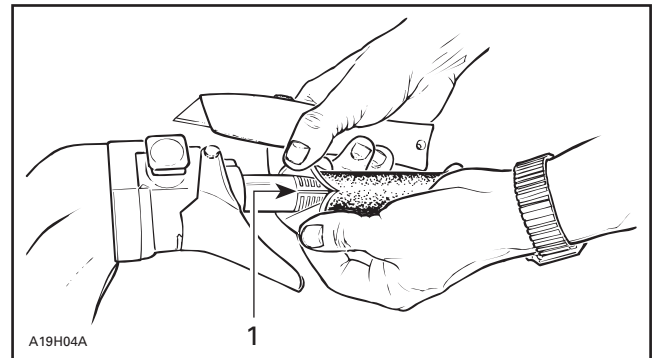
Apply tape to handlebar near the grip to protect paint.

Inject compressed air into the handlebar and twist grip when pulling it out.



The grips might be unremovable as explained above, in this case, carefully proceed as follows to prevent damaging the heating elements.

Start cutting and immediately peel it open to locate the gap in the heating element, as shown.



TYPICAL

1. Gap in the heating element opposite the wires

Continue cutting along the gap and remove the grip. If required, slowly peel heating element no. 31 from handlebar and remove it.

To install, stick the heating element to the handlebar making sure the wires do not interfere with operation of the accelerator or brake handle.

Section 08 STEERING/FRONT SUSPENSION

Subsection 02 (STEERING SYSTEM)

⚠ WARNING

Never use lubricants (e.g. oil, grease, etc.) to install the handlebar grip. Only use a mix of soap and water. Mix 40 parts of water with one part of dish washing soap (recommended: Ultra Joy, Sunlight or Palmolive).

Heat the grip with a heater gun or a spot light to ease installation. Insert new grip with compressed air.



Install rivet no. 11 if applicable.

1, Steering Column

Remove steering pad then handlebar ass'y.

Detach tie rod(s) from the steering column.

To gain access to lower U-clamp, remove the air intake silencer and carburetor(s).

Skandic Models Only

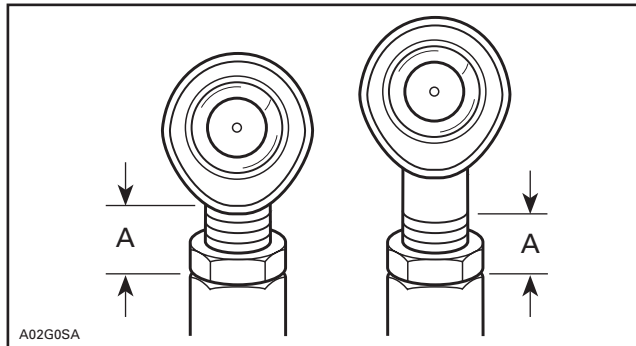
Loosen rear engine fastening screws.

All Models

Remove U-clamps then steering column.

10,16, Ball Joint (left hand and right hand threads)

Screw threaded end of the ball joint into the tie rod. The maximum external threaded length not engaged in the tie rod must not exceed 20 mm (25/32 in).

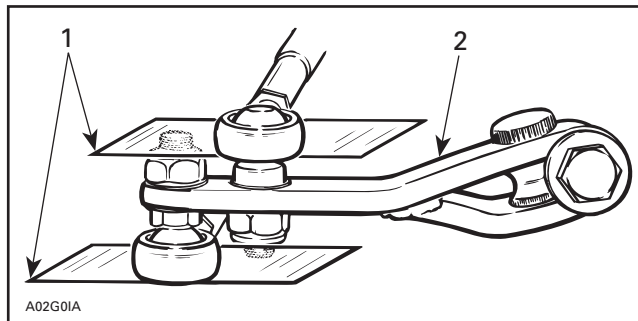


TYPICAL

A. 20 mm (25/32 in) maximum

The ball joint should be restrained when tightening the tie rod end lock nut. Align it so the tie rod end is parallel to the steering arm when assembled on the vehicle, refer to the following illustration.

For proper torque specifications refer to the specific exploded view for the vehicle being serviced.



TYPICAL

1. Parallel with steering arm
2. Steering arm

⚠ WARNING

The cut off section of the ball joint must run parallel with the steering arm. When tightening lock nuts, restrain ball joint with appropriate size wrench. The maximum external threaded length not engaged in the tie rod must not exceed 20 mm (25/32 in).

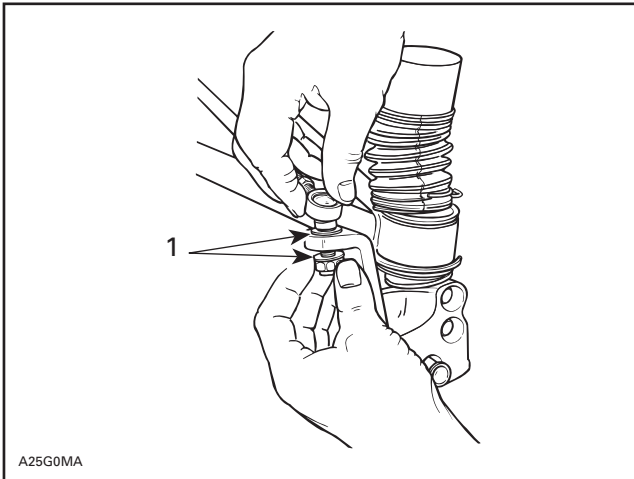
Section 08 STEERING/FRONT SUSPENSION

Subsection 02 (STEERING SYSTEM)

21, Hardened Washer on Ball Joint Stud

Tundra R and Skandic SUV

Install a hardened washer on each side of the arm.



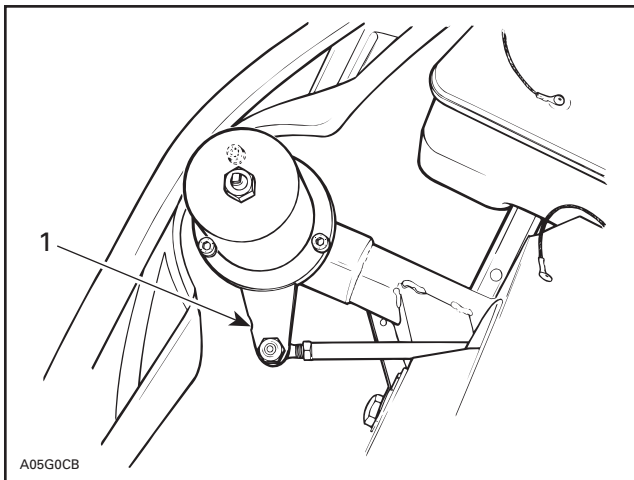
TYPICAL

1. Hardened washers

17, Steering Arm

Tundra R

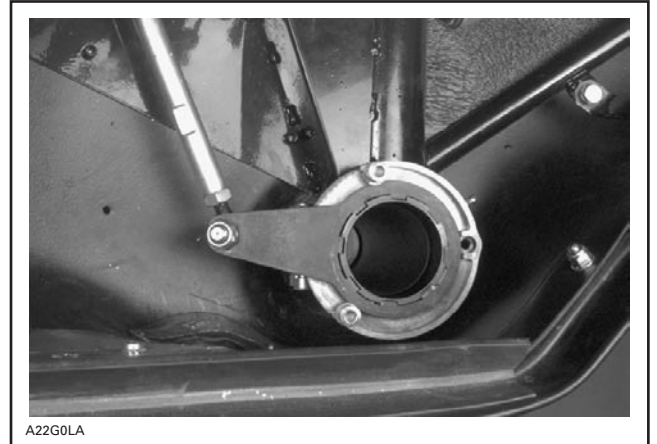
Steering arm notch must face outside of vehicle.



1. Notch facing outside

Skandic LT/LT E/WT/SWT/WT LC

Install steering arm at mid-travel position when handlebar and skis are facing straight ahead.



TYPICAL

Skandic SUV

Steering arm must be installed parallel to ski.

9,13,15, Ball Joint Nut and Jam Nut

Tighten ball joint nuts and jam nuts to specified torque (see exploded view).

HANDLEBAR POSITION ADJUSTMENT

All Models

Remove steering pad. Loosen 4 nuts on steering clamps **no. 2**.

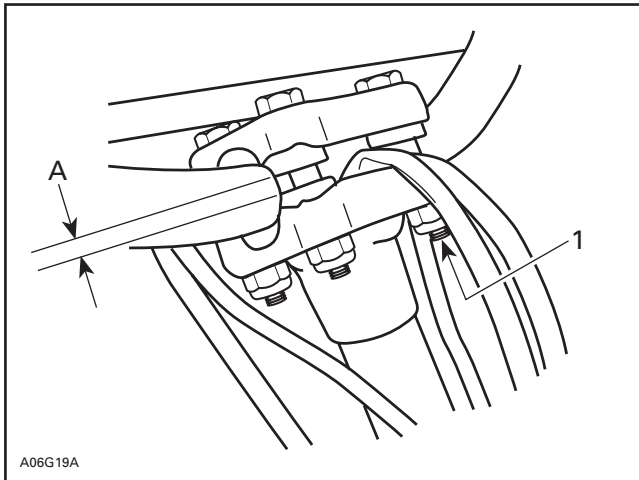
Adjust the steering handlebar to the desired position.

Lock the handlebar in place by tightening the 4 nuts as specified in the illustrations.

CAUTION: Tighten the nuts equally in a criss-cross sequence and ensure there is an equal gap on each side of the clamps **no. 2**.

Section 08 STEERING/FRONT SUSPENSION

Subsection 02 (STEERING SYSTEM)



TYPICAL

1. Torque to 24 N•m (18 lbf•ft)
- A. Equal gap all around

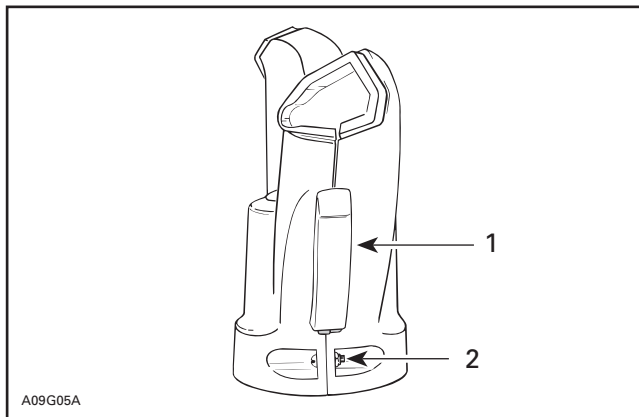
⚠ WARNING

Avoid contact between the brake handle and the windshield by **NOT** adjusting the handlebar too high.

Properly fit the steering pad to the handlebar. Assemble using the 2 rubber attachments, nuts and bolts where applicable.

⚠ WARNING

Make sure that the steering pad and all controls are properly fixed to their normal location on the handlebar.



TYPICAL

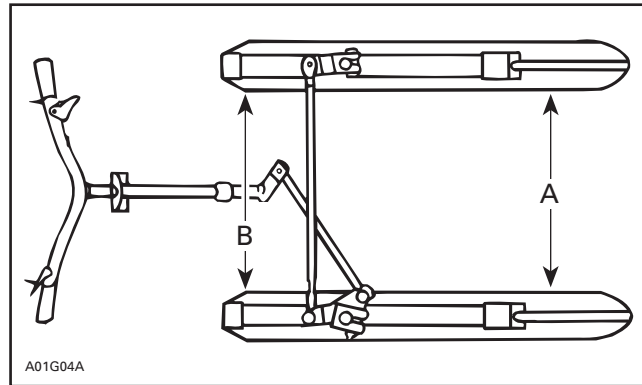
1. Rubber attachment
2. Nut and bolt (where applicable)

STEERING ADJUSTMENT (skis)

Definitions

TOE-OUT:

A difference measured between the front edge of the skis **A** and rear edge **B** as viewed from the top. It is adjustable.



CAMBER:

A specific inward or outward tilt angle of ski leg compared to a vertical line when viewing the vehicle from front. **This angle is not adjustable on any models.**

Adjustments

Tundra R

Adjustments should be performed following this sequence:

- Handlebar/pivot arm centering.
- Set toe-out adjustment.

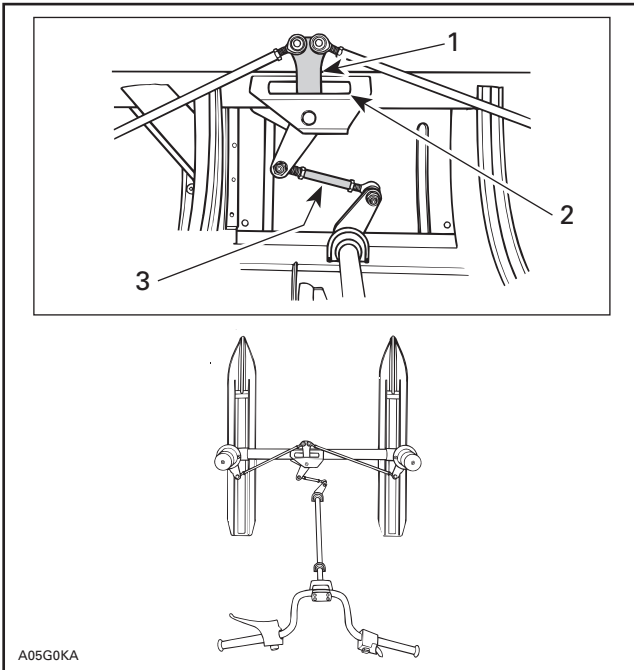
HANDLEBAR/PIVOT ARM CENTERING

Turn handlebar until pivot arm is well centered in slot of its bracket.

Check if handlebar is horizontal. To adjust, loosen lock nuts of short tie rod and turn it accordingly.

Section 08 STEERING/FRONT SUSPENSION

Subsection 02 (STEERING SYSTEM)

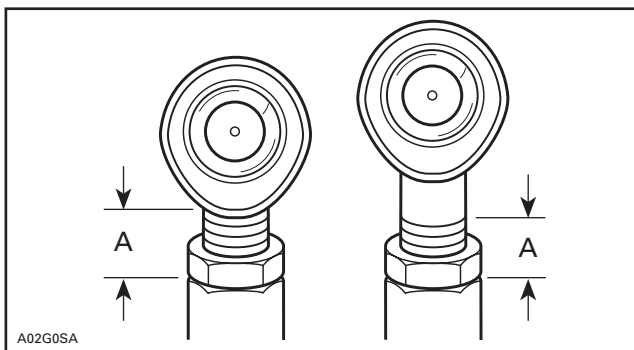


1. Pivot arm centered in slot
2. Slot
3. Turn to adjust

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⚠ WARNING

Maximum ball joint external threaded length not engaged in the tie rod end must not exceed 20 mm (25/32 in). Torque lock nut to 18 N•m (159 lbf•in).



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A. 20 mm (25/32 in) maximum

Restrain short tie rod while torquing nuts so that ball joint sockets run parallel with steering arm and pivot arm.

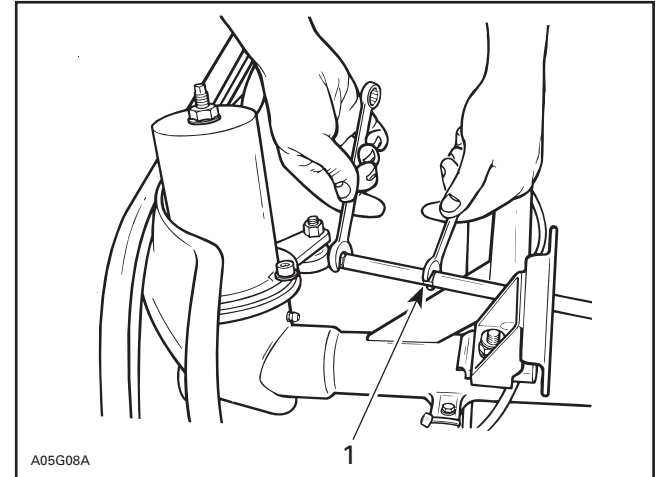
Ensure that pivot arm is still centered and check ski toe-out.

TOE-OUT ADJUSTMENT

Raise front of vehicle so that skis are off the ground.

Loosen lock nuts of long tie rods and turn each tie rod so that skis are in a straight ahead position. To adjust toe-out, slightly turn both tie rods exactly the same amount.

Make sure external threaded length not engaged is not too long and torque nuts as specified above.



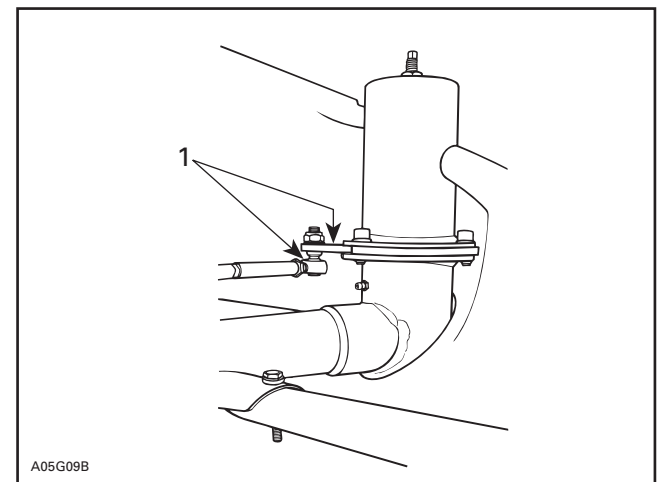
A05G08A

LONG TIE ROD SHOWN

1. Restrain tie rod to tighten lock nuts

⚠ WARNING

Ball joint sockets must run parallel with steering arm and pivot arm. Tie rod must be restrained when tightening lock nuts.



A05G09B

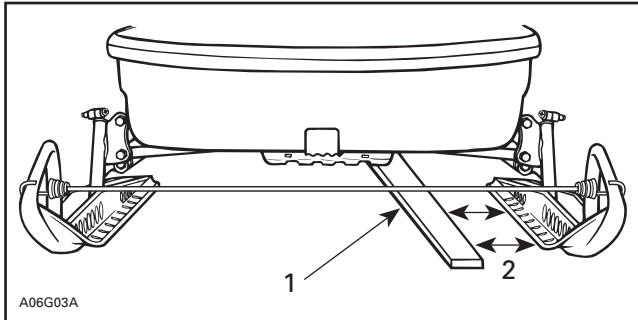
LONG TIE ROD SHOWN

1. Ball joint parallel with arm

Section 08 STEERING/FRONT SUSPENSION

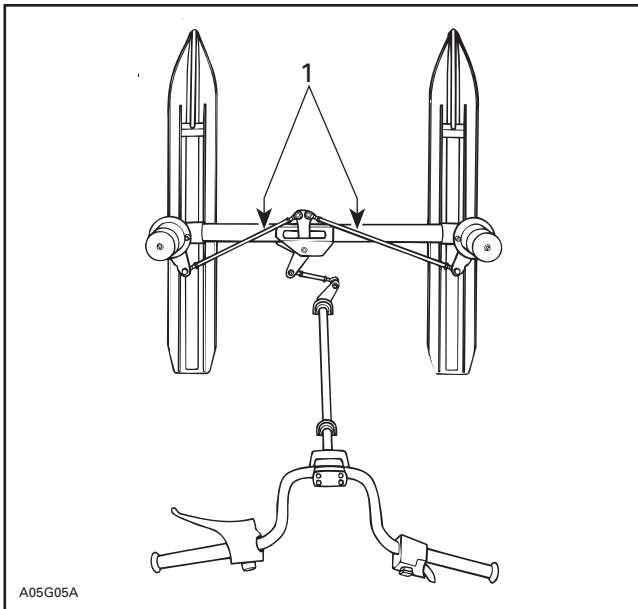
Subsection 02 (STEERING SYSTEM)

NOTE: To make sure skis are in straight-ahead position, place a straight edge against pre-adjusted track and measure distance between front and rear of skis and straight edge. Measurements are taken 200 mm (8 in) at rear and front of ski pivot bolt. Distances should be equal. After ski toe-out adjustment, distance at front of ski must be 3.0 mm (1/8 in) more than at rear on both sides for a total toe-out of 6 mm (1/4 in).



TYPICAL

1. Straight edge
2. 3.0 mm (1/8 in) more at front than at rear



1. Turn to adjust

WARNING

Do not attempt to adjust skis straight-ahead position by turning ball joint on tie rod **no. 14**.

Skandic SUV

Adjustments should be performed following this sequence:

- Handlebar/pivot arm positioning.
- Idler arm positioning.
- Set toe-out adjustment.

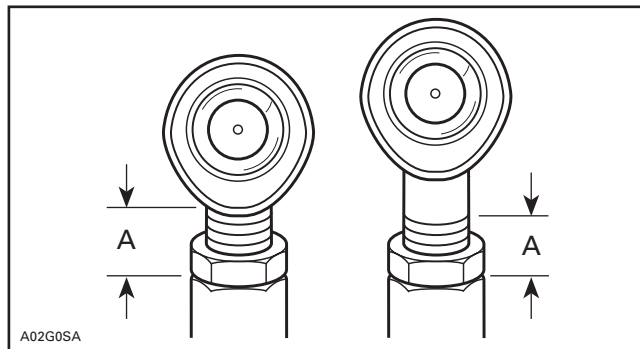
HANDLEBAR/PIVOT ARM POSITIONING

Turn handlebar until pivot arm is pointing straight forward.

Check if handlebar is horizontal. To adjust, loosen lock nuts of short tie rod and turn it accordingly.

WARNING

Maximum ball joint external threaded length not engaged in the tie rod end must not exceed 20 mm (25/32 in). Torque lock nut to 18 N•m (159 lbf•in).



- A. 20 mm (25/32 in) maximum

Restrain short tie rod while torquing nuts so that ball joint sockets run parallel with steering arm and pivot arm.

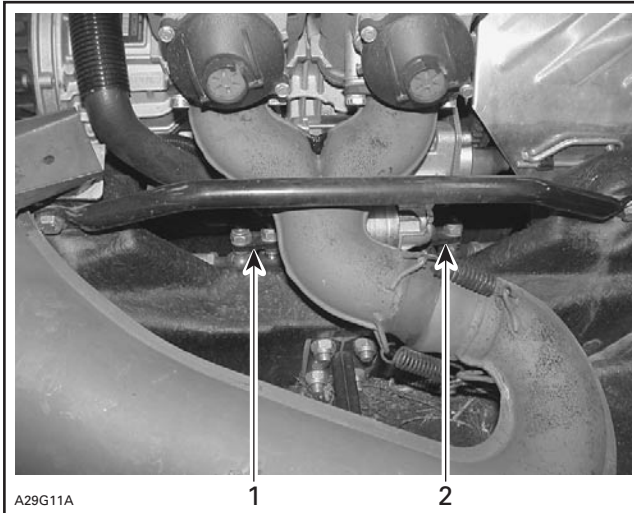
Ensure that pivot arm is still pointing straight forward and check ski toe-out.

Section 08 STEERING/FRONT SUSPENSION

Subsection 02 (STEERING SYSTEM)

IDLER ARM POSITIONING

With the pivot arm pointing straight forward, loosen lock nuts of idler arm tie rod and turn tie rod until idler arm is pointing straight forward too. With this adjustment properly done, turning radius will be the same on both sides.



1. Pivot arm pointing straight forward
2. Idler arm pointing straight forward too

TOE-OUT ADJUSTMENT

With the handlebar in straight ahead position, turn left and right tie rods no. 20 to obtain specified toe-out.

Procedure:

- Loosen jam nuts no. 13 and no. 15 of both tie rods no. 20.

WARNING

Never lengthen tie rod making threaded portion of ball joint exceed 20 mm (25/32 in).

- Close front of skis manually to take all free-play from steering mechanism.

NOTE: A rubber cord must be hooked in front of skis to keep them closed.

Skis should have a toe-out of 5 mm (3/16 in) when they are in a straight-ahead position and the vehicle is resting on the ground.

Measurements are taken 250 mm (10 in) at front and rear of ski pivot bolt.

NOTE: To make sure skis are in a straight-ahead position, place a straight edge against pre-adjusted track and measure the distance between front and rear of skis and straight edge. Distances should be equal. After the ski toe-out adjustment, distance at front of ski must be 2.5 mm (3/32 in) more than at rear on both sides for a total toe-out of 5 mm (3/16 in).

Skandic LT/LT E/WT/SWT/WT LC

Toe-out adjustment is performed by adjusting length of left and right tie rods no. 20. Handlebar centering is done at same time by turning tie rods accordingly.

Procedure:

- Loosen jam nuts no. 13 and no. 15 of both tie rods no. 20.

WARNING

Never lengthen tie rod making threaded portion of ball joint exceed 20 mm (25/32 in).

- Close front of skis manually to take all free-play from steering mechanism.

NOTE: A rubber cord must be hooked in front of skis to keep them closed.

Skis should have a toe-out of 5 mm (3/16 in) when they are in a straight-ahead position and the vehicle is resting on the ground.

Measurements are taken 250 mm (10 in) at front and rear of ski pivot bolt.

NOTE: To make sure skis are in a straight-ahead position, place a straight edge against pre-adjusted track and measure the distance between front and rear of skis and straight edge. Distances should be equal. After the ski toe-out adjustment, distance at front of ski must be 2.5 mm (3/32 in) more than at rear on both sides for a total toe-out of 5 mm (3/16 in).

Section 08 STEERING/FRONT SUSPENSION

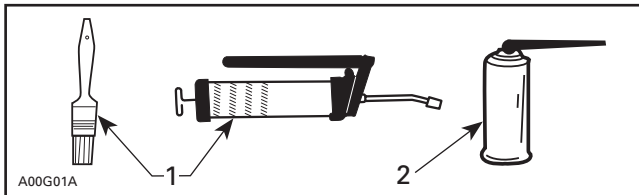
Subsection 02 (STEERING SYSTEM)

LUBRICATION

⚠ WARNING

Do not lubricate throttle and/or brake cable nor their housing.

The following symbols will be used to show what type of lubricant should be used at the suitable locations.



1. Synthetic grease (P/N 413 711 500)
2. Penetrating lubricant (P/N 293 600 016)

Tundra R

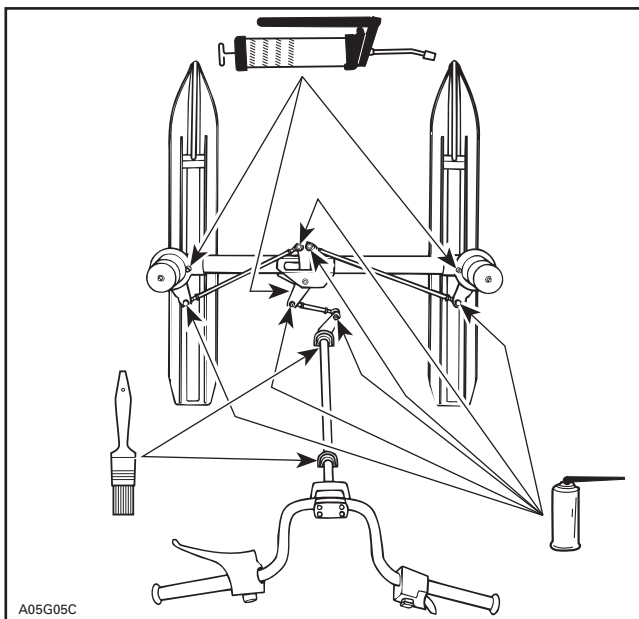
Lubricate front suspension posts and pivot arm at grease fittings. Pump five strokes of grease gun on each post. Use synthetic grease (P/N 413 711 500).

NOTE: There are 3 grease fittings.

Apply BOMBARDIER LUBE (P/N 293 600 016) to ball joints.

NOTE: There are 6 lubrication points.

Apply synthetic grease (P/N 413 711 500) to both steering column bushings.



TUNDRA R

Skandic LT/LT E/WT/SWT/WT LC

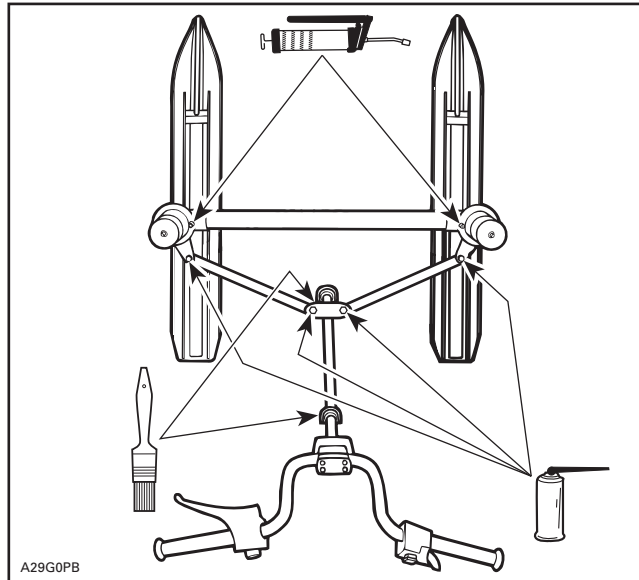
Lubricate front suspension posts. Pump five strokes of grease gun on each post. Use synthetic grease (P/N 413 711 500).

NOTE: There are 2 grease fittings.

Apply BOMBARDIER LUBE (P/N 293 600 016) to ball joints.

NOTE: There are 4 lubrication points.

Apply synthetic grease (P/N 413 711 500) to both steering column bushings.



SKANDIC LT/LT E/WT/SWT/WT LC

Skandic SUV

Lubricate ski legs. Pump five strokes of grease gun on each ski leg. Use synthetic grease (P/N 413 711 500).

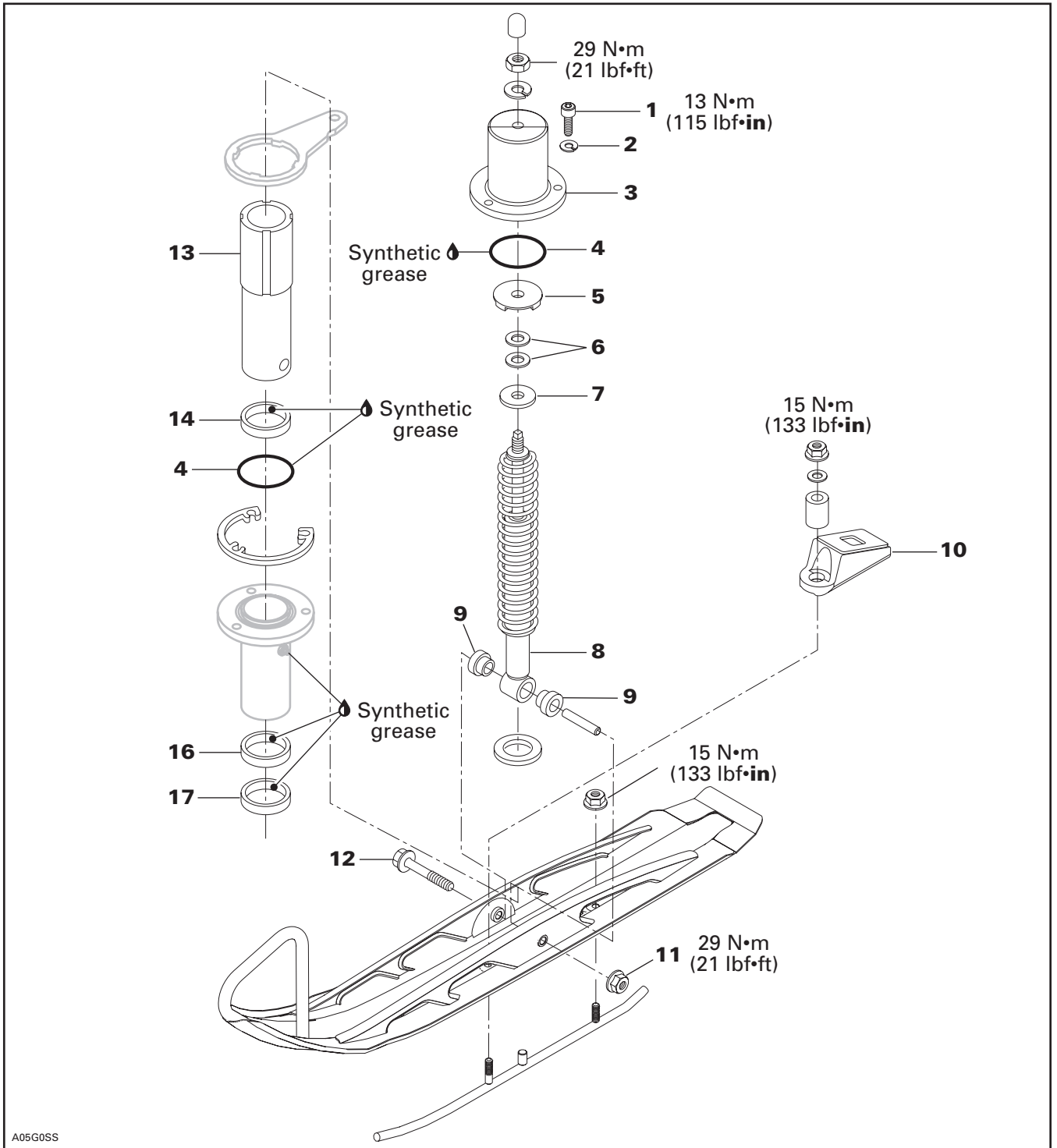
NOTE: There are 2 grease fittings.

Apply BOMBARDIER LUBE (P/N 293 600 016) to all ball joints.

Apply synthetic grease (P/N 413 711 500) to both steering column bushings.

SUSPENSION AND SKI SYSTEM

Tundra R



Section 08 STEERING/FRONT SUSPENSION

Subsection 03 (SUSPENSION AND SKI SYSTEM)

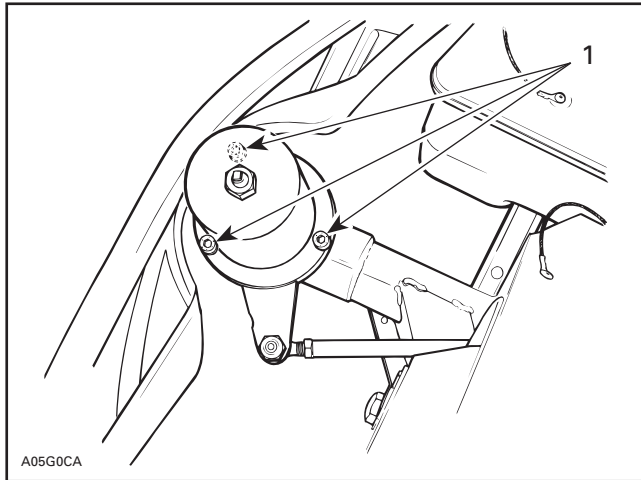
ON-VEHICLE COMPONENT REMOVAL

8, Shock

Lift front of vehicle and support off the ground.

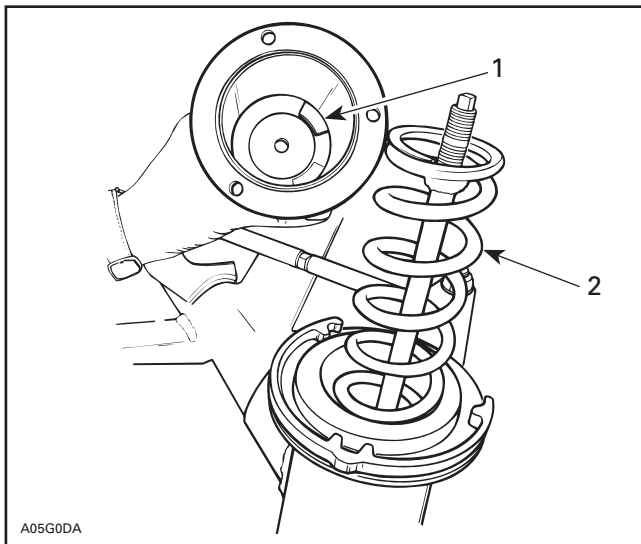
Remove ski.

Unscrew shock rod piston pin nut then remove washer. Unscrew 3 Allen screws retaining cover **no. 3**, then remove stopper **no. 5**, washers **no. 6**, washer **no. 7**.



1. Allen screws

NOTE: These washers and stopper can be wedged in cover.



1. Washers and stopper wedged in cover
2. Spring

Pull out spring then check shock as described below in INSPECTION.

DISASSEMBLY

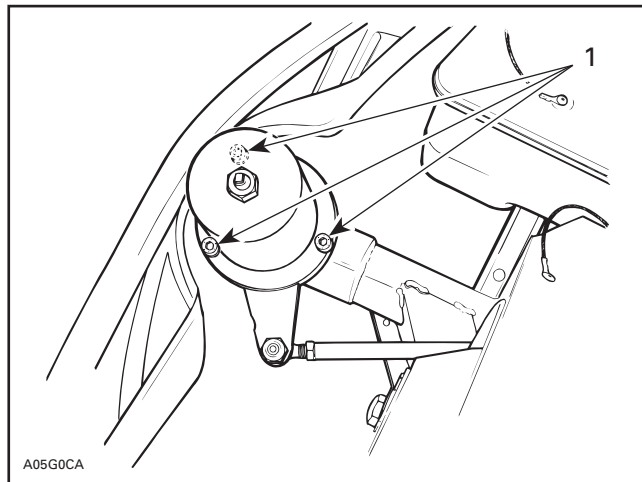
Lift front of vehicle and support off the ground.

1,2,3,5,6,7,9,11,12, Bolt, Lock Washer, Cover, Stopper, Bushing and Nut

Remove ski bolt, nut, bushings and ski.

Unscrew shock rod nut then remove washer. Shock will fall off the ski leg.

Unscrew 3 Allen screws retaining cover, then remove stopper and washers.

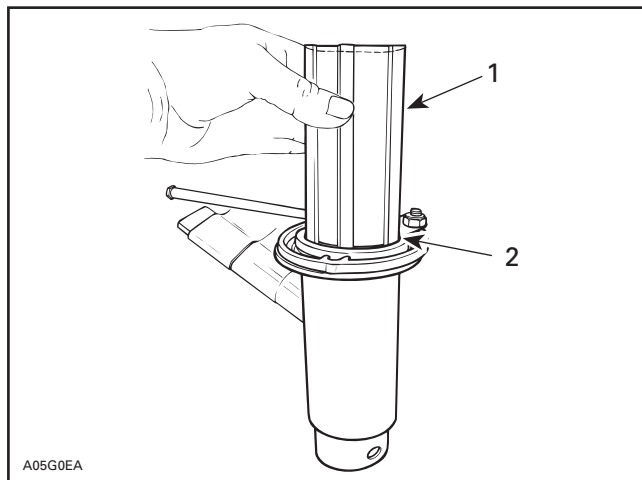


1. Allen screws

NOTE: These washers **nos. 6** and **7** and stopper **no. 5** can be wedged in cover.

4,13,14,16,17, O-Ring, Ski Leg, Bushing and Seal

Pull up ski leg. Steering arm will not interfere.



1. Pull up ski leg
2. Steering arm in place

Section 08 STEERING/FRONT SUSPENSION

Subsection 03 (SUSPENSION AND SKI SYSTEM)

Remove seal and O-rings. Drive out bushing if worn out.

INSPECTION

Suspension Free Operation

Remove cover and check for free movement of ski leg by lifting end of ski.

13, Ski Leg

Check straightness of ski leg. Check for scored or scratched surface. Replace as required. Check that splines on ski leg and steering arm interlock properly without excessive free play. Renew as necessary.

5, Stopper

Check condition of stopper. Replace it when deteriorated.

Grease Fitting

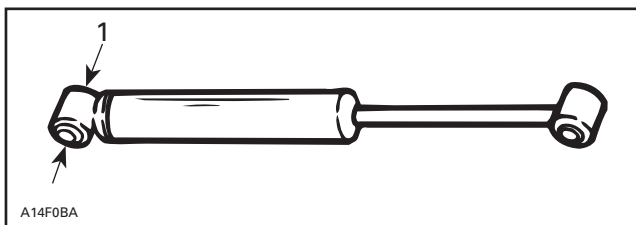
Ensure that grease fittings are not clogged.

10, Stopper

Check stopper for crack or deterioration. Replace as required.

8, Shock Absorber

Secure the shock body end in a vise with its rod upward.



1. Clamp

CAUTION: Do not clamp directly on shock body.

Examine each shock for leaks. Extend and compress the piston several times over its entire stroke checking that it moves smoothly and with uniform resistance.

Pay attention to the following conditions that will denote a defective shock:

- A skip or a hang back when reversing stroke at mid travel.
- Seizing or binding condition except at extreme end of either stroke.
- Oil leakage.
- A gurgling noise, after completing one full compression and extension stroke.

Renew if any faults are present.

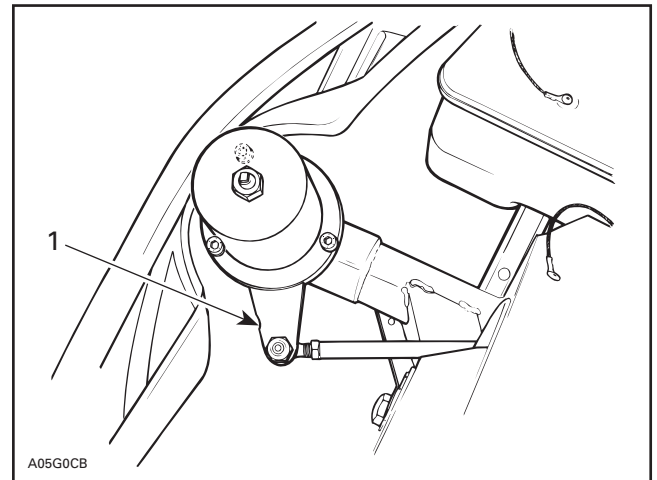
INSTALLATION

For assembly, reverse the disassembly procedure. However, pay attention to the following.

Apply synthetic grease (P/N 413 711 500) as illustrated in exploded view above.

Tighten nuts and screws to proper torque as mentioned in exploded view.

Steering arm notch must face outside of vehicle.



1. Recess facing outside

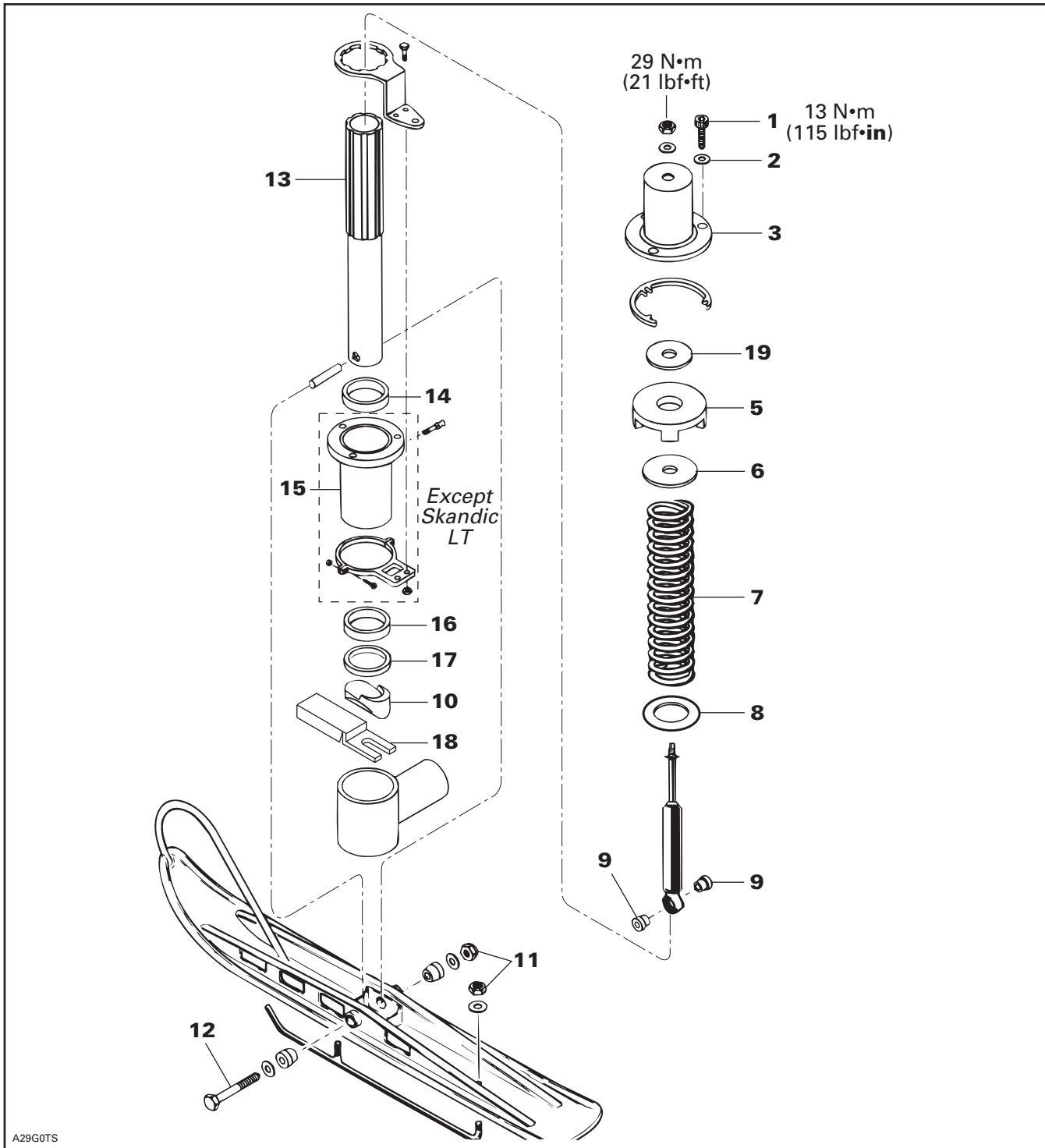
16,17, Seal

Install seal before reinstalling ski leg.

Section 08 STEERING/FRONT SUSPENSION

Subsection 03 (SUSPENSION AND SKI SYSTEM)

Skandic LT/LT E/WT/SWT/WT LC



A29G0TS

TYPICAL

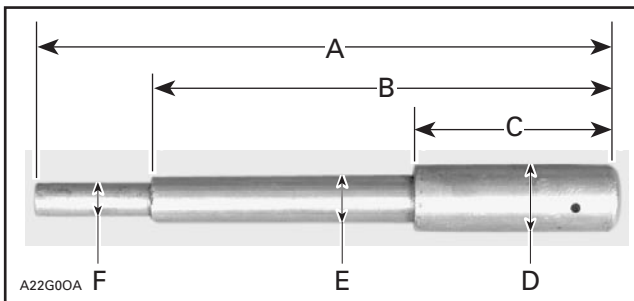
ON-VEHICLE COMPONENT VERIFICATION

8, Shock

Lift front of vehicle and support off the ground.

Remove ski bolt and nut.

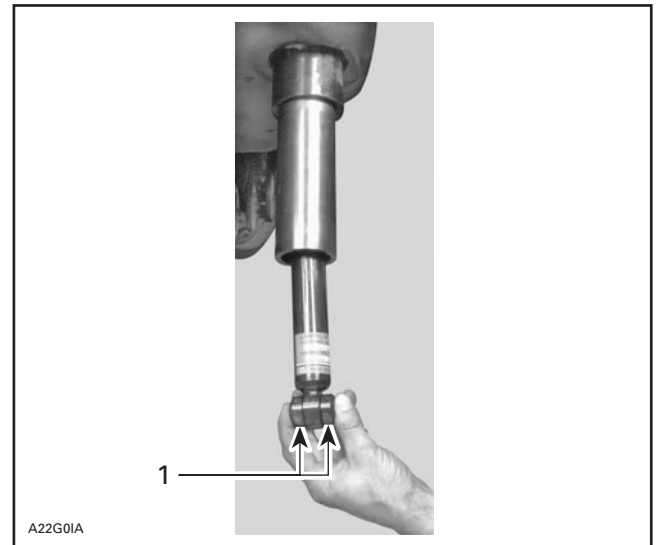
Remove steel bushing from ski using a pusher. See pusher dimensions below.



- A. 220 mm (8.66 in)
- B. 180 mm (7.09 in)
- C. 70 mm (2.75 in)
- D. 25 mm (1.0 in)
- E. 15 mm (0.59 in)
- F. 9 mm (0.35 in)



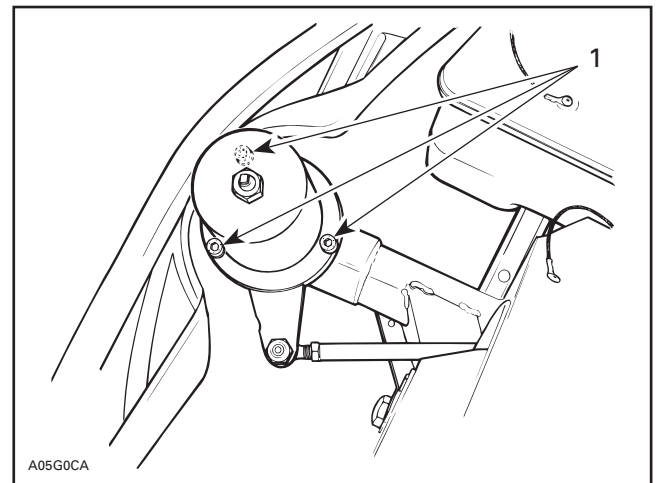
Unfasten rod nut then pull out shock from bottom. Check shock as described below in INSPECTION. At installation, make sure bushings are in place.



1. Bushings

7, Spring

Unscrew shock rod nut then remove washer. Unscrew 3 Allen screws retaining cover no. 3, then remove stopper no. 5, washers no. 6, washer no. 19.

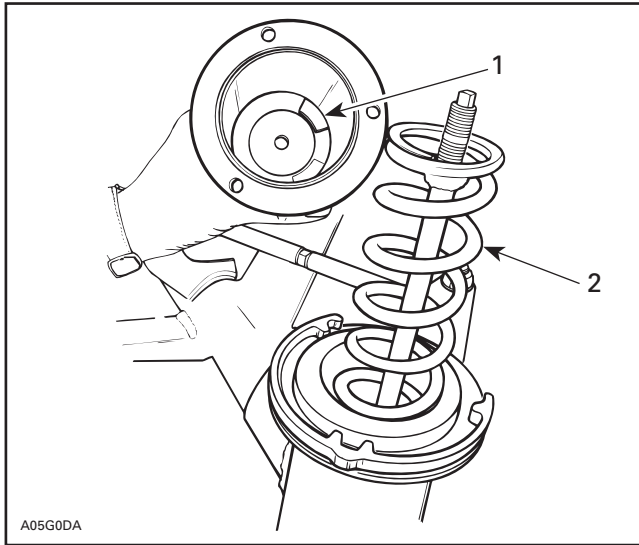


1. Allen screws

NOTE: These washers and stopper can be wedged in cover.

Section 08 STEERING/FRONT SUSPENSION

Subsection 03 (SUSPENSION AND SKI SYSTEM)



1. Washers and stopper wedged in cover
2. Spring

Pull out spring.

DISASSEMBLY

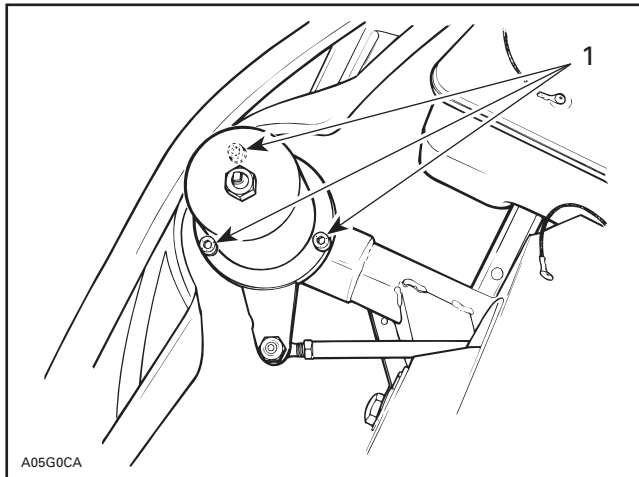
Lift front of vehicle and support off the ground.

1,2,3,5,6,9,11,12, Bolt, Lock Washer, Cover, Stopper, Bushing and Nut

Remove ski bolt, nut, bushings and ski.

Unscrew shock rod nut then remove washer. Shock will fall off the ski leg.

Unscrew 3 Allen screws retaining cover, then remove stopper and washers.

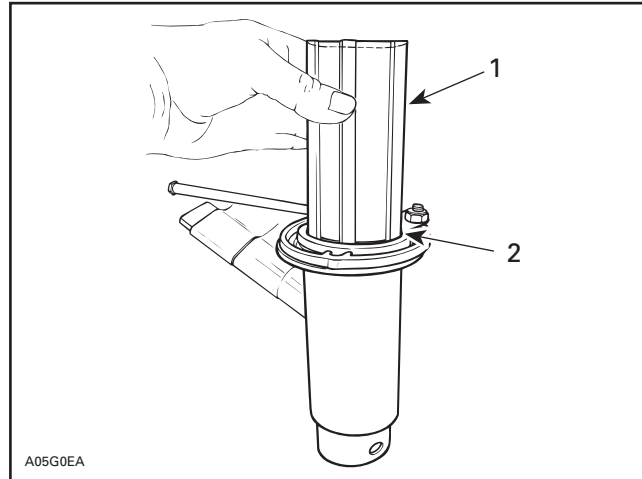


1. Allen screws

NOTE: These washers and stopper can be wedged in cap.

13,14,16,17, Ski Leg, Bushing and Seal

Pull up ski leg. Steering arm will not interfere.



1. Pull up ski leg
2. Steering arm in place

Remove seal. Drive out bushing if worn out.

INSPECTION

All Models

Suspension Free Operation

Remove cover and check for free movement of ski leg by lifting end of ski.

13, Ski Leg

Check straightness of ski leg. Check for scored or scratched surface. Replace as required.

Check that splines on ski leg and steering arm interlock properly with no excessive free play. Renew as necessary.

5, Stopper

Check condition of stopper. Replace it when deteriorated.

Grease Fitting

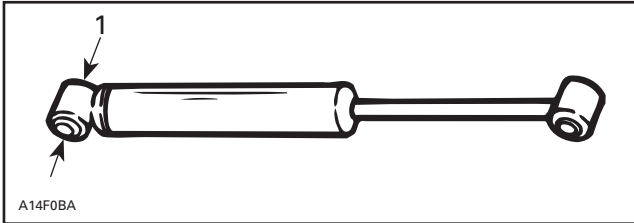
Ensure that grease fittings are not clogged.

10, Ski Stopper

Check stopper for crack or deterioration. Replace as required.

8, Shock Absorber

Secure the shock body end in a vise with its rod upward.



1. Clamp

CAUTION: Do not clamp directly on shock body.

Examine each shock for leaks. Extend and compress the piston several times over its entire stroke checking that it moves smoothly and with uniform resistance.

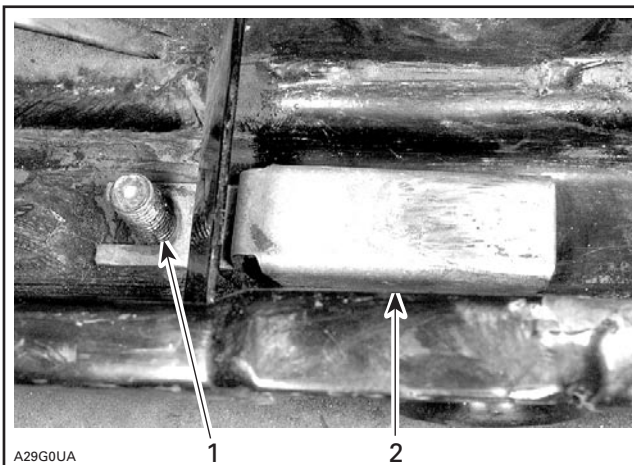
Pay attention to the following conditions that will denote a defective shock:

- A skip or a hang back when reversing stroke at mid travel.
- Seizing or binding condition except at extreme end of either stroke.
- Oil leakage.
- A gurgling noise, after completing one full compression and extension stroke.

Renew if any faults are present.

18, Support Plate

Position support plate against runner stud.



1. Runner stud
2. Support plate

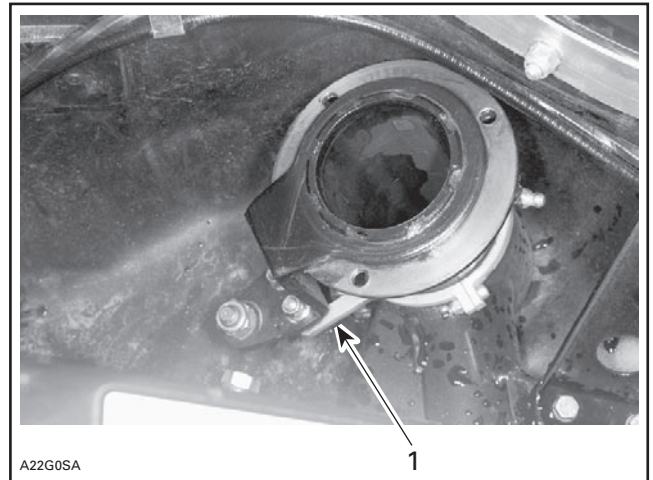
INSTALLATION

For assembly, reverse the disassembly procedure. However, pay attention to the following.

Apply synthetic grease (P/N 413 711 500) as illustrated in exploded view above.

Tighten nuts and screws to proper torque as mentioned in exploded view.

Reinstall steering arm reinforcement when removed.



1. Reinforcement

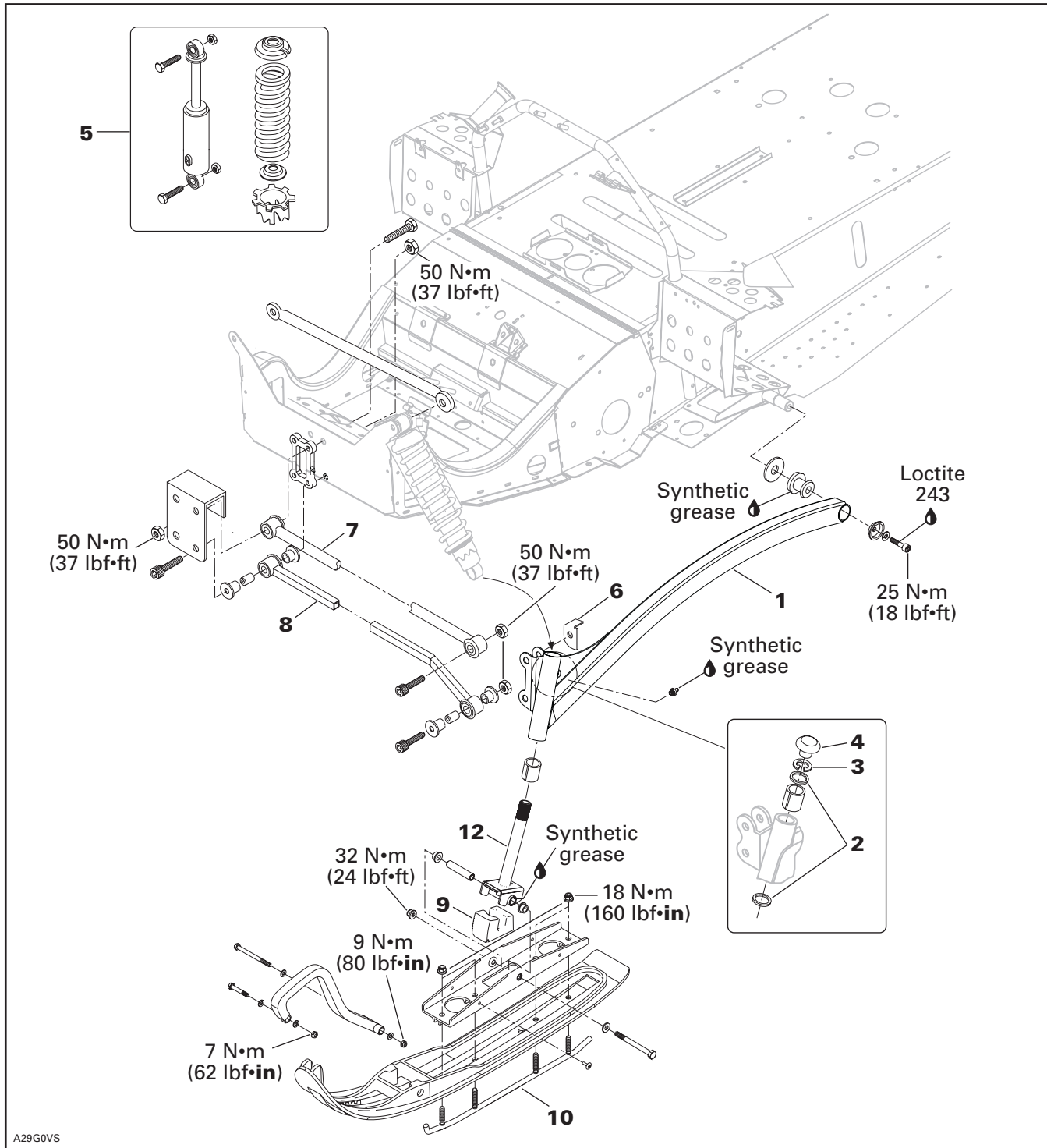
16,17, Seal

Install seal before reinstalling ski leg.

Section 08 STEERING/FRONT SUSPENSION

Subsection 03 (SUSPENSION AND SKI SYSTEM)

Skandic SUV



TYPICAL

DISASSEMBLY

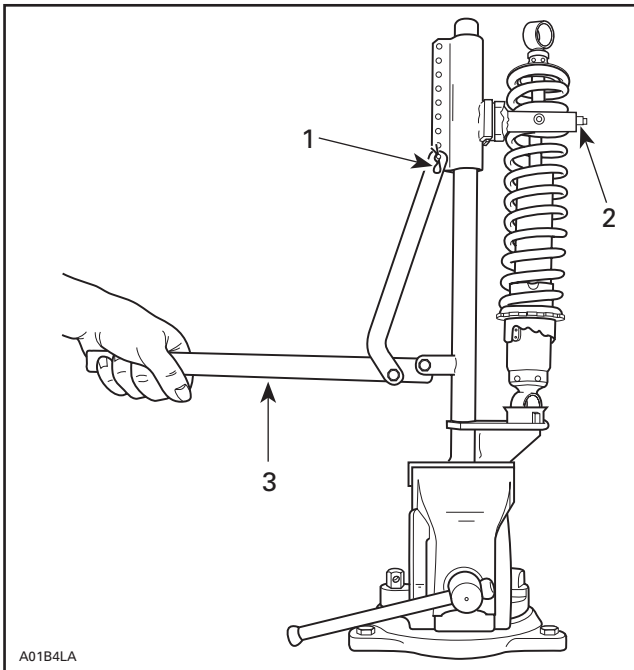
5, Shock

Lift front of vehicle and support it off the ground. Reduce spring preload by turning adjusting ring accordingly.

Remove lower bolt then upper bolt of shock.

For shock spring disassembly use shock spring remover (P/N 529 035 504) in a vise. Mount shock in it and turn shock so that spring coils matched spring compressor.

Close and lock the bar. Adjust the handle at horizontal position by changing the position of the clevis pin.



1. Clevis pin
2. Bar
3. Handle horizontal

Push down on the handle until it locks. Remove spring stopper then release handle.

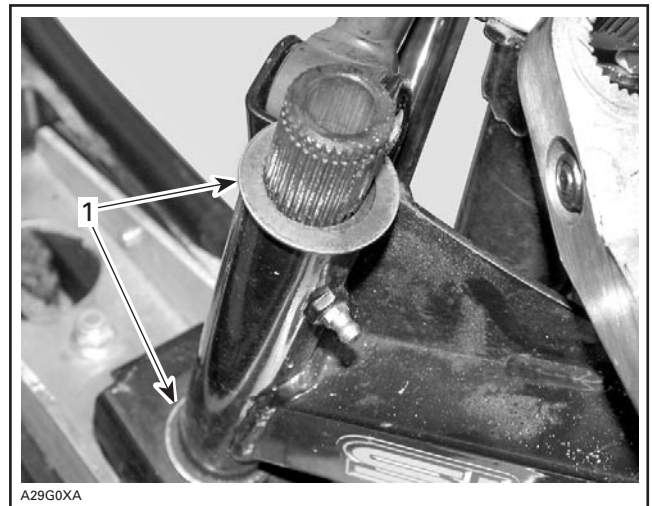
1, Swing Arm

Lift front of vehicle and support it off the ground. Remove cap no. 4, circlip no. 3.

Scribe mark the steering arm and ski leg before disassembly.



Then loosen steering arm bolt and pull up steering arm. Ski leg may fall off from swing arm. Note shim no. 2 position.



1. Shims no. 2

Unbolt lower end of shock from swing arm. Unbolt upper and lower arms. Unbolt rear of swing arm from frame. Pull swing arm off the vehicle.

Section 08 STEERING/FRONT SUSPENSION

Subsection 03 (SUSPENSION AND SKI SYSTEM)

INSPECTION

Check all rubber cushions for crack and wear. Replace as required.

Check straightness of ski leg **no. 12** and make sure that splines are properly interlocking with steering arm. Replace as required.

Check for straightness of swing arm. Replace as required.

Check for clogged grease fittings. Clean or replace as required.

Check skis and runners **no. 10** for wear, replace as necessary.

Check condition of ski stopper **no. 9**. Replace it when deteriorated.

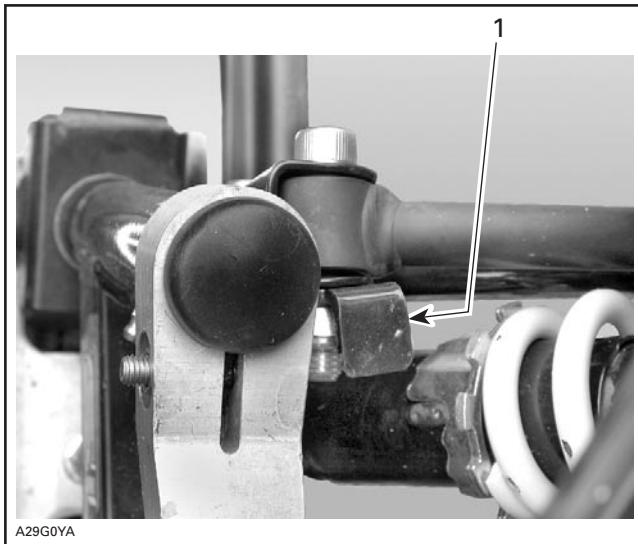
To check condition of shock, refer to SHOCK ABSORBER in INSPECTION CHAPTER.

INSTALLATION

For assembly, reverse the disassembly procedure. However, pay attention to the following.

Apply synthetic grease (P/N 413 711 500) to ski leg components.

Install steering stopper **no. 6** as per following photo.



TYPICAL

1. *Steering stopper*

Longer bolts for shock and swing arm go on upper attachments.

Tighten nuts and screws to proper torque as mentioned in exploded view.

7,8, Upper and Lower Arms

Position arms and tie rods horizontally before tightening nuts.

Bent portion of lower arm **no. 6** must face down.

Steering arm must be installed parallel to ski.



1. *Parallel*