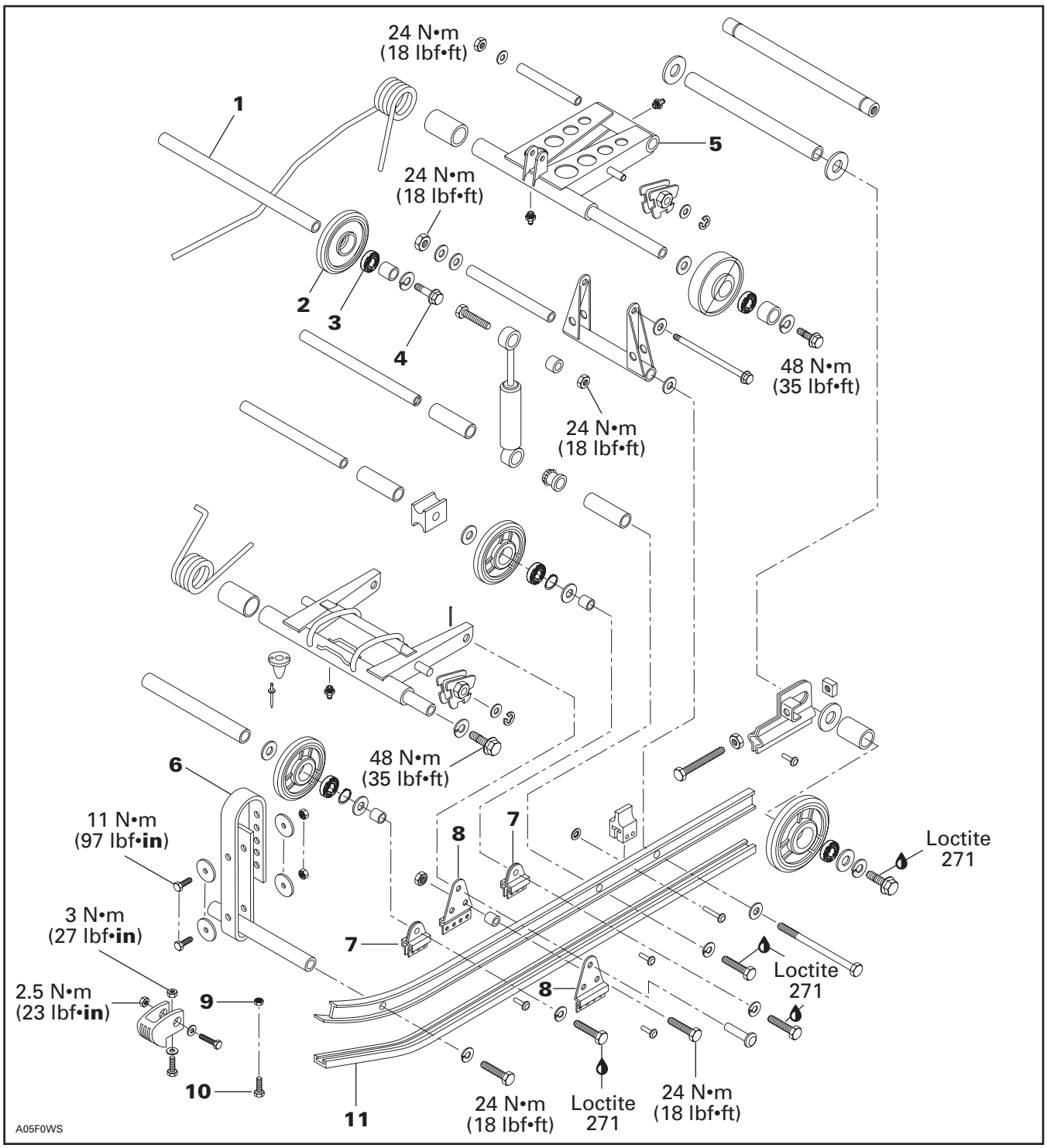
TABLE OF CONTENTS

TORQUE REACTION SUSPENSION

Tundra/R



PARTS

COMPONENT REMOVAL

Lift rear of vehicle and support it off the ground.

5, Rear Arm

Release spring tension. Unfasten shock from rear arm. Remove 3 screws retaining rear arm.

REMOVAL

NOTE: To prevent cross shaft from turning when unscrewing screws assembled with threadlocker, proceed as follows:

– Loosen one screw then retighten.
– Remove the other screw.
– Remove the first one.

1,2,3,4, Cross Shaft, Idler Wheel, Spacer and Screw

Remove idler wheel ass'y.

Lift rear of vehicle and support it off the ground.

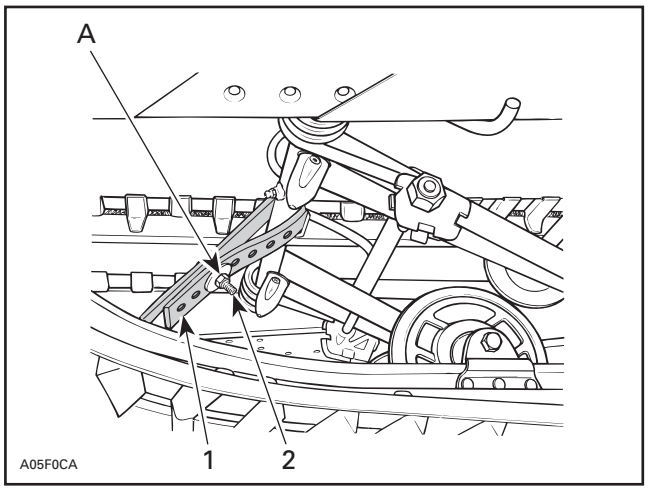
Unscrew 4 screws retaining front arm and rear arm to frame.

Remove suspension.

DISASSEMBLY AND ASSEMBLY

6, Stopper Strap

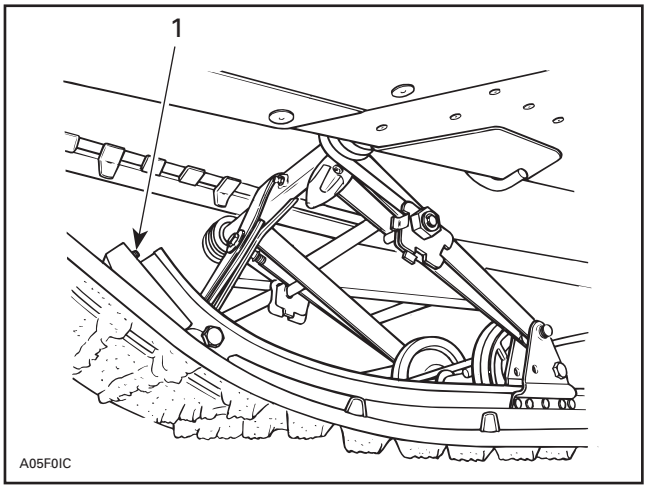
Inspect strap for wear or cracks, bolt and nut for tightness. If loose, inspect hole for deformation. Replace as required. Make sure it is attached through the 3rd hole from the end. Torque nut to 11 N•m (97 lbf•**in**).



1. 1st hole
2. 3rd hole
*A. 11 N•m (97 lbf•**in**)*

9,10,12, Nut, Slotted Screw and Slider Shoe

To replace a worn shoe, remove the front screw and stop nut, then slide the shoe rearward out of the runner.



1. Front screw and nut

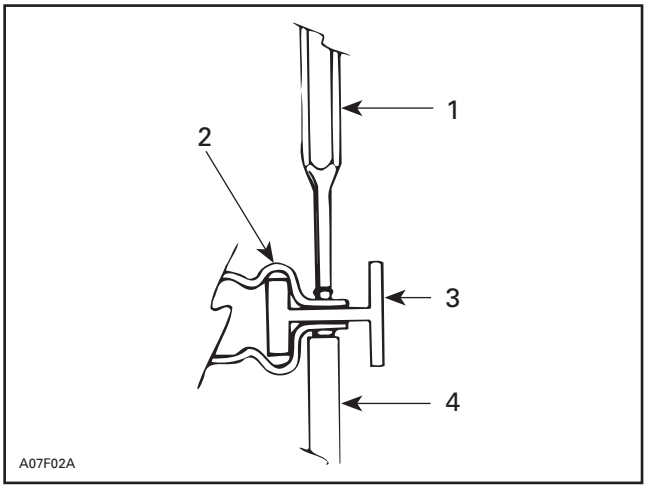
▼ CAUTION

Slider shoes must always be replaced in pairs.

7,8, Support and Front Arm Support

To remove rivets securing the supports, cut rivet heads off using a cold chisel.

At assembly, position the rivet head toward the outside of the assembly. Support the rivet head against a metal block, as shown, and use a flat head punch to secure the rivet in place.



1. Flat head punch
2. Support
3. Runner
4. Metal block

NOTE: Rivets can be substituted with 3/16 in x 3/4 in long screws and flanged elastic stop nuts. Always position screw head outside the assembly.

INSPECTION

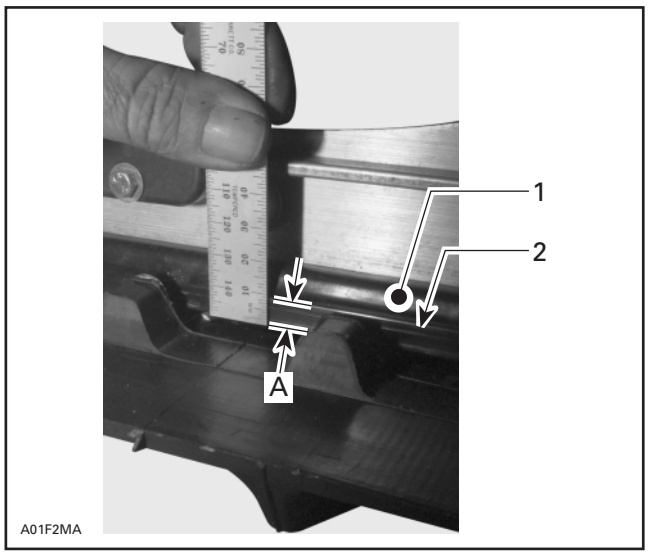
Shock Absorber

Refer to SUSPENSION AND SKI SYSTEM 08-03 for shock inspection.

11, Slider Shoe

Measure slider shoes from the bottom to the 0.5 mm (.020 in) radius as shown on the next photo.

Minimum thickness must be 2 mm (.080 in).



TYPICAL

1. *Slider shoe*
2. *Molding line (this line is not the wear limit)*

A. Wear measurement (must be at least 2 mm (.080 in))

Replace slider shoes when wear limit is reached.

▼ CAUTION

Slider shoes must always be replaced in pairs.

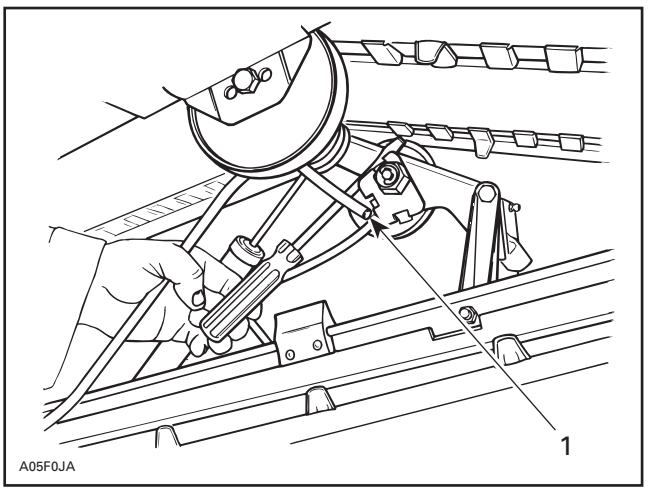
INSTALLATION

Release rear spring tension then install assembled suspension into track with front portion first.

Insert rear portion of suspension into track.

Bolt suspension to tunnel.

Pry rear spring end onto cam.



1. Spring end

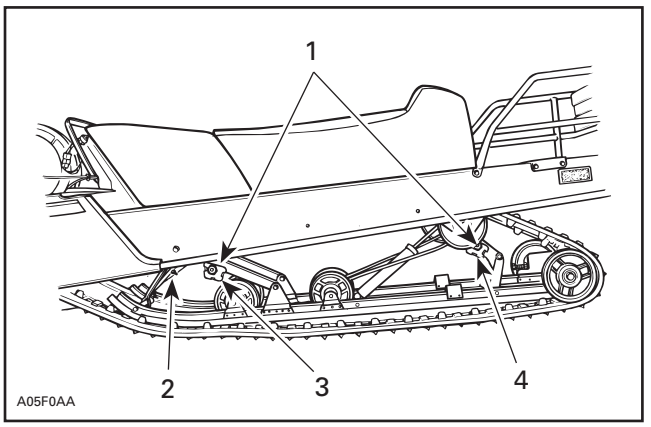
Adjust track tension/alignment. Refer to TRACK 07-05.

RIDE ADJUSTMENT

The front portion of rear suspension is adjustable for surface condition and steering effects.

The stopper strap is adjustable for vehicle weight transfer control.

The rear portion of rear suspension is adjustable for driver's weight.



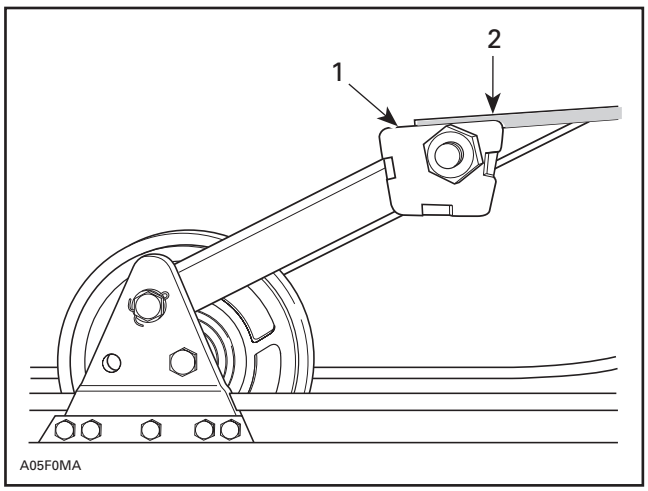
1. *Driver's weight*
2. *Stopper strap for weight transfer*
3. *Steering effect/surface condition*
4. *Adjustment cams*

Choice of suspension adjustments depends on carrying load, driver's weight, personal preference, riding speed and field condition.

Slight suspension bottoming occurring under the worst riding conditions indicates a good choice of spring preload.

To adjust rear suspension adjustment cams, use special key supplied in vehicle tool box.

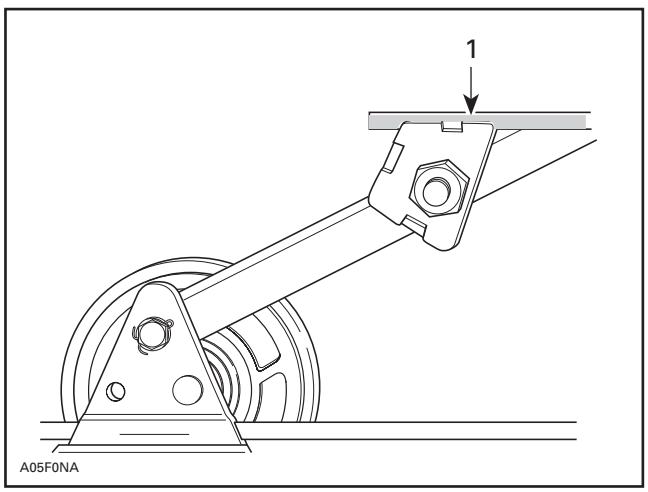
Turning adjustment cam moves edges of cam supporting spring rod. The softest adjustment is reached when the supporting edge of cam is the closest to hexagonal portion of cam.



SOFTEST ADJUSTMENT

1. *Supporting edge closest to hexagonal*
2. *Spring*

The stiffest adjustment is reached when the supporting edge of cam is the farthest to hexagonal portion of cam.

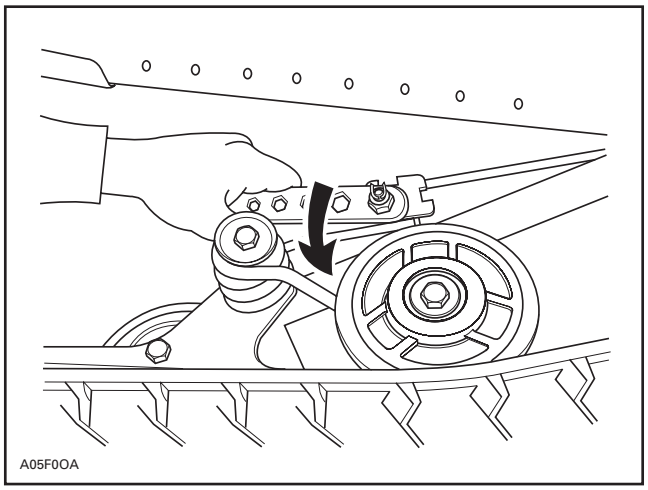


STIFFEST ADJUSTMENT

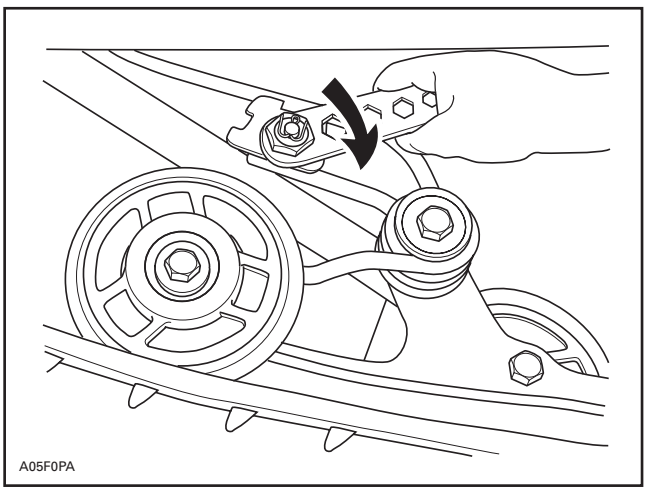
1. *Supporting edge farthest to hexagonal*

▼ CAUTION

Always turn the left side adjustment cams in a clockwise direction and the right side cams in a counterclockwise direction. Left and right adjustment cams must always be set at the same position.



RH SIDE

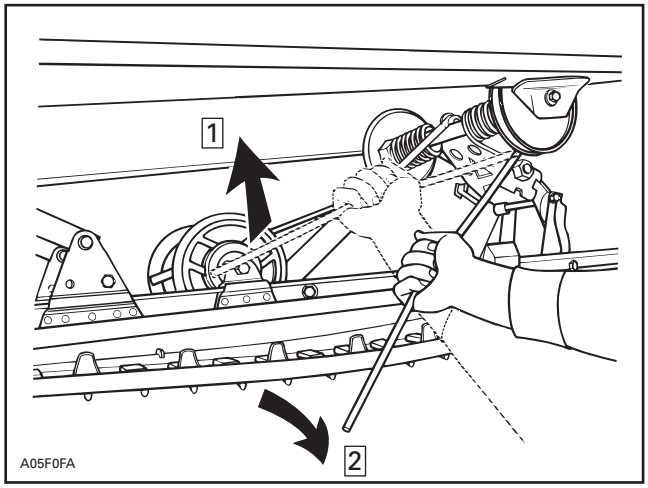


LH SIDE

NOTE: To quickly change rear cam position without using any tool:

– Lay vehicle on its side.

– Unhook rear spring by hand from lower idler wheel.



– Turn adjustment cam by hand to the desired position.
– Reinstall spring on its support making sure that it sits in the groove of support.

Stopper Strap

The function of the stopper strap is to control the transfer of vehicle weight during acceleration and to control track lead angle.

The longer the belt, the more the weight will be transferred to the track to provide a better traction. The shorter the belt, the lesser the weight transferred to the track, thus maintaining a more positive steering.

The longer the belt, the greater will be the track lead angle. A shorter belt will reduce track lead angle which may help when negotiating a particular snow condition.

Adjusting holes on the stopper strap allow to adjust it according to driver's requirements, field and/or snow conditions.

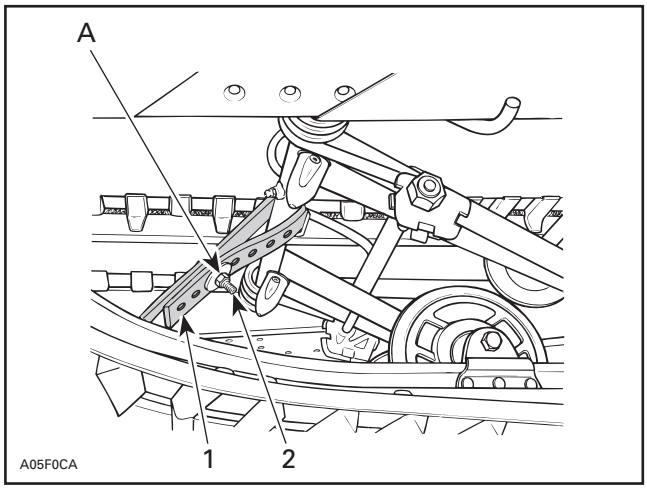
▼ CAUTION

Whenever stopper strap length is changed, track tension must be readjusted to prevent any possibility of operating vehicle with a too loose or too tight track tension.

For normal use, locate bolt through 3rd hole from strap end.

◆ WARNING

Always torque the nut to 11 N•m (97 lbf•**in**). Replace strap if worn or torn.



1. 1st hole
2. 3rd hole
*A. 11 N•m (97 lbf•**in**)*

NOTE: When towing a load, it is suggested to adjust stopper strap to its shortest length, soften front springs of rear suspension and stiffen rear springs. These adjustment will improve steering ability.

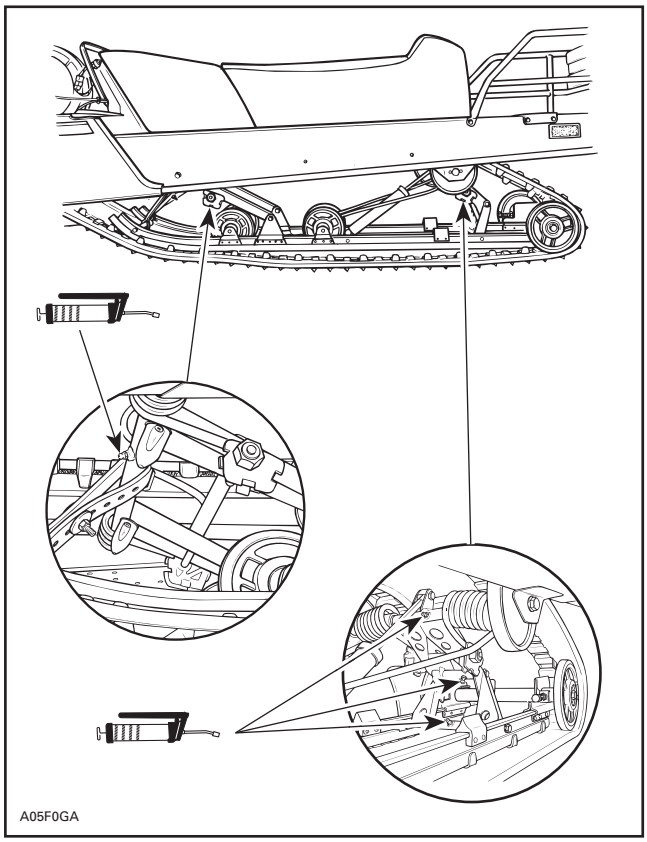
Deep Snow Operation

When operating the vehicle in deep snow, it may be necessary to change position of adjustment cams, stopper strap and/or driver's riding position, to change the angle at which the track rides on the snow. Operator's familiarly with the various adjustments as well as snow conditions will dictate the most efficient combination.

LUBRICATION

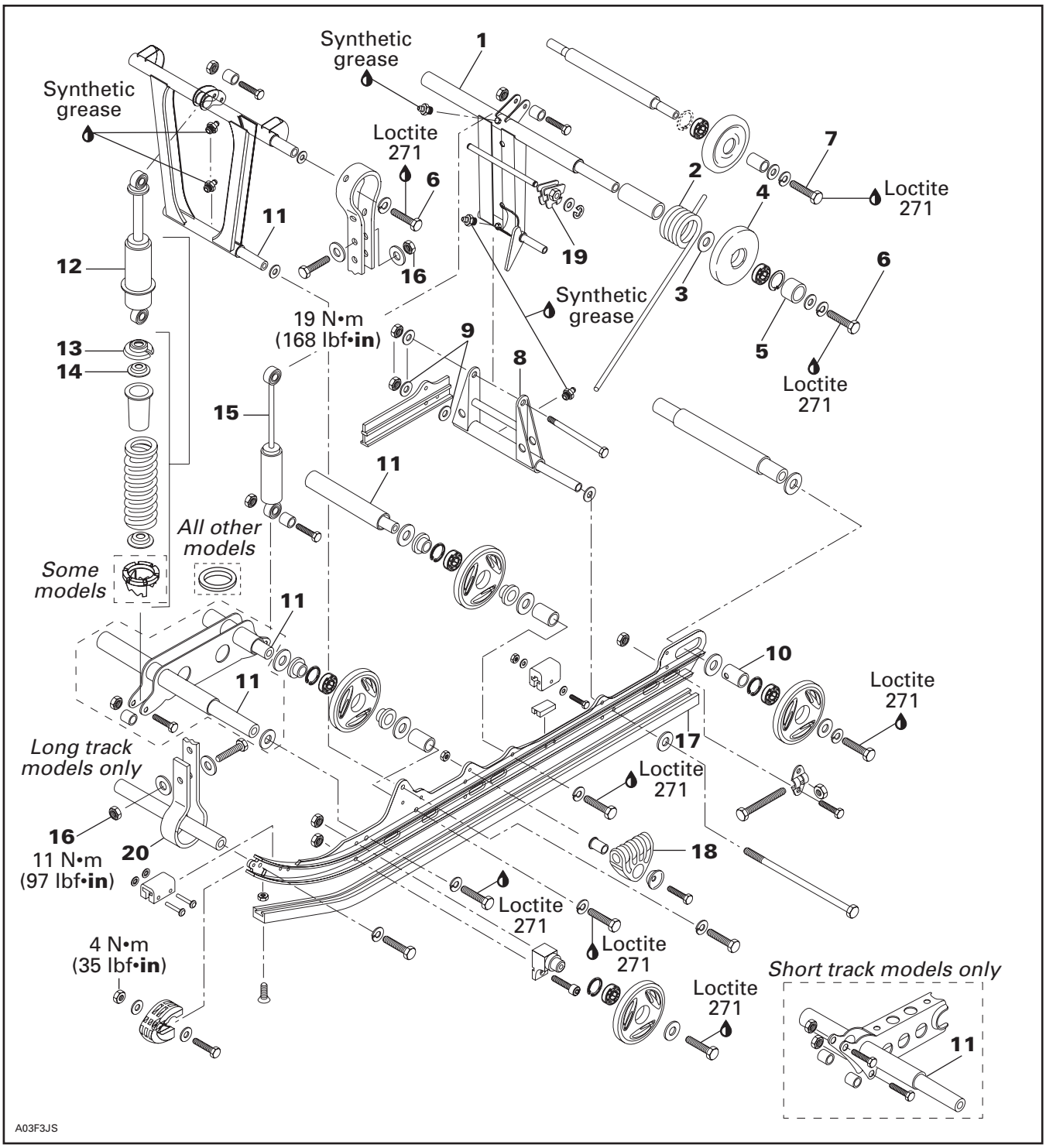
Lubricate front and rear arms at grease fittings using synthetic grease (P/N 413 711 500).

NOTE: There are 4 grease fittings.



SC-10 SPORT AND TOURING SUSPENSIONS

S-Series



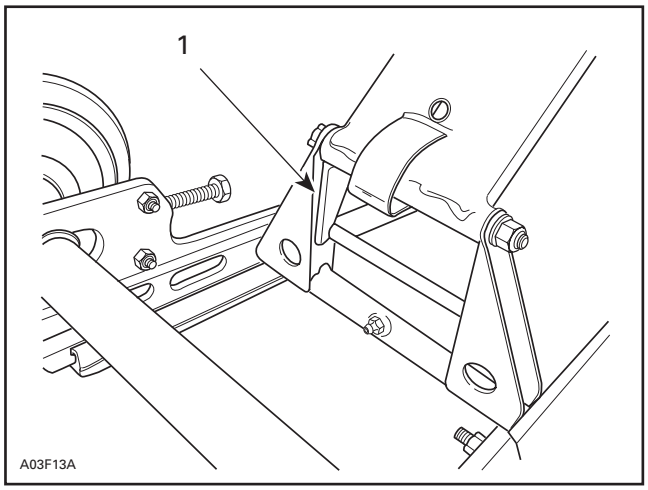
COMPONENT REMOVAL AND INSTALLATION

Lift rear of vehicle and support it off the ground.

1, Rear Arm

Release spring tension by unfastening spring support. Unfasten shock from rear arm. Remove 3 screws retaining rear arm.

At installation, rear arm stroke limiter must be behind shackle.

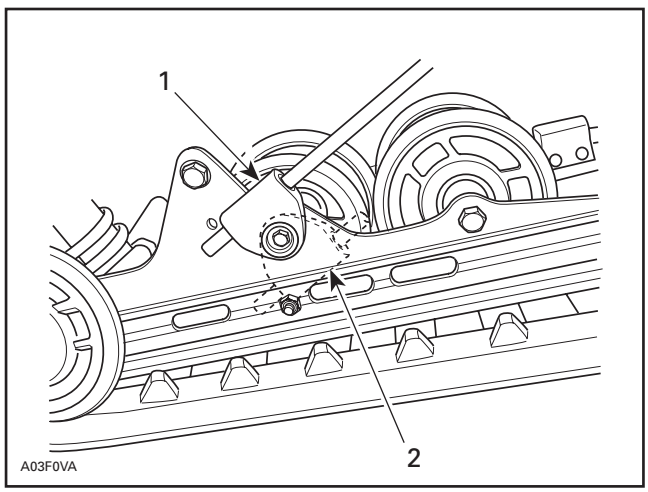


1. Stroke limiter on rear side

18, Spring Support

▼ CAUTION

To avoid track damage, spring supports must be mounted upward.



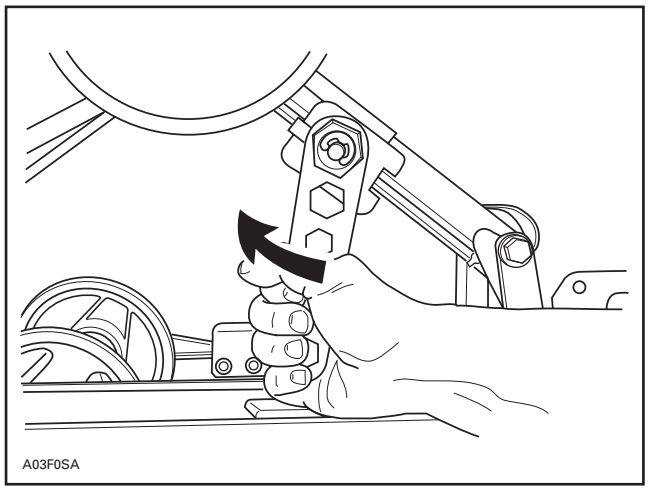
RIGHT SIDE SHOWN

1. Right position: upward
2. Wrong position

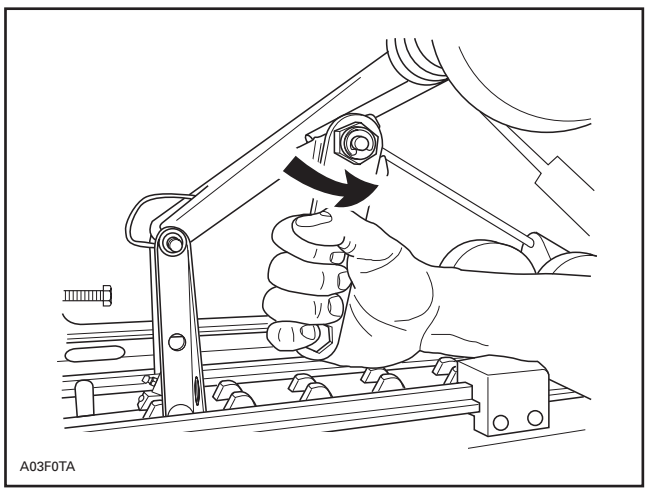
REMOVAL

19, Cam

Decrease spring preload by turning LH cam clockwise and RH cam counterclockwise.



LH SIDE SHOWN



RH SIDE SHOWN

Lift rear of vehicle and support it off the ground. Block suspension in place.

2,3,4,5,6,18, Spring, Washer, Idler Wheel, Spacer, Screw and Spring Support

Unbolt spring support from runner while retaining spring end. Move spring end rearward to completely release spring preload. Proceed with the other side.

Unscrew both rear arm screws.

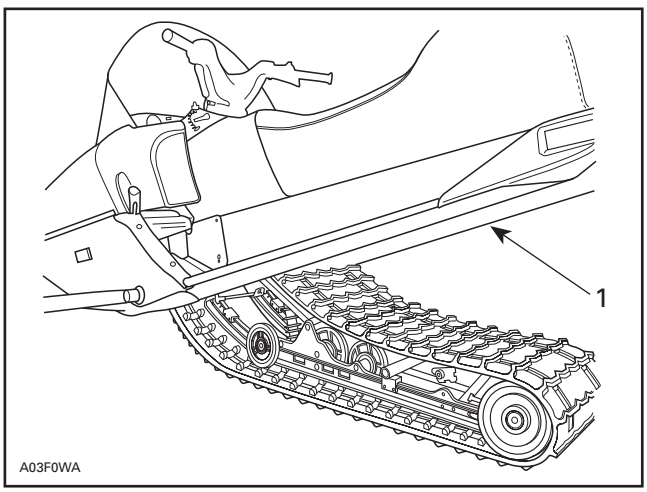
NOTE: To prevent cross shaft from turning when unscrewing screws assembled with threadlocker, proceed as follows:

– Knock on screw head and/or heat to break threadlocker bond.
– Loosen 1 screw then retighten.
– Remove the opposite screw.
– Remove the first one.

7, Screw

Unscrew center idler wheel axle from tunnel then remove.

Lift rear of vehicle until spacers, idler wheels, washers and springs can be removed.



1. Lift rear of vehicle

6, Screw

Remove both screws retaining front arm to tunnel.

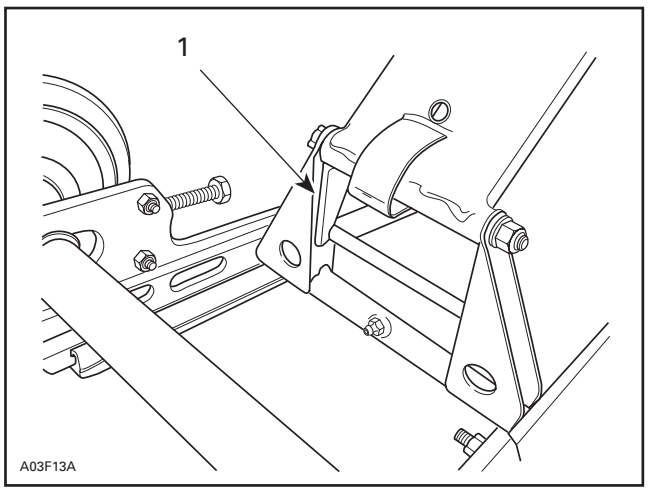
Remove suspension.

DISASSEMBLY AND ASSEMBLY

Inspect track thoroughly before reinstalling suspension. Refer to 07-05 TRACK.

1, Rear Arm

At installation, rear arm stroke limiter must be on rear side.



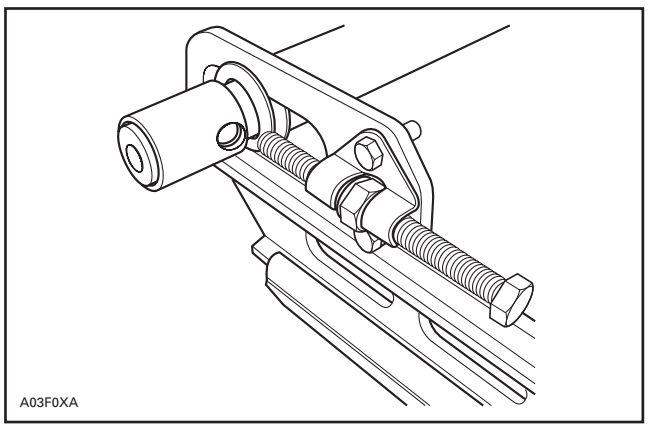
1. Stroke limiter on rear side

8,9, Pivot Arm and Flat Washer

At installation pivot arm grease fitting must face rearward. Small washer must be against nut. Large washers must be inside rails on both sides.

10, Outer Bushing

At installation, hole must face adjustment screw.



11, Axle

Note position of axles at disassembly. Axles with a paint stripe serve as idler wheel axles. These are more precise than those used as pivot axles. Idler wheel axles can be used as pivot axles but the opposite is not true.

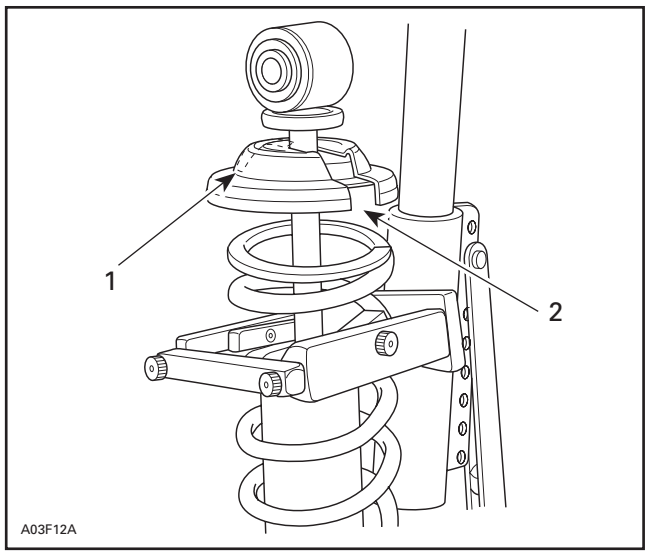
12,13,14, Front Shock, Spring Stopper and Cap

Use shock spring remover (P/N 529 027 100) in a vise. Mount shock in it and turn shock so that spring coils matched spring compressor.

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

Push down on handle until il locks. Remove spring stopper and cap then release handle.

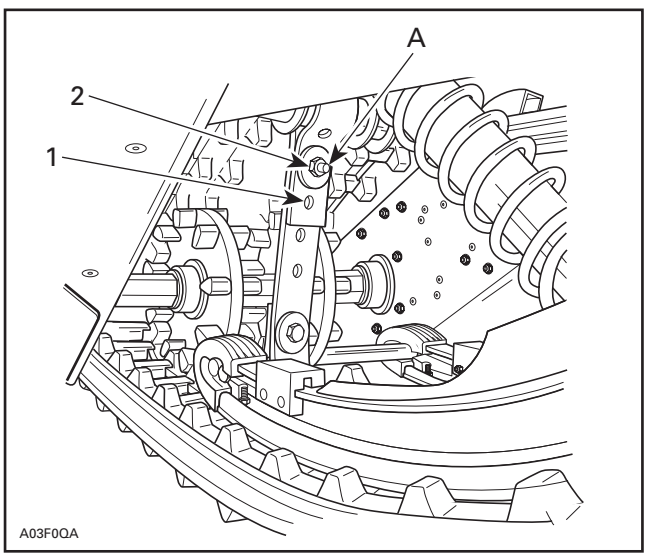
At installation, cap opening must be 180° from spring stopper opening.



1. Spring stopper opening
2. Cap opening

20, Stopper Strap

Inspect strap for wear or cracks, bolt and nut for tightness. If loose, inspect hole for deformation. Replace as required. Make sure it is attached through the 2nd hole from the end. Torque nut to 11 N•m (97 lbf•**in**).



1. 1st hole
2. 2nd hole
*A. 11 N•m (97 lbf•**in**)*

INSPECTION

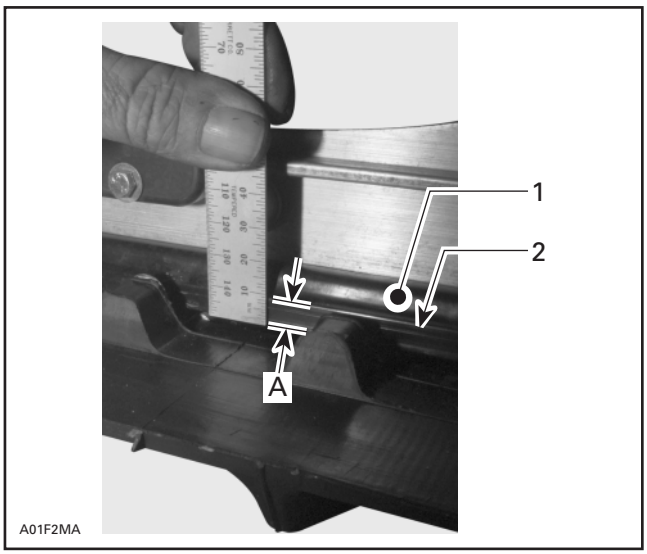
Shock Absorber

Refer to SUSPENSION AND SKI SYSTEM 08-03 then look for **Shock Inspection**.

17, Slider Shoe

Measure slider shoes from the bottom to the 0.5 mm (.020 in) radius as shown on the next photo.

Minimum thickness must be 2 mm (.080 in).



TYPICAL

1. Slider shoe
2. Molding line (this line is not the wear limit)
A. Wear limit measurement (must be at least 2 mm (.080 in))

Replace slider shoes when wear limit is reached.

▼ CAUTION

Slider shoes must always be replaced in pairs.

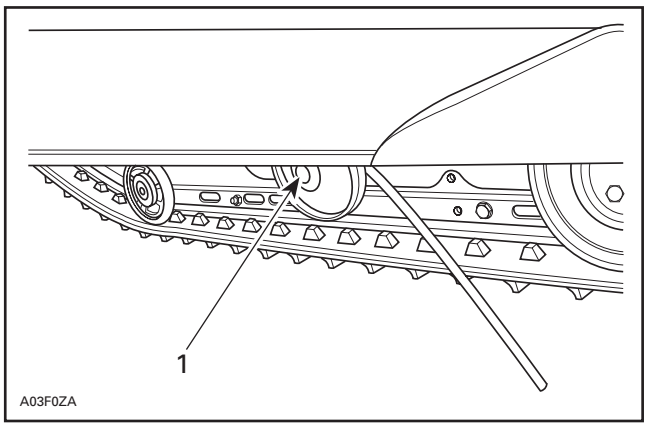
INSTALLATION

Do not install rear spring yet. Install assembled suspension into track with front portion first.

Insert rear portion of suspension into track.

2,3,4,5,6, Spring, Washer, Idler Wheel, Spacer and Screw

On each side, install rear spring, washer, idler wheel, spacer then bolt that axle to tunnel.



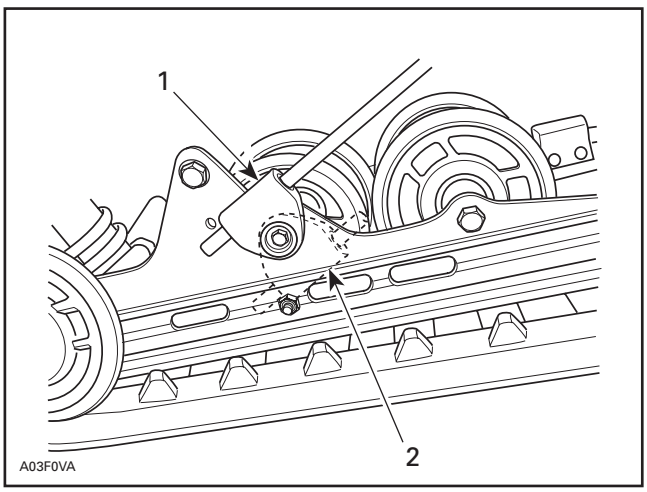
1. Spacer

18, Spring Support

Install spring supports to rails.

▼ CAUTION

To avoid track damage, spring supports must be mounted upward.



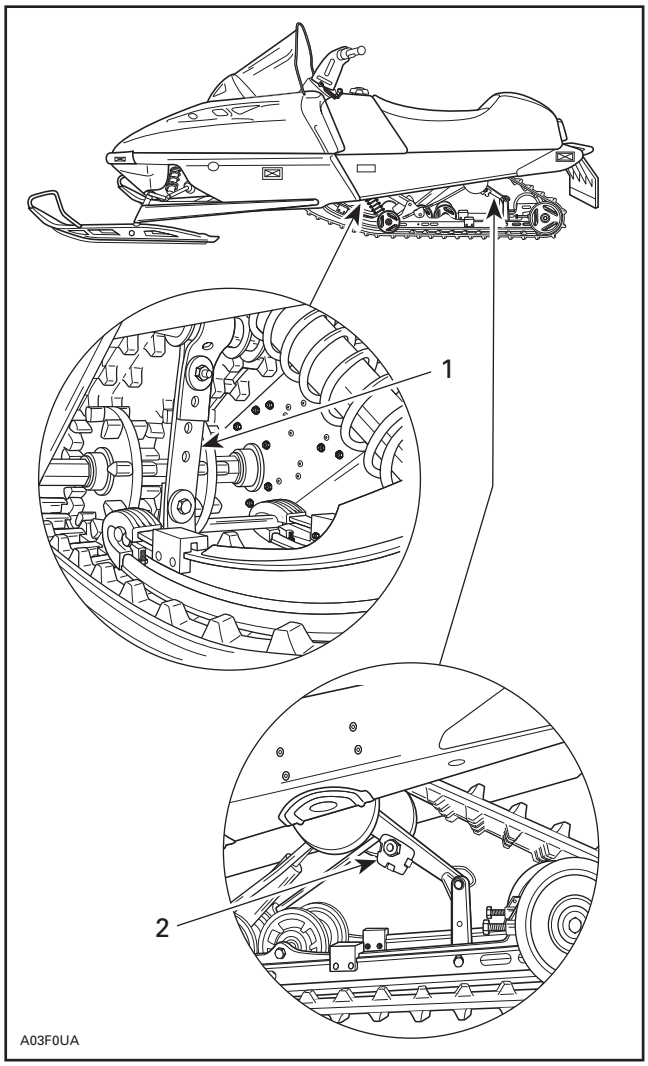
RIGHT SIDE SHOWN

1. Right position: upward
2. Wrong position

RIDE ADJUSTMENT

The stopper strap is adjustable for vehicle weight transfer control.

The rear portion of rear suspension is adjustable for driver's weight.



1. Stopper strap for weight transfer
2. Driver's weight

Choice of suspension adjustments depends on carrying load, driver's weight, personal preference, riding speed and field condition.

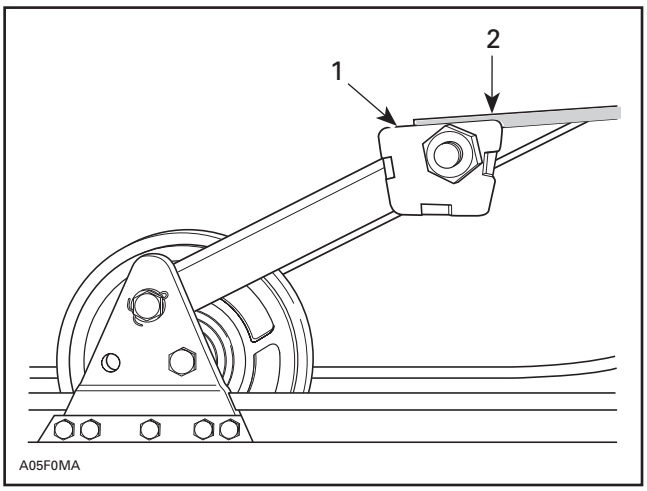
Rear Suspension Setting Table

Cam Position	Soft → Heavy
Operator's Weight	Light → High
Riding Speed	Low → High
Field Condition	Flat → Bumpy

Slight suspension bottoming occurring under the worst riding conditions indicates a good choice of springs preload.

To adjust rear suspension adjustment cams, use multi wrench supplied in vehicle tool box.

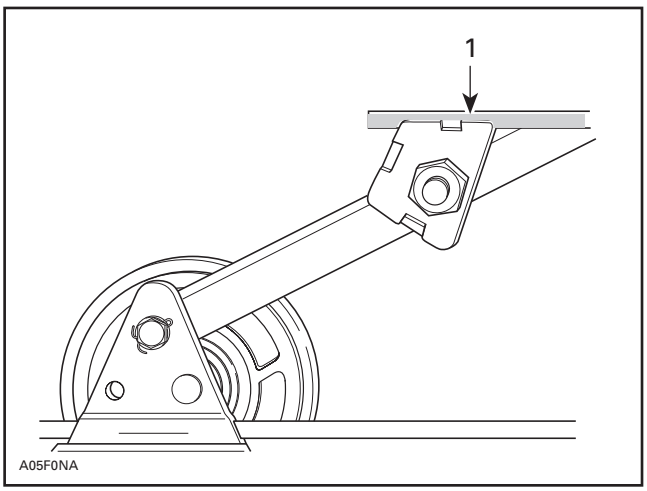
Turning adjustment cam moves edges of cam supporting spring rod. The softest adjustment is reached when the supporting edge of cam is the closest to hexagonal portion of cam.



SOFTEST ADJUSTMENT

1. *Supporting edge **closest** to hexagonal*
2. *Spring*

The stiffest adjustment is reached when the supporting edge of cam is the farthest to hexagonal portion of cam.

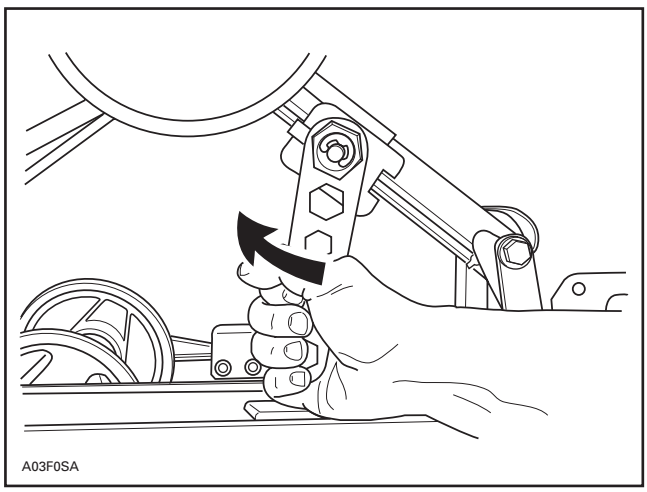


STIFFEST ADJUSTMENT

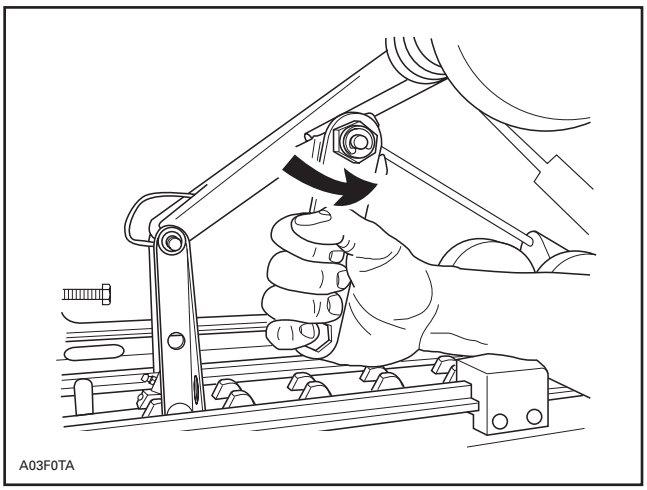
1. *Supporting edge **farthest** to hexagonal*

▼ CAUTION

Always turn the left side adjustment cams in a clockwise direction and the right side cams in a counterclockwise direction. Left and right adjustment cams must always be set at the same position.



LH SIDE SHOWN



RH SIDE SHOWN

Stopper Strap

The function of the stopper strap is to control the transfer of vehicle weight during acceleration and to control track lead angle.

The longer the belt, the more the weight will be transferred to the track to provide a better traction. The shorter the belt, the lesser the weight transferred to the track, thus maintaining a more positive steering.

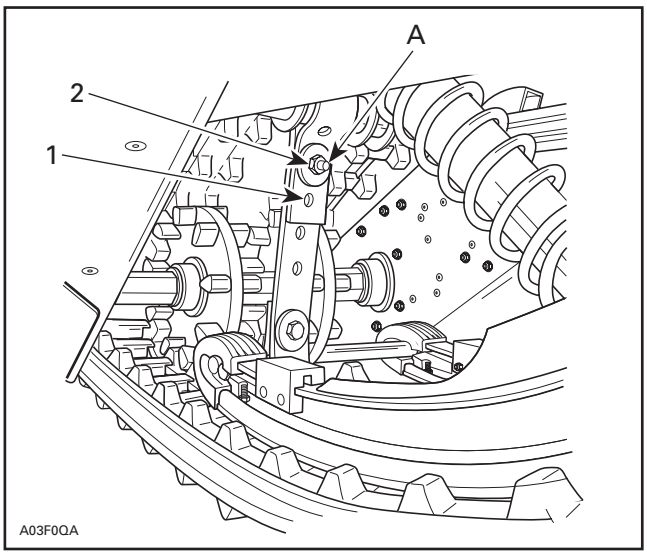
The longer the belt, the greater will be the track lead angle. A shorter belt will reduce track lead angle which may help when negotiating a particular snow condition.

Adjusting holes on the stopper strap allow to adjust it according to driver's requirements, field and/or snow conditions.

▼ CAUTION

Whenever stopper strap length is changed, track tension must be readjusted to prevent any possibility of operating vehicle with a too loose or too tight track tension.

For normal use, locate bolt through 2nd hole from strap end.



1. 1st hole
2. 2nd hole
*A. 11 N•m (97 lbf•**in**)*

◆ WARNING

Always torque the nut to 11 N•m (97 lbf•**in**). Replace strap if worn or torn.

NOTE: When towing a load, it is suggested to adjust stopper strap to a shorter length and stiffen rear springs. These adjustment will improve steering ability.

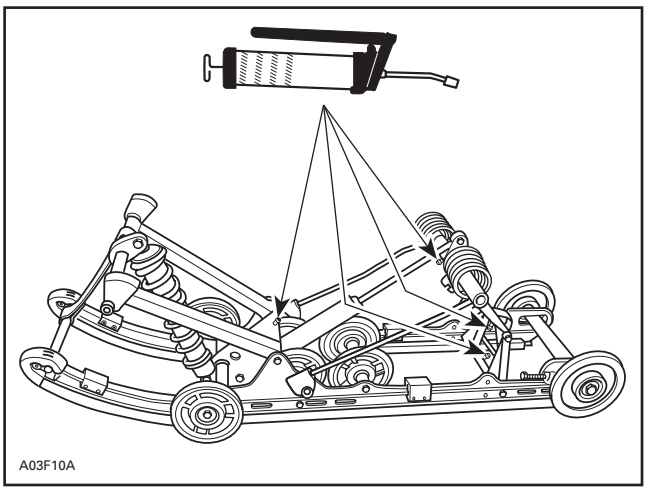
Deep Snow Operation

When operating the vehicle in deep snow, it may be necessary to change position of adjustment cams, stopper strap and/or driver's riding position, to change the angle at which the track rides on the snow. Operator's familiarly with the various adjustments as well as snow conditions will dictate the most efficient combination.

LUBRICATION

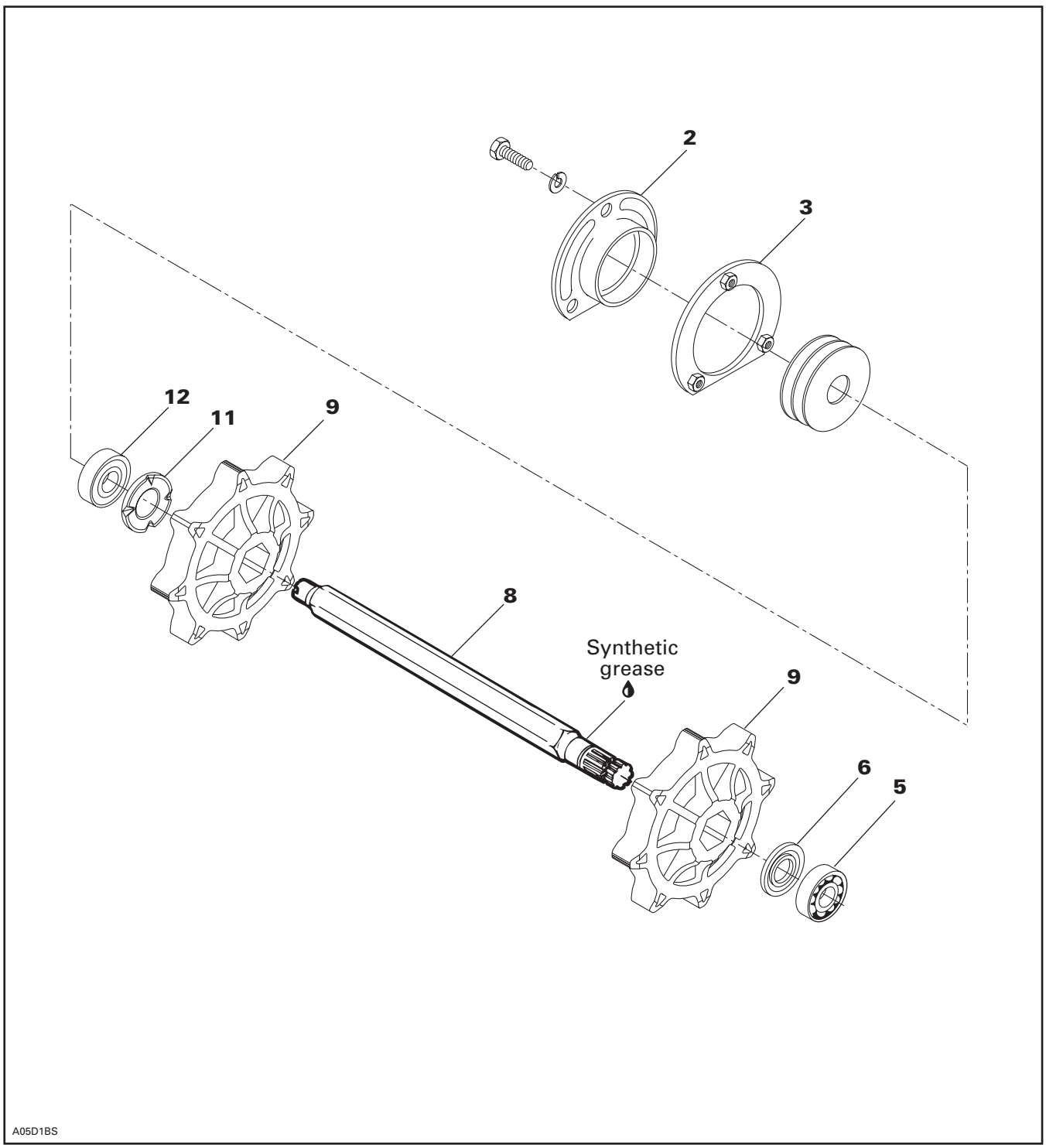
Lubricate front and rear arms at grease fittings using synthetic grease (P/N 413 711 500).

NOTE: There are 4 grease fittings.

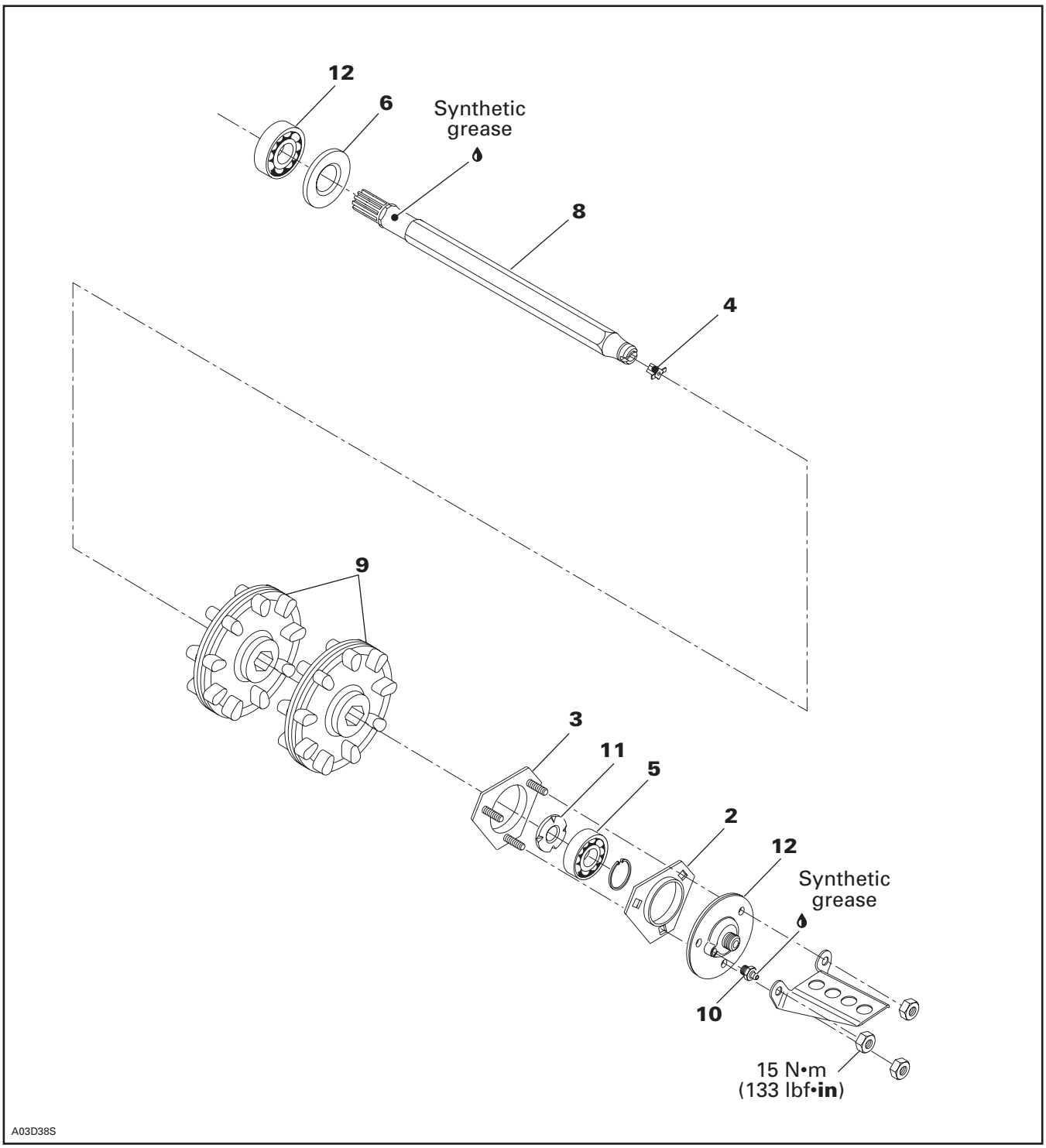


DRIVE AXLE

Tundra/R



S-Series


12
6
Synthetic grease
8
4
9
3
11
5
2
12
Synthetic grease
10
15 N•m
(133 lbf•in)
A03D38S

REMOVAL

All Models

Drain oil from chaincase. Remove chaincase cover and release drive chain tension (if applicable).

Raise and block rear of vehicle off the ground.

Remove suspension. (Refer to REAR SUSPENSION 07).

2,6, End Bearing Housing and Seal

NOTE: If vehicle is equipped with a speedometer, remove angle drive unit and coupling cable if necessary.

On all S-Series, remove chain and sprockets then circlip and bearing on drive axle.

Pry oil seals from chaincase and end bearing housing.

Unlock sprocket from drive axle and remove with its spacer (if applicable).

Push drive axle toward chaincase until end bearing housing studs clear off frame holes.

Release drive axle sprocket from track and at the same time, pulling the drive axle toward the end bearing housing side.

Remove drive axle from vehicle.

DISASSEMBLY

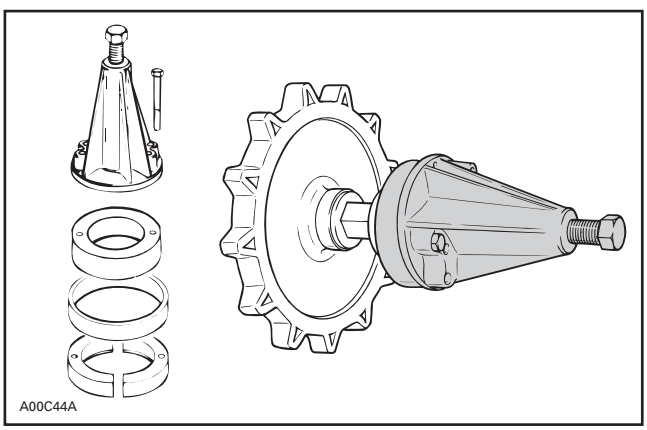
4, Speedometer Drive Insert

All Models

Remove speedometer drive insert (if applicable).

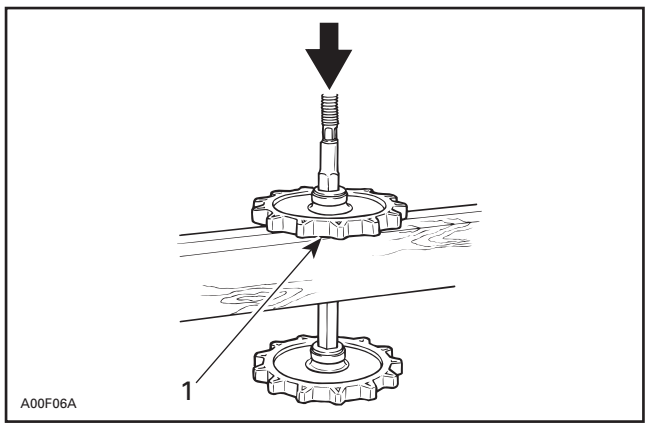
5,12, Bearing

To remove bearings, use puller assembly, ring and half rings as illustrated.



9,13, Sprocket and Half-Sprocket

To remove press fit sprockets, use a press and a suitable support as illustrated.

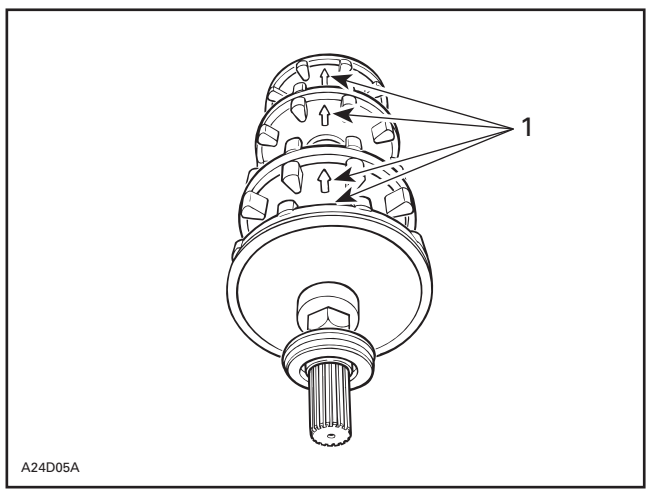


1. Support sprocket near hub

NOTE: Two different types of sprocket press fit can be found. Ensure to replace ring reinforced sprockets with the same type.

ASSEMBLY

Ensure to align indexing marks of each sprocket when assembling.

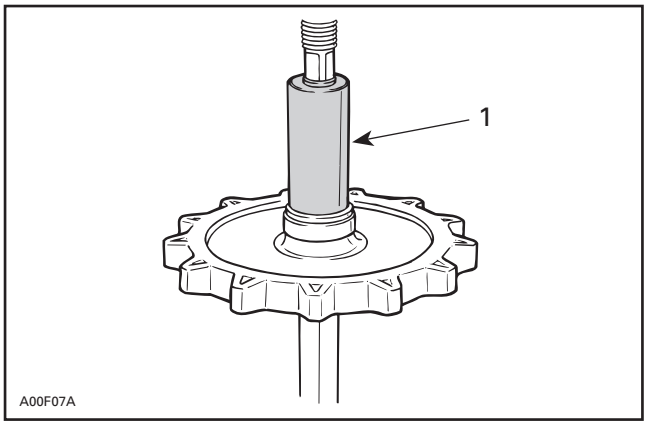


TYPICAL

1. Indexing marks aligned

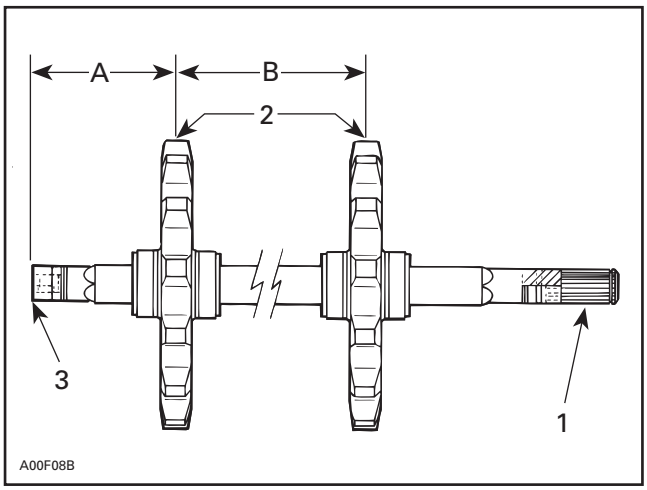
8,9,13, Drive Axle and Sprocket

To assemble press fit sprockets, use a press and a suitable pipe as illustrated. Sprockets must be assembled according to the following dimensions.



1. Pipe

Tundra/R

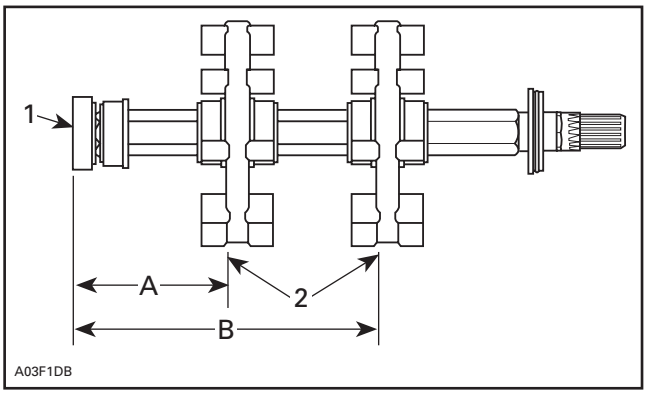


TYPICAL

1. Chaincase side
2. Center line of sprocket
3. Drive axle end

APPLICABLE MODEL	A mm (in)	B mm (in)
Tundra series	85.5 (3-23/64)	237 (9-21/64)

S-Series



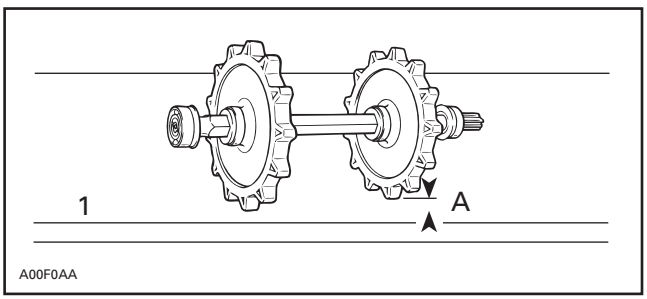
1. End of drive axle
2. Measure from sprocket side

APPLICABLE MODEL	A mm (in)	B mm (in)
S-Series	151.2 (5-15/16)	274.2 (10-51/64)

All Models

The maximum desynchronization for the sprockets is 1.5 mm (1/16 in).

To check this tolerance, place axle assembly on a plane surface and measure the gap between sprocket tooth and surface.



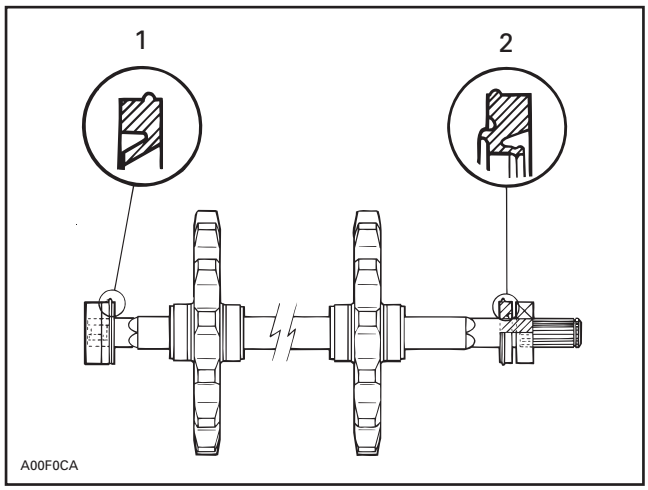
1. Plane surface
A. 1.5 mm (1/16 in) MAXIMUM

▼ CAUTION

The same sprocket must not be pressed twice on the axle. If synchronization is found to be defective, use a new sprocket.

6,8, Drive Axle and Seal

When assembling drive axle, always position a new seal on each end of drive axle (chaincase side only on Tundra series). Locate seal lip as illustrated.



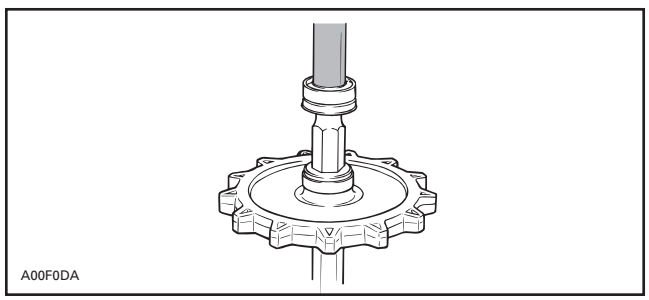
1. Grease seal type
2. Oil seal type

11, Bearing Protector

At assembly, flat side of bearing protector must be against bearing.

5,12, Bearing

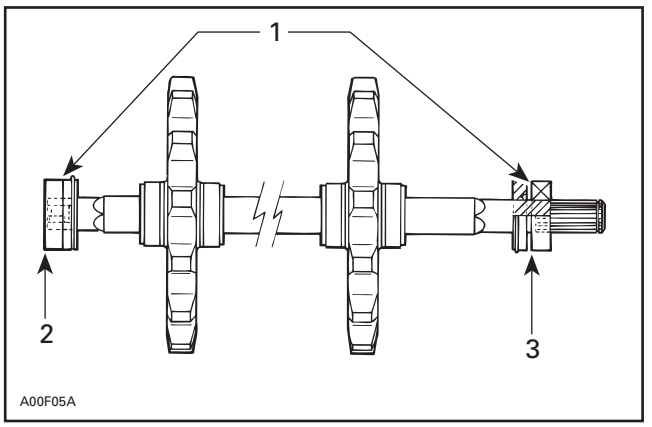
Always push bearing by inner race.



The bearing on the splined side of axle must be pushed until it is seated on shaft shoulder. On S-series bearing shield must face chaincase.

The end bearing housing bearing must be flush with end of drive axle. On S-Series bearing shield must face sprocket.

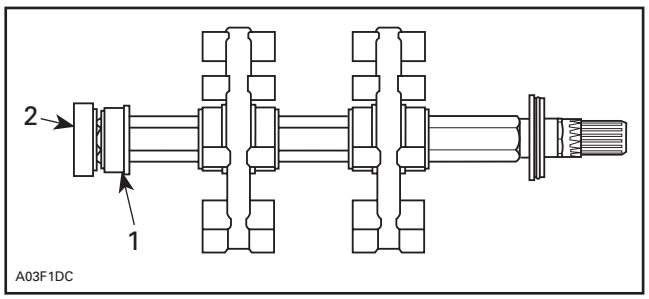
On Tundra series both bearings must have their shield facing the sprocket.



TUNDRA SERIES

1. Bearing shield on this side
2. Flush with drive axle
3. Seated on shaft shoulder

NOTE: On S-Series bearing on chaincase side is installed after the drive axle.



S-SERIES — TYPICAL

1. Bearing shield on this side
2. Flush with drive axle

S-SERIES — TYPICAL

1. Bearing shield on this side

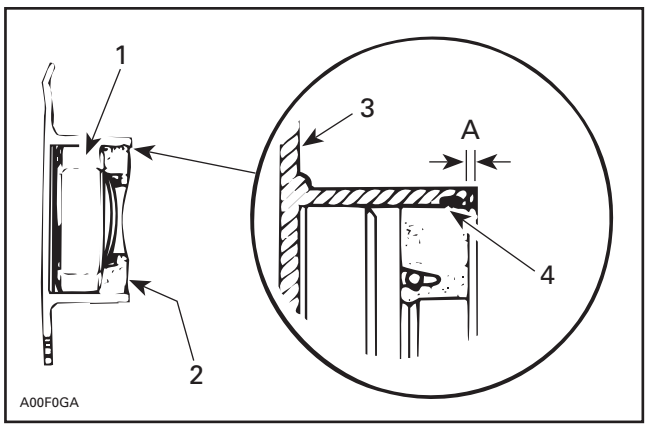
INSTALLATION

4, Speedometer Drive Insert

If the drive axle to be installed is a new part and the vehicle is equipped with a speedometer, a correct size speedometer drive insert must be installed into the axle end. Ensure that insert is flush with end of axle.

Position drive axle assembly into location. Install end bearing housing. Install spacer (if applicable) between bearing and lower chaincase sprocket.

Install chaincase and position seals (if applicable), making sure that a gap of approximately 2 mm (1/16 in) exists between end of bearing housing and each seal.



SIDE VIEW

1. *Bearing*
2. *Seal*
3. *Housing*
4. *Seal lip*

A. 2 mm approx.

3, Retainer Ring

Make sure that welded nuts are toward inside of tunnel.

Lock drive axle sprocket with a circlip.

Reinstall the chaincase cover (if applicable).

Refill with chaincase oil.

Install the suspension. Refer to TRACK 07-05 and adjust track tension and carry out track alignment procedure.

LUBRICATION

15, Grease Fitting

Lubricate end housing bearing with synthetic grease (P/N 413 711 500).

ADJUSTMENT

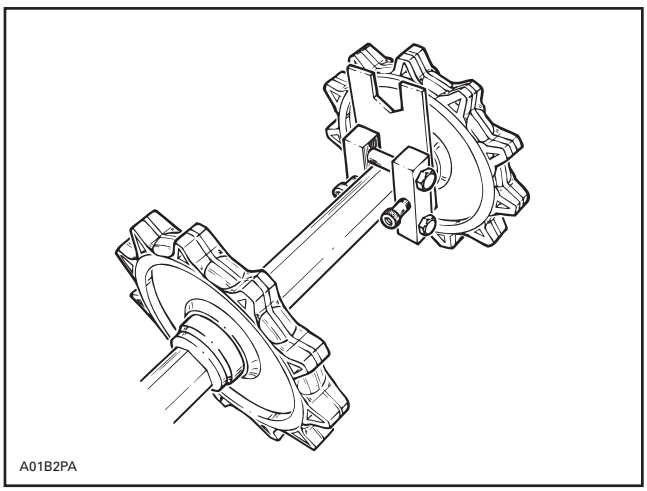
Sprocket/Track Alignment

▼ CAUTION

Do not temper with sprocket/track alignment if frame or suspension is damaged.

Sprockets might be repositioned to fit track holes (lugs on S-Series) without removing drive axle.

Use drive axle sprocket adjuster kit (P/N 861 725 700).



TYPICAL

TRACK

TRACK TYPE APPLICATION

Refer to TECHNICAL DATA 10.

GENERAL

This section gives guidelines for track removal. Some components require more detailed disassembly procedures. In these particular cases, refer to the pertaining section in this manual.

INSPECTION

Visually inspect track for:

– cuts and abnormal wear
– broken rods
– broken or missing track cleats

If track is damaged or rods are broken, replace track. For damaged or missing cleats, see procedure below.

◆ WARNING

Do not operate a snowmobile with a cut, torn or damaged track.

REMOVAL

Tundra/R

Remove the following items:

– chaincase cover, sprockets, chain
– muffler
– upper center idler ass'y
– suspension
– end bearing housing
– drive axle seal
– drive axle (outwards from end bearing housing)
– track

S-Series

Remove the following items:

– speedometer cable
– muffler
– chaincase cover
– suspension
– drive axle seal
– end bearing housing
– sprockets and chain
– drive axle (toward end bearing housing)
– track

INSTALLATION

All Models

Reverse the removal procedure.

NOTE: When installing the track, respect rotation direction indicated by an arrow on track thread.

Check sprocket/track alignment as described in DRIVE AXLE 07-04.

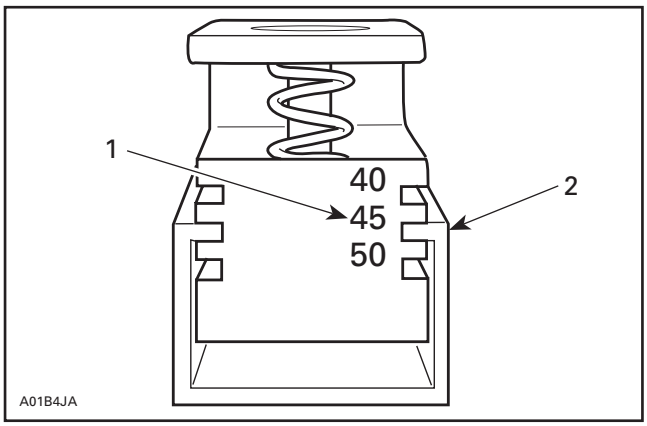
Track Tension and Alignment

Track tension and alignment are interrelated. Do not adjust one without checking the other. Track tension procedure must be carried out prior to track alignment.

Tension

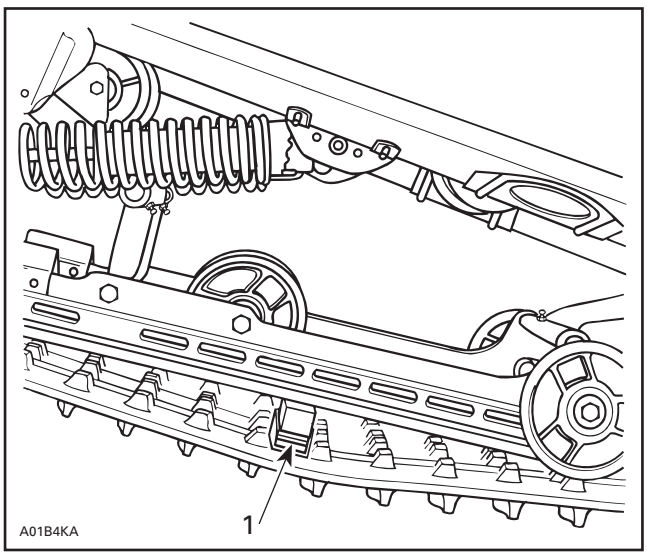
Lift the rear of vehicle and support with a mechanical stand. Allow the slide to extend normally. Check the gap half-way between front and rear idler wheels. Measure between slider shoe and bottom inside of track.

When using the track tension gauge (P/N 529 021 500), slide U shape extrusion to proper deflection.



1. Example 45 mm
2. Extrusion

Insert pre-setted gauge between slider shoe and track. Allow gauge to settle by forcing track up and down. Track tension is as specified when edge of gauge reaches line.

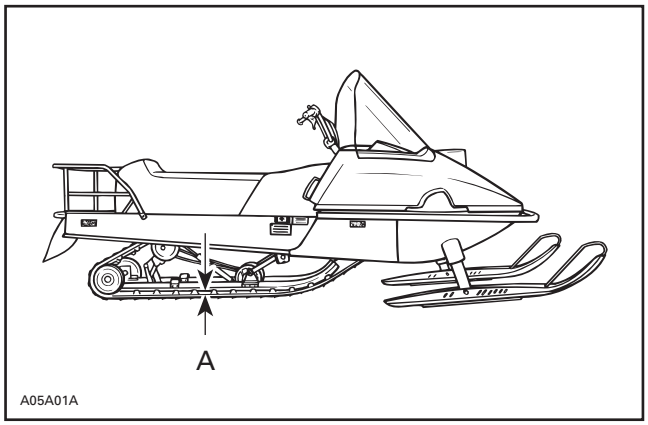


TYPICAL
1. Line

NOTE: Lightly oil track tension gauge center pin to avoid sticking.

Tundra/R

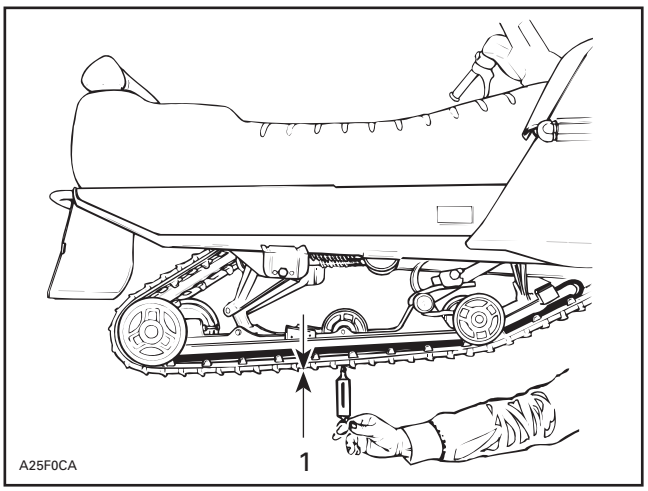
35 to 40 mm (1-3/8 to 1-9/16 in) when exerting a downward pull of 7.3 kg (16 lb).



A. 35 to 40 mm (1-3/8 to 1-9/16 in)

S-Series

35 to 40 mm (1-3/8 to 1-9/16 in) when exerting a downward pull of 7.3 kg (16 lb).



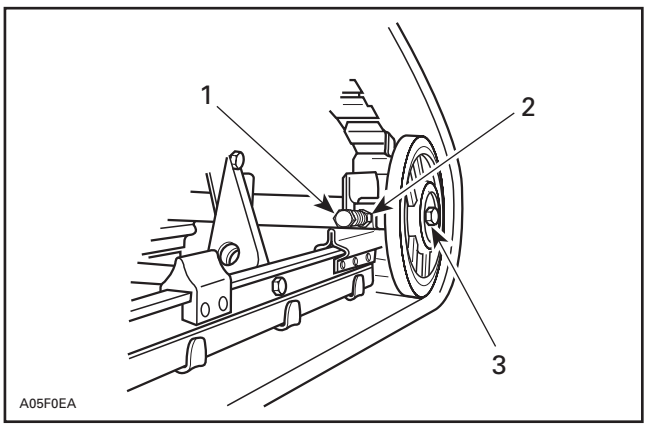
TYPICAL
1. 35 to 40 mm (1-3/8 to 1-9/16 in) with 7.3 kg (16 lb)

All Models

▼ CAUTION

Too much tension will result in power loss and excessive stress on suspension components. If too loose, the track will have a tendency to thump.

To adjust, loosen the rear idler wheel retaining screws (1 side only on Tundra/R and S-Series) and the adjuster bolt lock nut; then loosen or tighten the adjuster bolts located on the inner side of the rear idler wheels.



TYPICAL

1. *Adjuster bolt*
2. *Lock nut (except S-Series)*
3. *Retaining screw*

Alignment

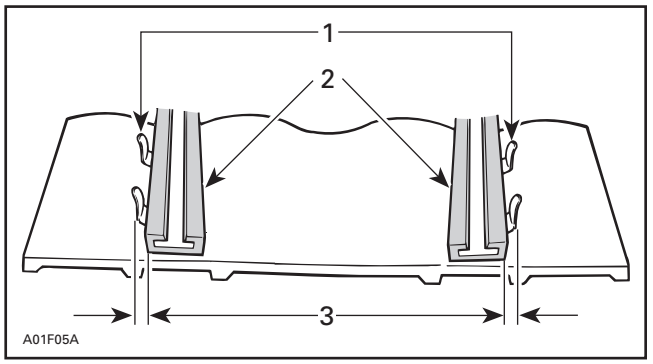
◆ WARNING

Before checking track tension, ensure that the track is free of all particles which could be thrown out while it is rotating. Keep hands, tools, feet and clothing clear of track. Ensure no one is standing in close proximity to the vehicle.

All Models

With rear of vehicle supported off the ground, start engine and allow the track to rotate **slowly**.

Check that the track is well centered; equal distance on both sides between edges of track guides and slider shoes.

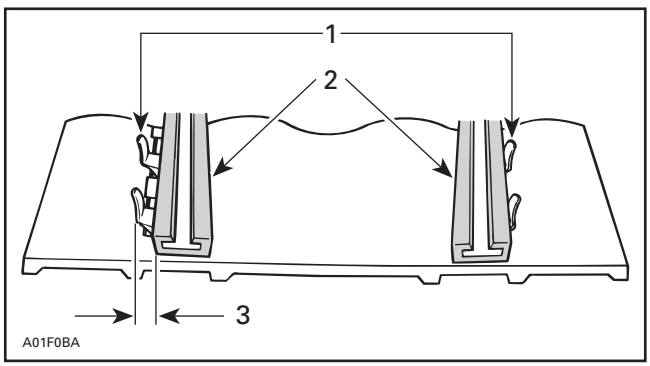


1. *Guides*
2. *Slider shoes*
3. *Equal distance*

◆ WARNING

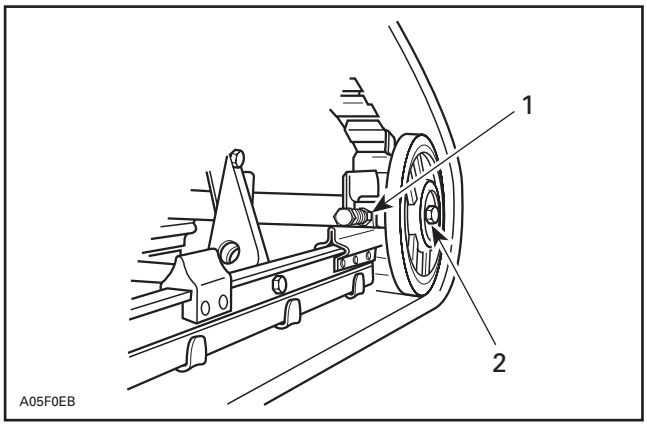
Before checking track alignment, ensure that the track is free of all particles which could be thrown out while track is rotating. Keep hands, tools, feet and clothing clear of track.

To correct, stop engine then loosen the lock nuts and tighten the adjuster bolt on side where guides are farthest to slide. Tighten lock nuts and recheck alignment.



1. *Guides*
2. *Slider shoes*
3. *Tighten on this side*

Tighten lock nuts and the idler wheel retaining screws.



TYPICAL

1. *Retighten (except S-Series)*
2. *Retighten*

Restart engine, rotate track **slowly** and recheck alignment.

TRACK CLEAT

Removal

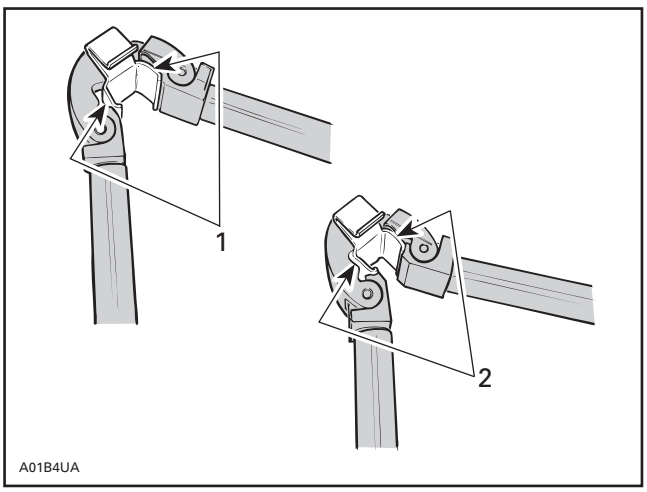
– Raise rear of vehicle off the ground and lift snow guard then rotate track to expose a cleat to be replaced.

– Using track cleat remover (P/N 529 008 200) for Tundra/R. Use (P/N 529 008 700) for all other models.

Installation

NOTE: Keep the same pitch between guide cleats.

– Place new cleat in position and using small track cleat installer (P/N 529 008 500) for Tundra/R or cleat installer (P/N 529 028 800) for S-Series, bend cleat then push tabs into rubber.



TYPICAL

1. *First step*
2. *Second step (to push tabs into rubber)*