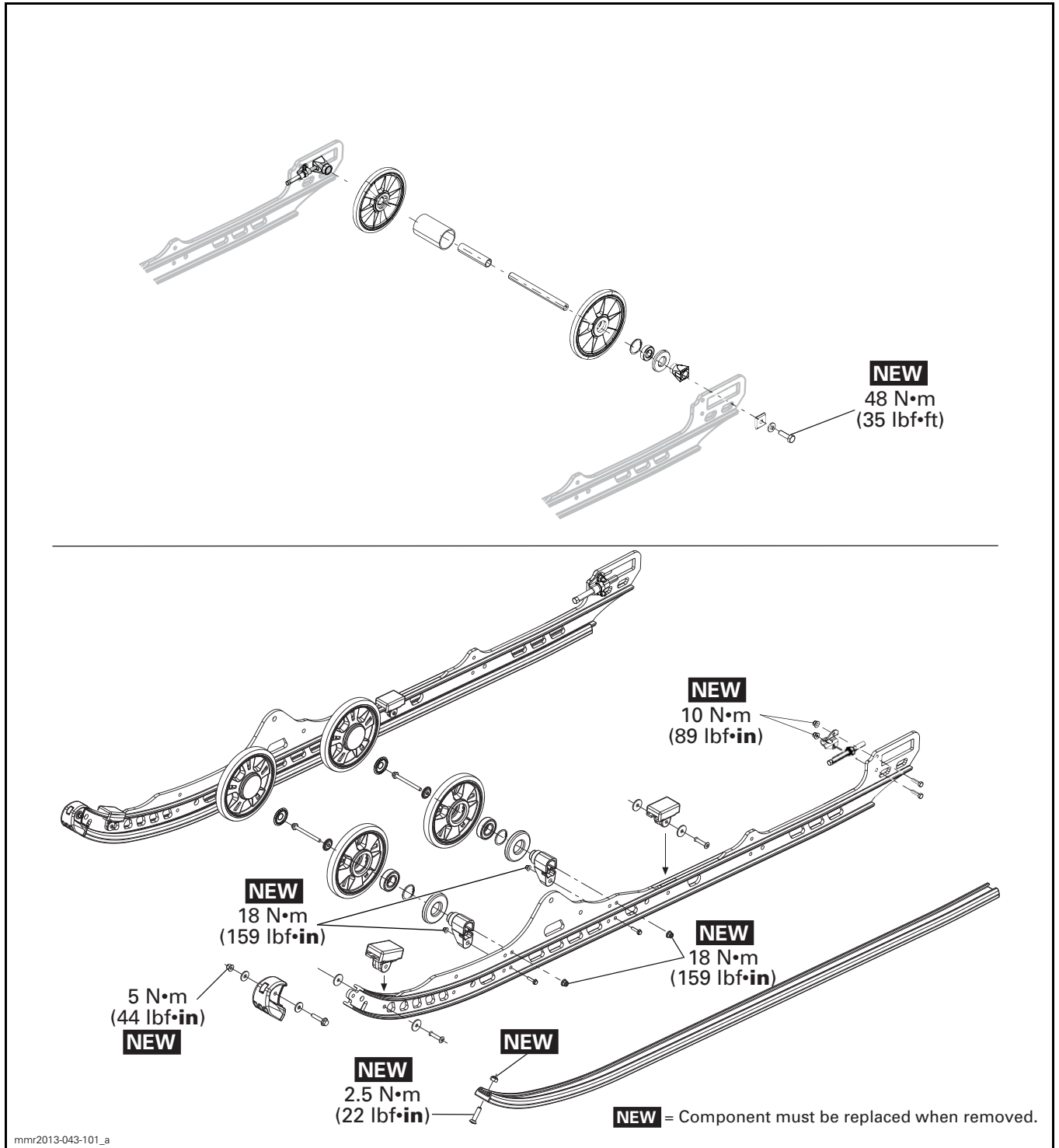
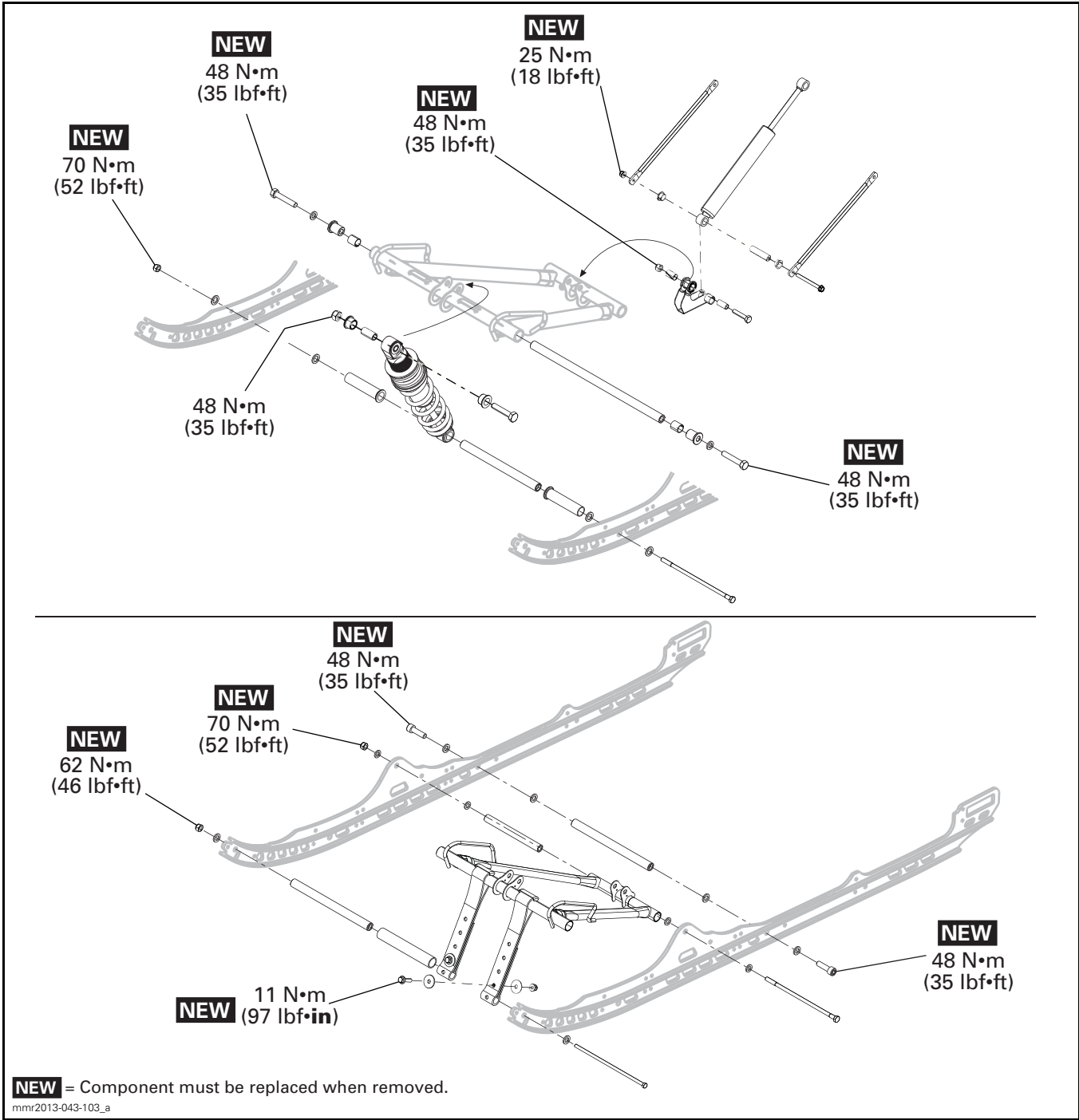


# REAR SUSPENSION (tMOTION)

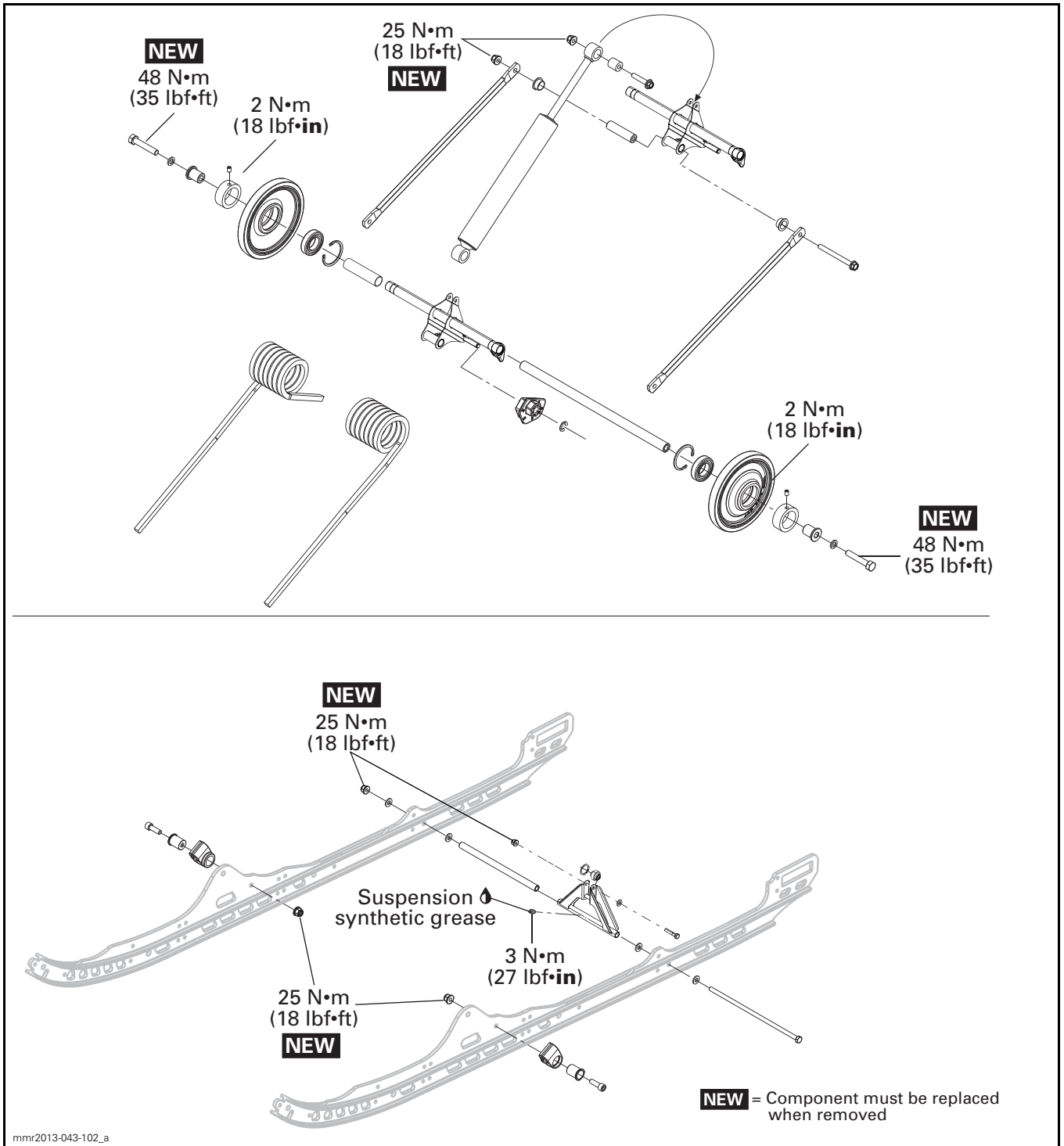
## RAILS AND IDLER WHEELS



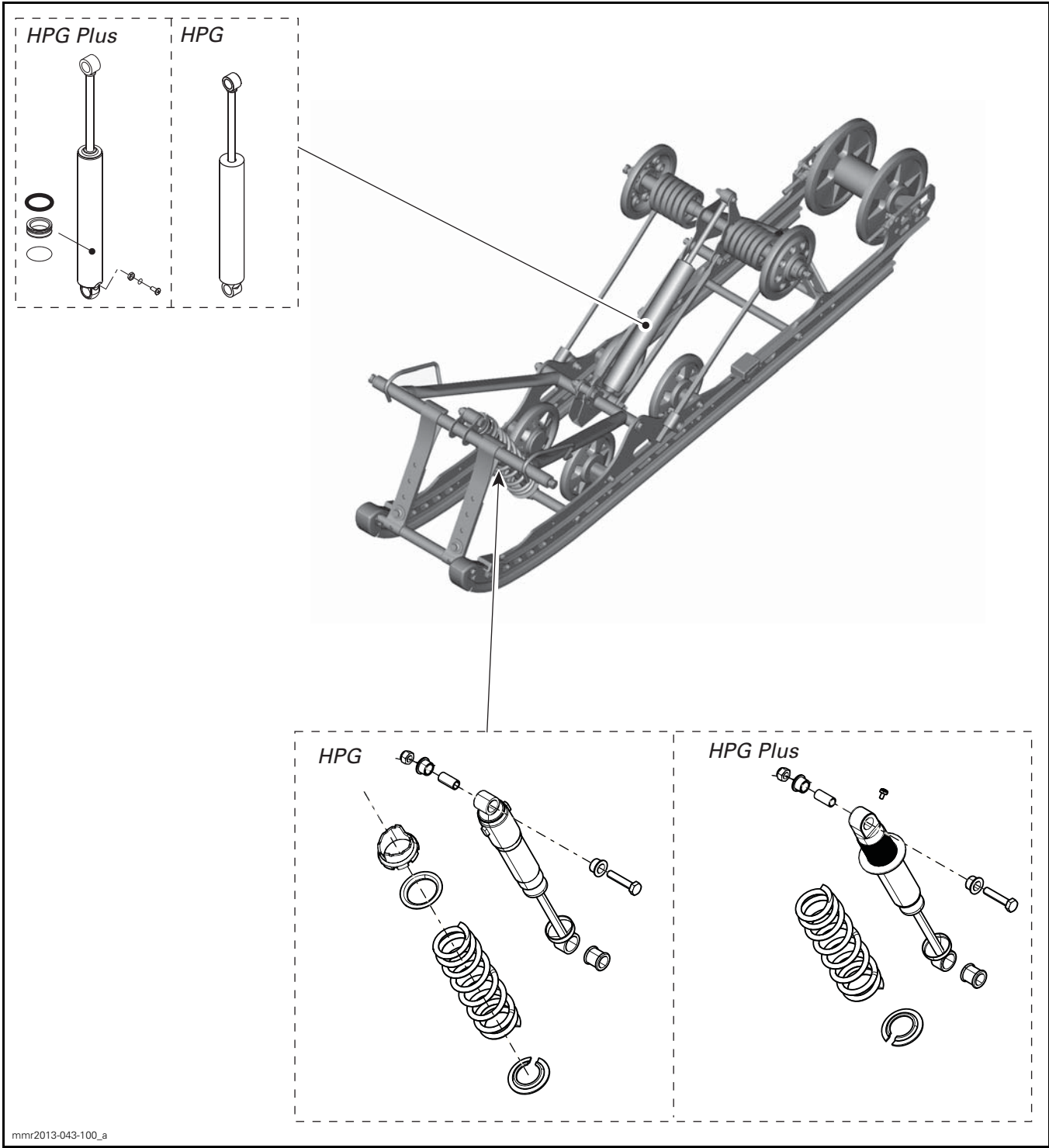
FRONT ARM



## REAR ARM



SHOCK ABSORBERS



# GENERAL

**NOTE:** Refer to *TECHNICAL SPECIFICATIONS* to identify the snowmobile suspension type.

During assembly/installation, use torque values and service products as in the exploded views.

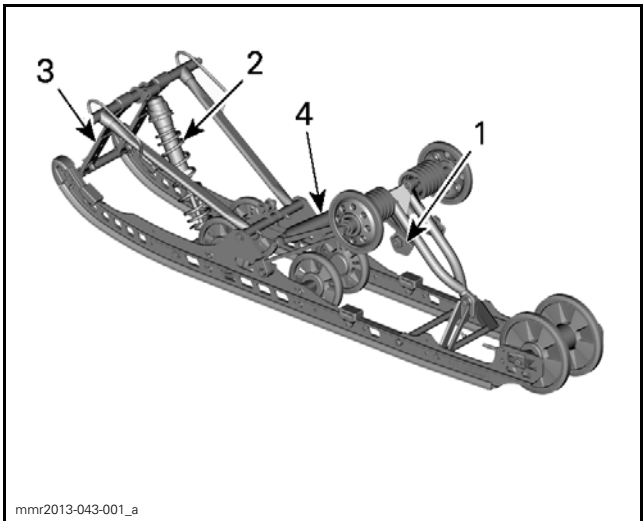
Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

## ⚠ WARNING

Torque wrench tightening specifications must be strictly adhered to.  
Locking devices when removed (e.g.: locking tabs, cotter pins, etc.) must replaced.

# ADJUSTMENT

## REAR SUSPENSION ADJUSTMENTS



**TYPICAL - ADJUSTABLE COMPONENTS**

- 1. Rear springs
- 2. Center spring
- 3. Stopper strap
- 4. Rear shock absorber

**NOTICE** Whenever adjusting rear suspension, check track tension and adjust if necessary.

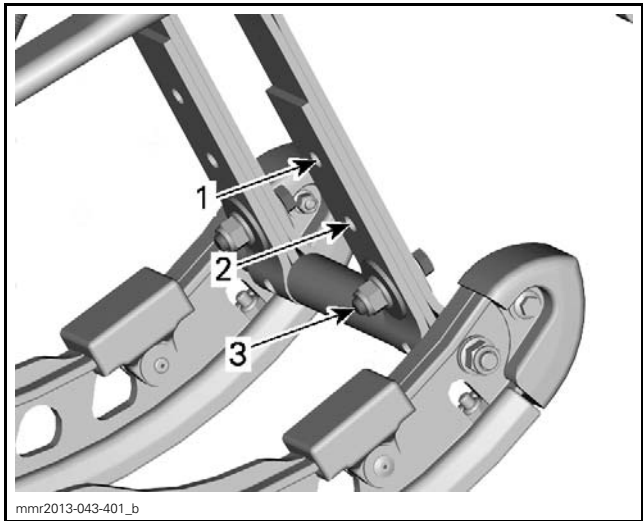
## Stopper Strap

Stopper strap length has an effect on the amount of weight the center spring has to carry especially during acceleration, therefore on the front end up-lift.

Stopper strap length also has an effect on center spring travel.

**NOTICE** Whenever stopper strap length is changed, track tension must be checked.

ACTION	RESULT
Increasing stopper strap length	Lighter ski pressure under acceleration
	More center spring travel
	More bump absorption capability
Decreasing stopper strap length	Heavier ski pressure under acceleration
	Less center spring travel
	Less bump absorption capability



### TYPICAL

- 1. Position 1 (longest)
- 2. Position 2
- 3. Position 3 (factory setting)
- 4. Position 4 (not shown)
- 5. Position 5 (not shown - shortest)

**NOTE:** Position 4 and 5 hidden on this illustration. Always install stopper strap bolt as close as possible to the lower shaft.

When operating the snowmobile in deep snow or hill climbing, it may be necessary to vary stopper strap length and/or riding position, to change the angle at which the track rides on the snow. Operator's familiarity with the various adjustments as well as snow conditions will dictate the most efficient combination.

Generally, a longer stopper strap setting gives better performance in deep snow on a flat landscape and a shorter setting will improve handling in steep hill climbing conditions.

Subsection XX (REAR SUSPENSION (tMOTION))

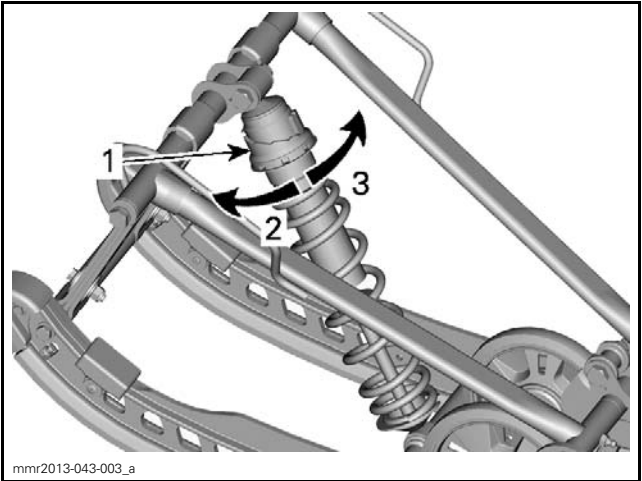
STOPPER STRAP SETTING	
POSITION	USE
1	Not used
2	Boon docking: <ul style="list-style-type: none"><li>– Better boon docking manoeuvrability</li><li>– Better bump absorption</li><li>– Better deep snow starts (forward and reverse)</li></ul>
3	Factory setting: Best overall setting (General use)
4	Hill climb: <ul style="list-style-type: none"><li>– Better track attack angle for hill climbing</li></ul>
5	Steep hill climb: <ul style="list-style-type: none"><li>– Better track attack angle for hill climbing</li><li>– Less transfer</li><li>– Lower ride height</li></ul>

Center Spring

Center spring preload has an effect on steering effort, handling and bump absorption.

Also, since center spring preload adjustment puts more or less pressure on the front of the track, it has an effect on the performance in deep snow.

ACTION	RESULT
Increasing preload	Lighter steering
	More bump absorption capability
	Better deep snow starts
	Better deep snow performance and handling
Decreasing preload	Heavier steering
	Less bump absorption capability
	Better trail handling



CAM TYPE SHOWN - HPG™ SHOCK ABSORBER  
1. Spring preload adjustment cam  
2. Decrease preload  
3. Increase preload

**NOTE:** Use the suspension adjustment tool provided in the tool kit.

Rear Springs

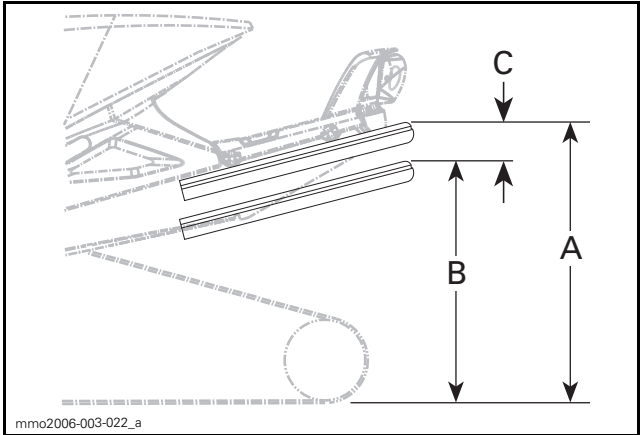
Rear spring preload has an effect on comfort, ride height and load compensation.

Also, adjusting rear spring preload shifts more or less weight to the snowmobile front end. As a result, more or less weight is applied to the skis. This has an effect on performance in deep snow, steering effort and handling.

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

ACTION	RESULT
Increasing preload	Firmer rear suspension
	Higher rear end
	More bump absorption capability
	Heavier steering
Decreasing preload	Softer rear suspension
	Lower rear end
	Less bump absorption capability
	Lighter steering
	Better deep snow performance and handling

Refer to the following to determine if preload is correct.



**TYPICAL — PROPER ADJUSTMENT**

- A. Suspension fully extended  
B. Suspension has collapsed with operator, passenger and load added  
C. Distance between dimension "A" and "B", see table below

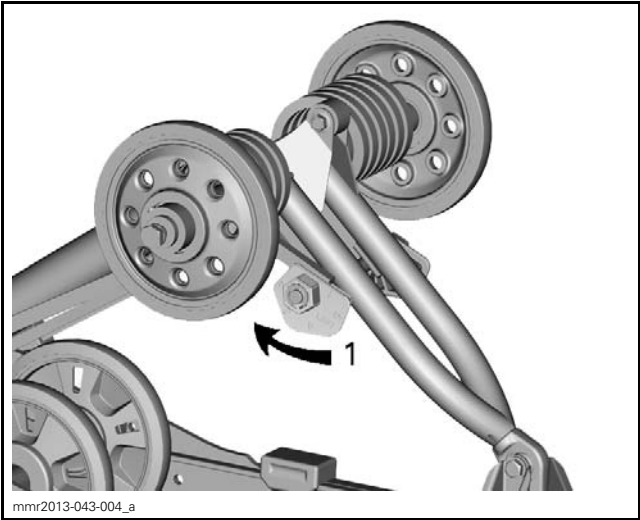
146/154/163" MODELS	
"C"	WHAT TO DO
65 mm to 100 mm (2.5 in to 4 in)	No adjustment required
More than 100 mm (4 in)	Adjusted too soft. Increase preload
Less than 65 mm (2.5 in)	Adjusted too firm. Decrease preload

**NOTE:** If the specification is unattainable with the original springs, refer to the applicable *SPRING CHART* bulletin for other available springs.

**NOTICE** To increase spring preload, always turn the left side adjustment cam in a clockwise direction, and the right side cam in a counter-clockwise direction.

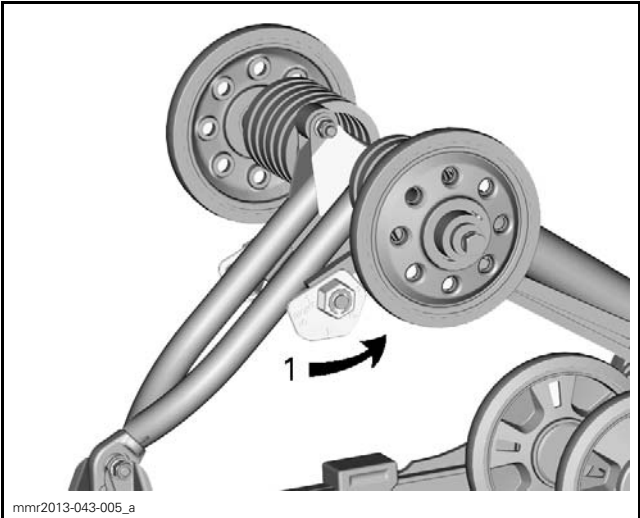
**CAUTION** Never set preload cams directly from position 5 to 1 or directly from position 1 to 5.

The adjustment cams have 5 different settings, 1 being the softest.



**TYPICAL —LH SIDE**

1. Adjust spring preload



**TYPICAL —RH SIDE**

1. Adjust spring preload

## MAINTENANCE

For rear suspension lubrication, mechanism and stopper strap inspection, refer to *PERIODIC MAINTENANCE PROCEDURES*.

For shock absorbers inspection, refer to *SHOCK ABSORBERS* in this subsection.

## PROCEDURES

**NOTE:** Many parts can be changed with rear suspension in place. When specified, refer to *SUSPENSION ASSEMBLY* to remove rear suspension from vehicle.

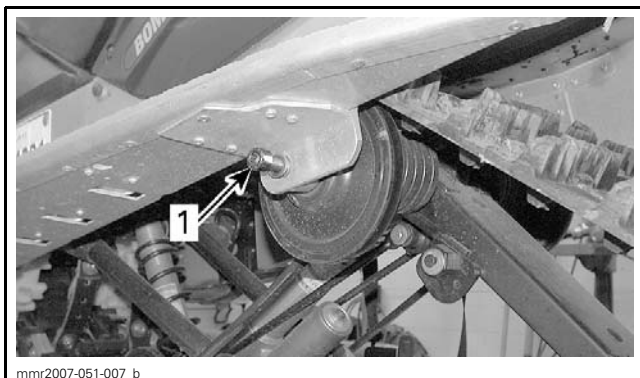
## SUSPENSION ASSEMBLY

### Suspension Assembly Removal

1. Lift rear of vehicle and support it off the ground.

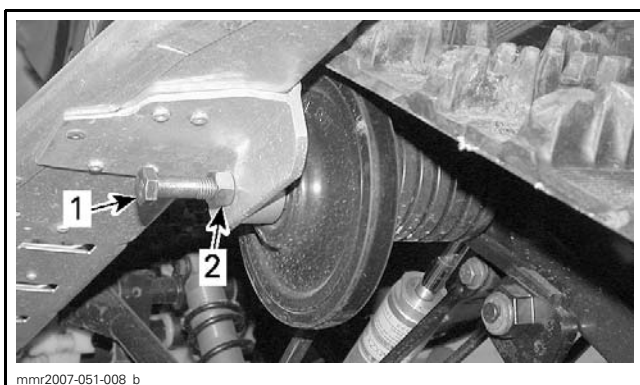
## Subsection XX (REAR SUSPENSION (tMOTION))

2. Completely loosen track tension.
3. Remove and discard rear arm bolts from chassis. Use the following procedure to remove bolts easily.
  - 3.1 Unscrew one of the socket screws securing the rear arm to frame.



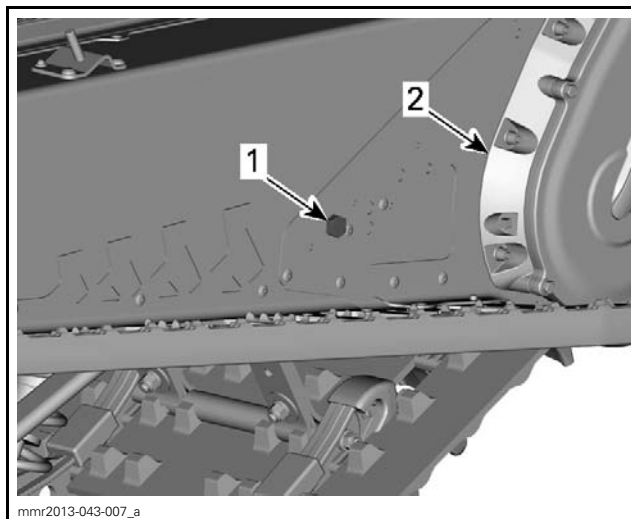
**TYPICAL**  
1. Socket bolt

- 3.2 Replace this socket screw with an hexagonal bolt (longer than socket screw) and a nut.
  - 3.3 Screw in the hexagonal bolt by approximately 7 turns.
  - 3.4 Hold the hexagonal bolt and tighten locking nut.



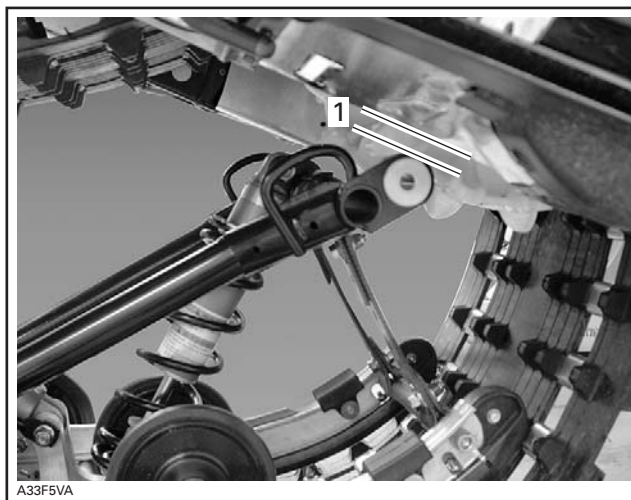
**TYPICAL**  
1. Hexagonal bolt  
2. Locking nut

- 3.5 Unscrew the socket screw on the other side then unlock nut and remove the hexagonal bolt.
4. Remove bolts retaining front arm to tunnel.  
**NOTE:** Discard the front arm bolts.



**TYPICAL**  
1. Front arm bolt  
2. Chaincase

5. Lift rear of vehicle until front arm as enough clearance to pass underneath tunnel.



**TYPICAL**  
1. Enough clearance



TYPICAL — REMOVE SUSPENSION

## Suspension Assembly Installation

Installation is the reverse of removal procedure. Pay attention to the following.

Inspect track thoroughly before reinstalling suspension. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

Install suspension into track with front portion first.

Install **NEW** front arm nuts.

Install **NEW** rear arm screws.

Tighten screws to specified torque.

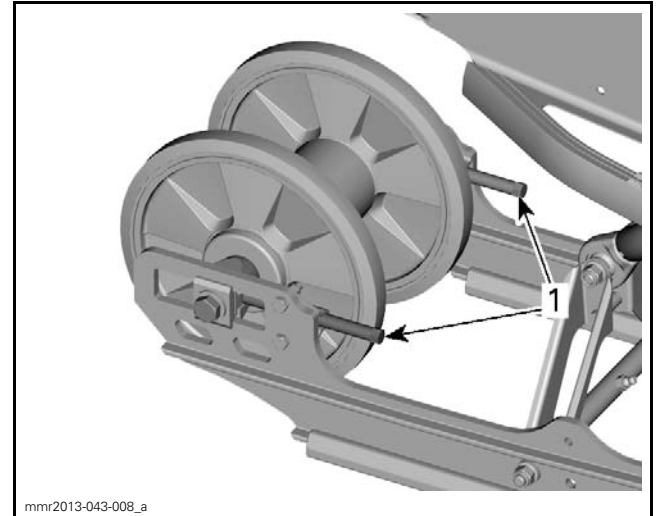
UPPER SUSPENSION ARM FASTENERS TIGHTENING TORQUE	
Front arm nuts	48 N•m (35 lbf•ft)
Rear arm screws	48 N•m (35 lbf•ft)

Adjust track tension, refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

## REAR AXLE

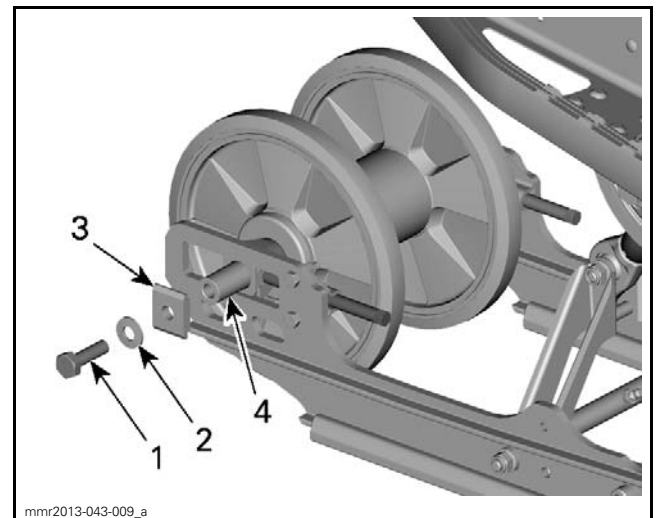
### Rear Axle Removal

1. Lift rear of vehicle and support it off the ground.
2. Loosen rear axle screws (one each side).
3. Completely loosen track tension by unscrewing both adjustment screws.



1. Adjustment screws

4. Remove both rear axle screws.
5. Remove rear idler wheels, seals and wheel spacers.



**RH SIDE SHOWN**  
1. Retaining screw  
2. Washer  
3. Slider  
4. Rear axle

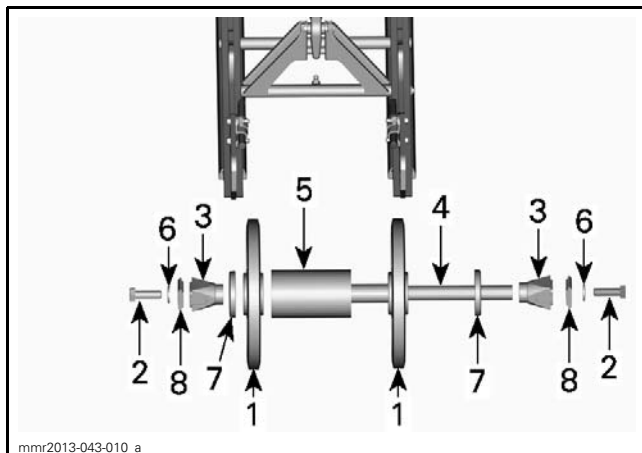
6. Pull out the rear axle.
7. Remove spacer, washers and inner idler wheel(s).

### Rear Axle Installation

Installation is the reverse of removal procedure. However, pay attention to the following.

1. Make sure to position all parts correctly.

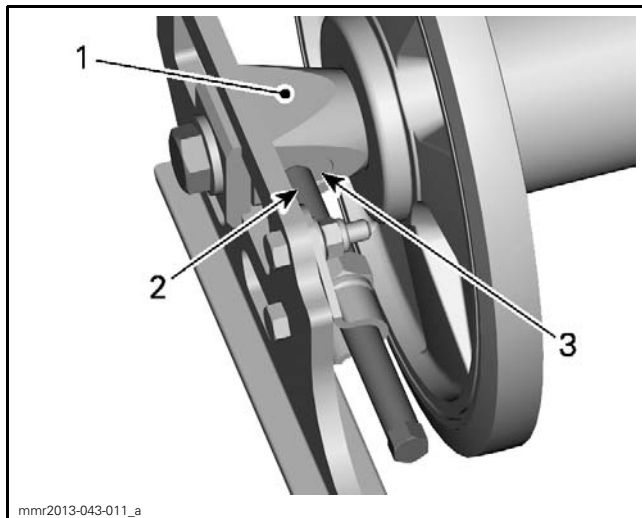
## Subsection XX (REAR SUSPENSION (tMOTION))



### 2 IDLER WHEELS LAYOUT

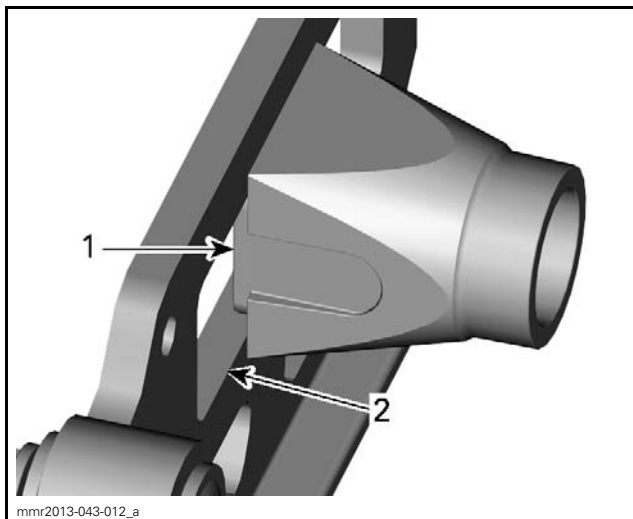
1. Idler wheels
2. Retaining screws
3. Slider
4. Rear axle
5. Rear axle spacer
6. Washers
7. Seals
8. Slider

2. Position wheel spacers with a flat side up and a groove in front of tensioner screw.



1. Flat side of wheel spacer
2. Tensioner screw
3. Tensioner screw

**NOTE:** When tightening rear axle, make sure each wheel spacer protuberance is engaged into runner slot.



1. Wheel spacer protuberance
2. Runner slot

3. Adjust track tension. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

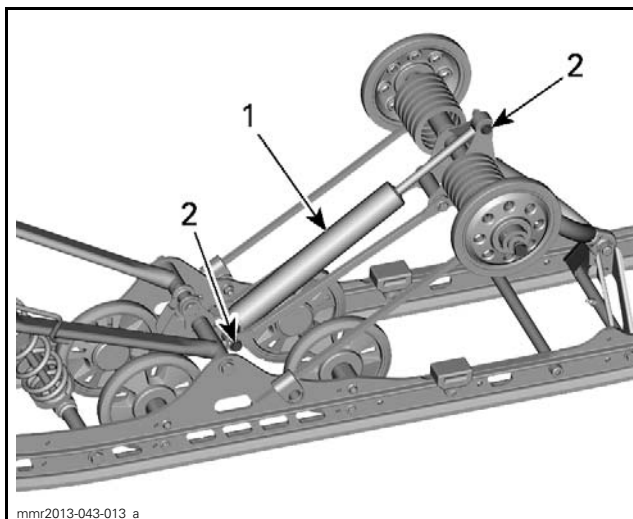
## SHOCK ABSORBERS

### Rear Shock Absorber Removal

1. Lift rear of vehicle and support it off the ground.

**NOTE:** If necessary, to ease shock removal, unfasten stopper strap to release shock pressure.

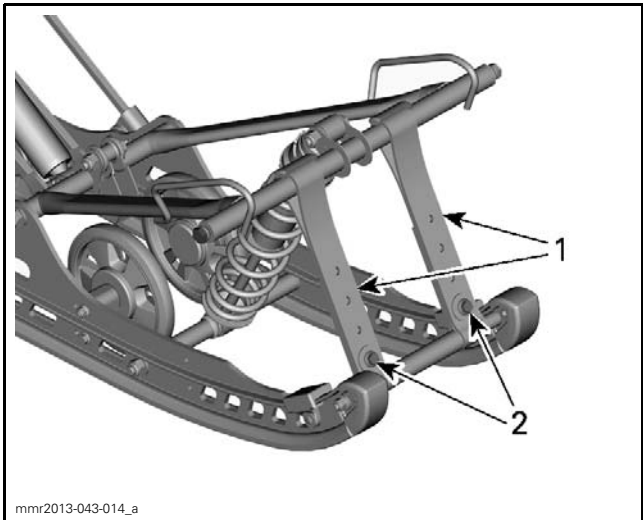
2. Remove bolts and nuts from shock.



1. Rear shock absorber
2. Remove bolts and nuts

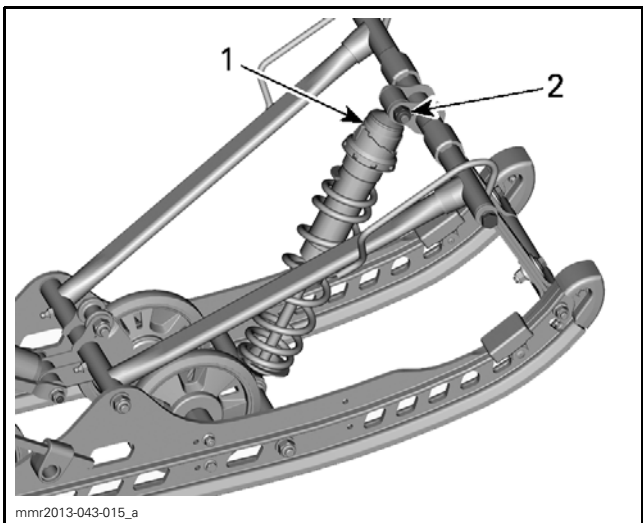
### Center Shock Absorber Removal

1. Lift the rear of vehicle and support it off the ground.
2. Unfasten stopper strap(s).



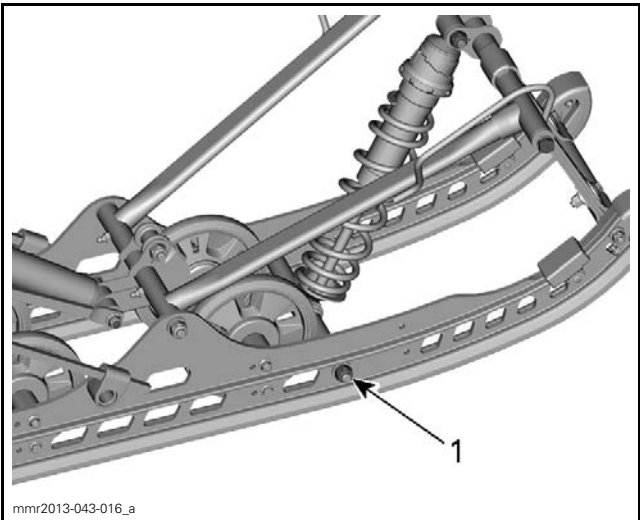
- 1. Stopper strap
- 2. Stopper strap bolt

3. Remove upper shock absorber bolt.



- 1. Front shock absorber
- 2. Remove bolt and nut

4. Remove and discard socket screws (one each side) securing shock shaft.



- 1. RH socket screw

5. Remove shock absorber from vehicle.

6. Remove bushings and shock shaft from shock absorber.

### Shock Absorber Inspection

Refer to *REAR SUSPENSION (rMOTION)* subsection for complete procedures.

### Shock Absorber Rebuilding

Refer to *REAR SUSPENSION (rMOTION)* subsection for complete procedures.

### Rear Shock Absorber Installation

Installation is the reverse of removal procedure. Pay attention to the following.

To ease shock installation, secure upper side of shock first.

Install **NEW** shock absorber retaining nuts and tighten to specified torque.

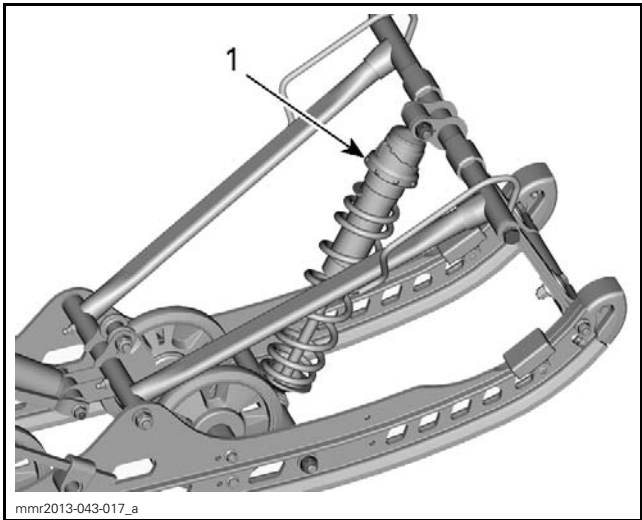
REAR SHOCK ABSORBER FASTENERS TIGHTENING TORQUE	
Upper nut	25 N•m (18 lbf•ft)
Lower nut	25 N•m (18 lbf•ft)

### Center Shock Absorber Installation

Installation is the reverse of removal procedure. Pay attention to the following.

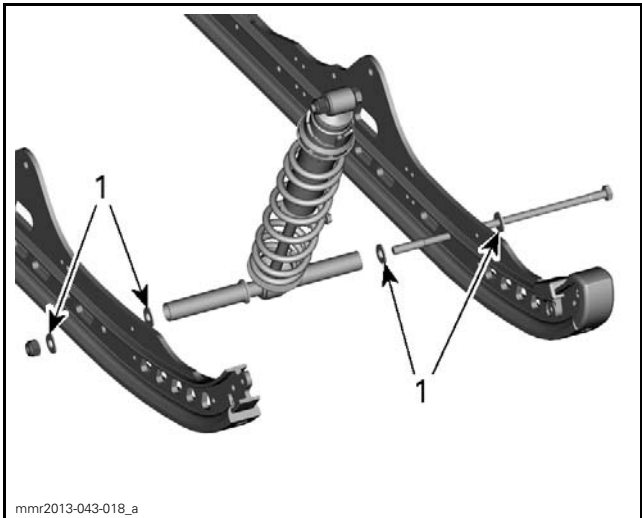
- 1. Position the adjustment ring or cam upwards and the valve (if so equipped) towards the tunnel.

Subsection XX (REAR SUSPENSION (tMOTION))



TYPICAL  
1. Cam

- 2. Using NEW socket screws, install shock shaft to runners.
- 3. Position washers in proper position.



BOTTOM OF SHOCK ABSORBER  
1. Washers location

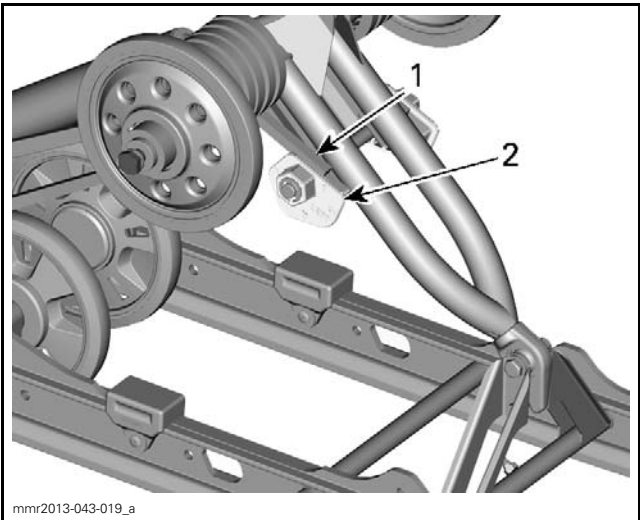
Tighten screws to the specified torque.

CENTER SHOCK ABSORBER LOWER FASTENERS TIGHTENING TORQUE
70 N•m (52 lbf•ft)

REAR SPRINGS

Rear Spring Removal

- 1. Lift rear of vehicle and support it off the ground.
- 2. Completely loosen track tension by unscrewing both adjustment screws.
- 3. Decrease springs preload by turning cams accordingly.

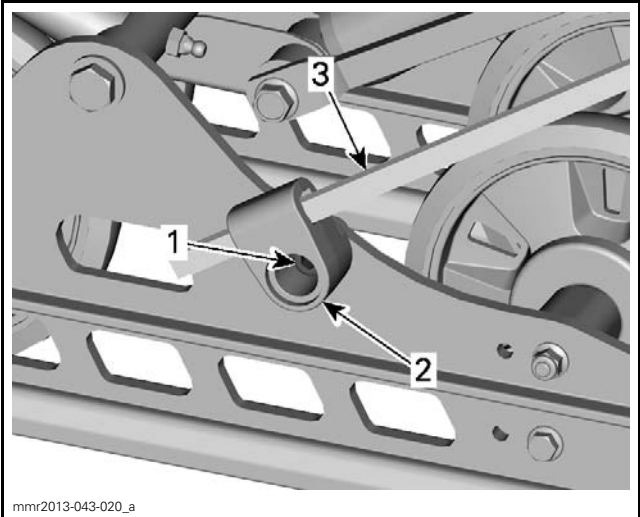


LH SIDE SHOWN  
1. Rear spring  
2. Cam

- 4. Firmly hold the spring support and unscrew its retaining bolt (one each side).

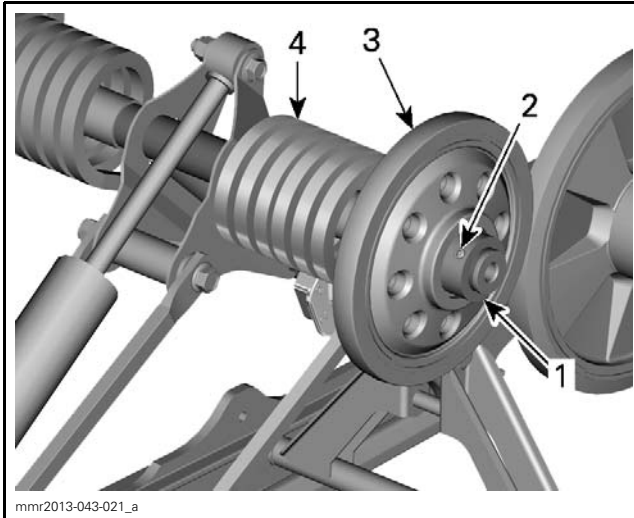
**WARNING**

Supports are spring loaded.



1. Spring support bolt  
2. Spring support  
3. Spring

- 5. Remove screws and washers from rear arm top axle.
- 6. Loosen set screw from locking rings.
- 7. Remove locking rings.
- 8. Remove upper idler wheels.
- 9. Remove springs.



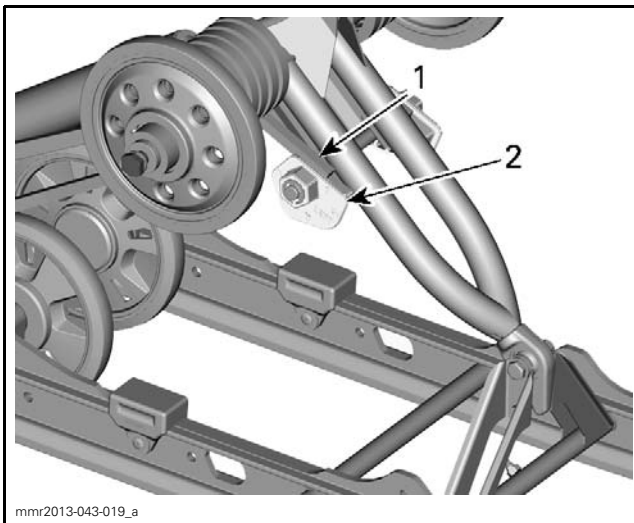
**LH SIDE SHOWN**

1. Locking ring
2. Set screw
3. Upper idler wheel
4. Rear spring

## Rear Spring Installation

Installation is the reverse of removal procedure. Pay attention to the following.

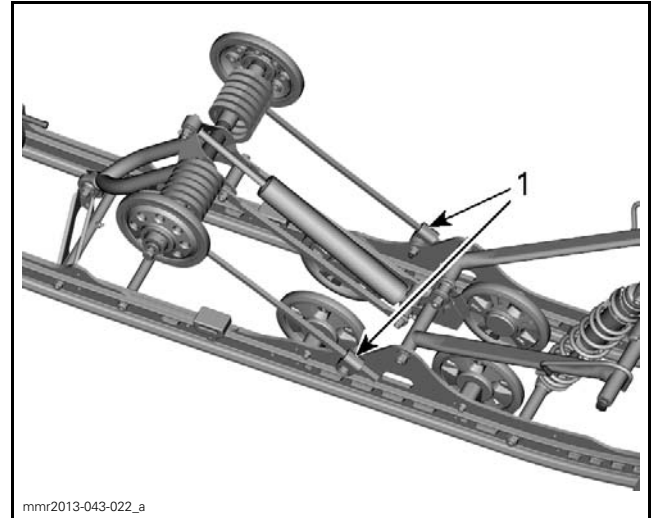
1. Respect THIS SIDE OUT inscription on top idler wheels.
2. Make sure that spring end is in cam adjuster.



**LH SIDE SHOWN**

1. Spring end
2. Cam

3. Install spring supports upwards.



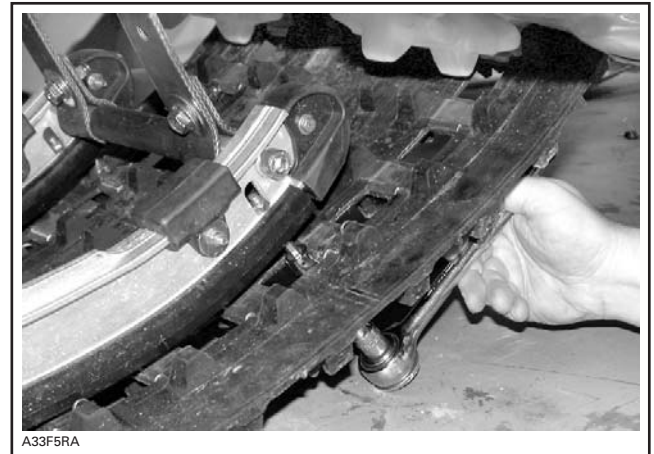
**TYPICAL**

1. Spring supports upwards

## SLIDER SHOES

### Slider Shoe Removal

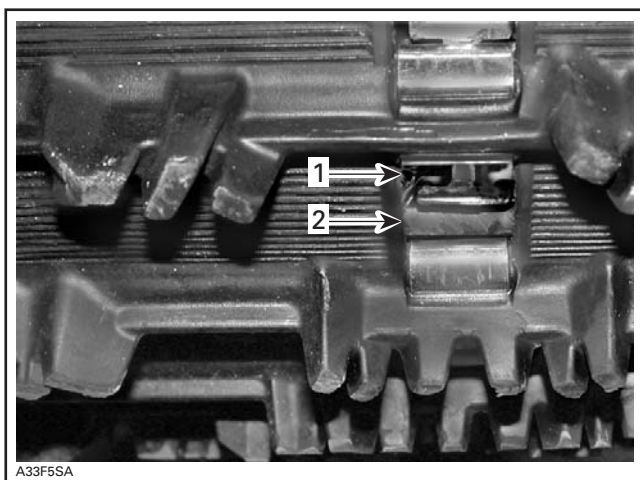
1. Lift rear of vehicle and support it off the ground.
2. Completely loosen track tension.
3. Remove nut and screw of each runner.



**TYPICAL - REMOVE NUT AND SCREW OF EACH RUNNER**

4. At the rear of vehicle, align a track window with slider shoe.

## Subsection XX (REAR SUSPENSION (tMOTION))



### TYPICAL

1. Track window
2. Slider shoe

5. Using a pry bar or a screwdriver, push slider shoe rearward until it comes in contact with track.



### PUSH ON SLIDER SHOE

6. Using locking pliers, pull slider shoe through track window to remove.

**NOTE:** If necessary, lubricate track window to facilitate slider shoe removal.



### PULL ON SLIDER SHOE TO REMOVE

## Slider Shoe Installation

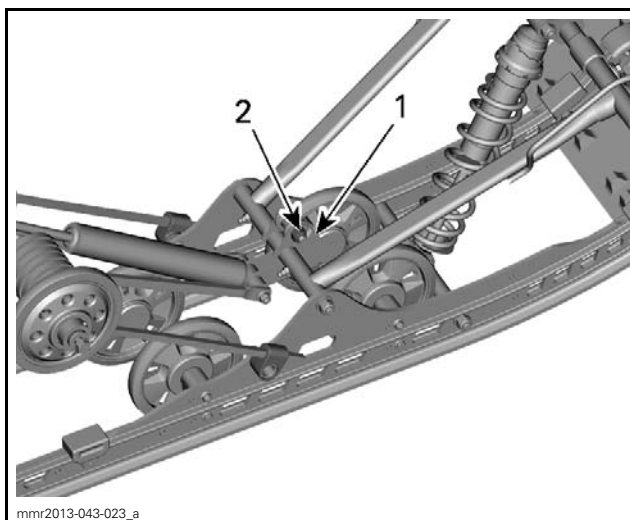
Installation is the reverse of removal procedure. Pay attention to the following detail.

Make sure to insert slider shoe end with hole first.

## FRONT ARM

### Front Arm Removal

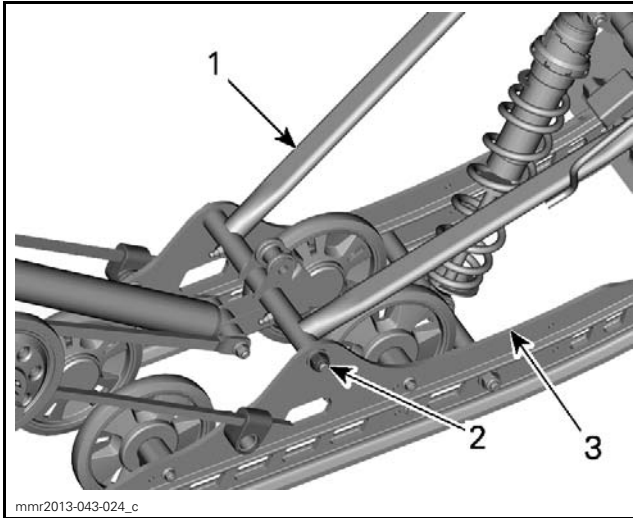
1. Proceed with *SUSPENSION ASSEMBLY REMOVAL*, see procedure in this subsection.
2. Remove the bolt securing rocker to front arm.



### TYPICAL

1. Rocker
2. Retaining screw

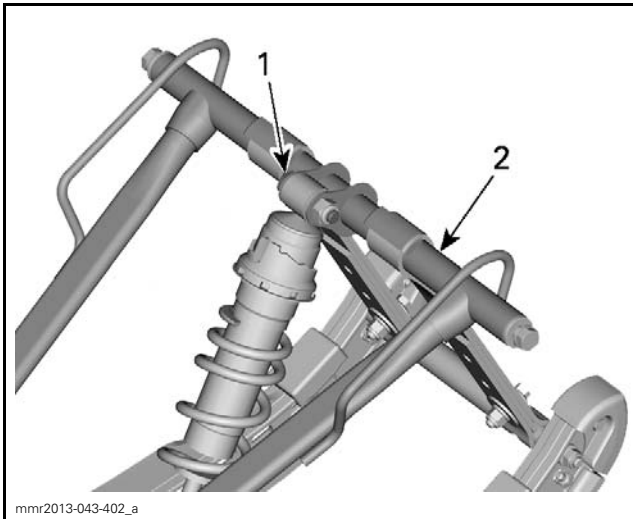
3. Remove the front arm lower bolt, nut and washers. Discard retaining nut.



**TYPICAL**

- 1. Front arm
- 2. Lower bolt
- 3. RH runner

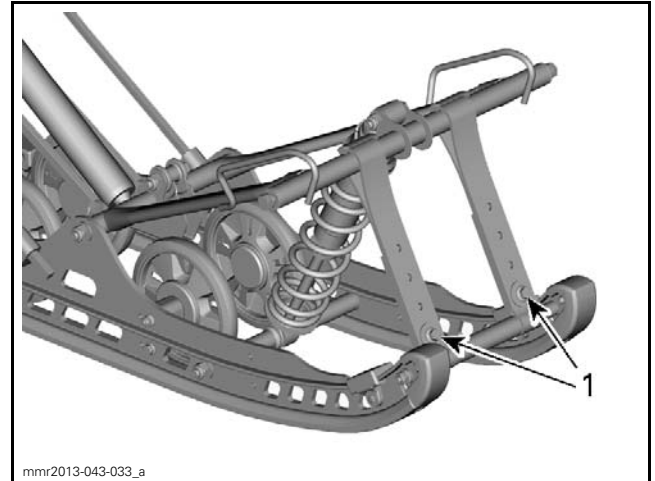
4. Remove the shock absorber upper bolt.



**TYPICAL**

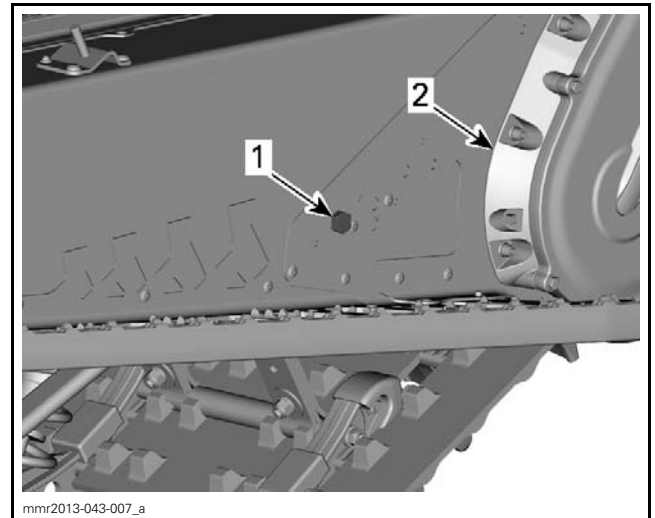
- 1. Shock absorber upper bolt
- 2. Front arm

5. Unfasten stopper straps.



- 1. Stopper strap bolts

6. Remove and discard front arm upper bolts.



**TYPICAL**

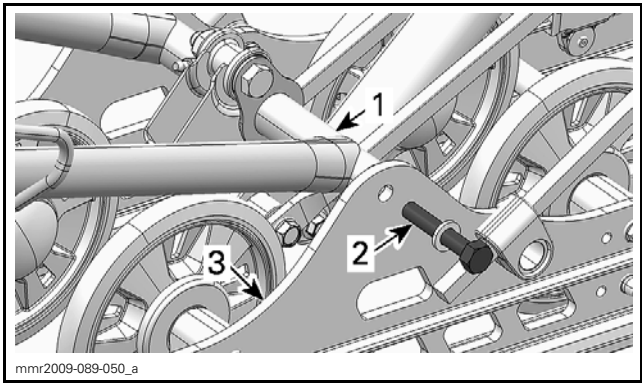
- 1. Front arm bolt
- 2. Chaincase

7. Remove front arm.

## Front Arm Installation

Installation is the reverse of removal procedure. Pay attention to the following.

- 1. Install **NEW** front arm lower nuts.
- 2. Install **NEW** front arm upper bolts.



- 1. Front arm
- 2. Front arm lower bolt (LH side)
- 3. Runner

3. Tighten screws to the specified torque.

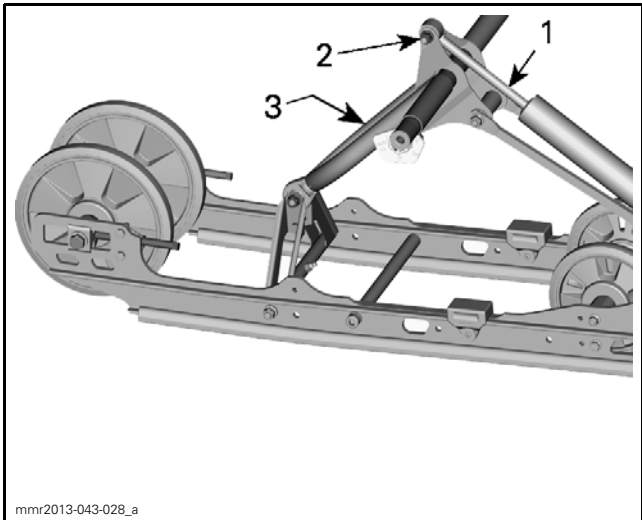
FRONT ARM LOWER FASTENERS TIGHTENING TORQUE
70 N•m (52 lbf•ft)

FRONT ARM UPPER FASTENERS TIGHTENING TORQUE
48 N•m (35 lbf•ft)

REAR ARM

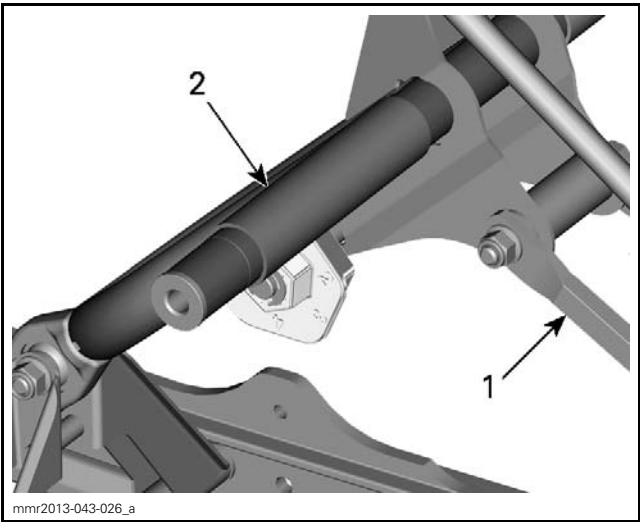
Rear Arm Removal

- 1. Lift rear of vehicle and support it off the ground.
- 2. Completely loosen track tension.
- 3. Proceed with *REAR SPRING REMOVAL*, see procedure in this section.
- 4. Remove the rear shock absorber upper bolt and discard nut.



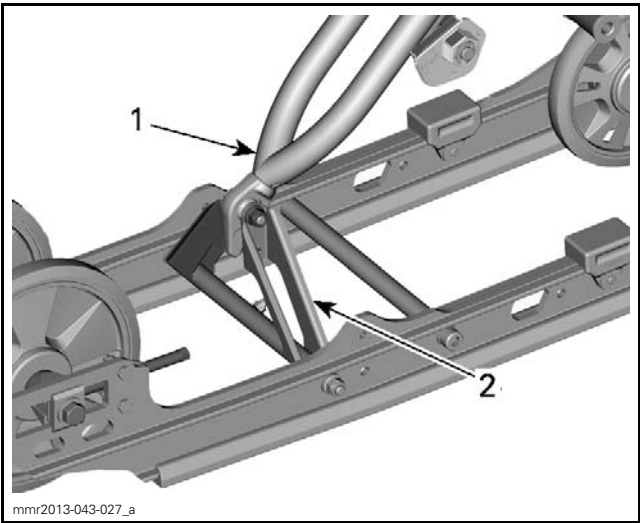
- 1. Rear shock absorber
- 2. Shock absorber bolt
- 3. Rear arm

5. Remove throttle rods from rear arm.

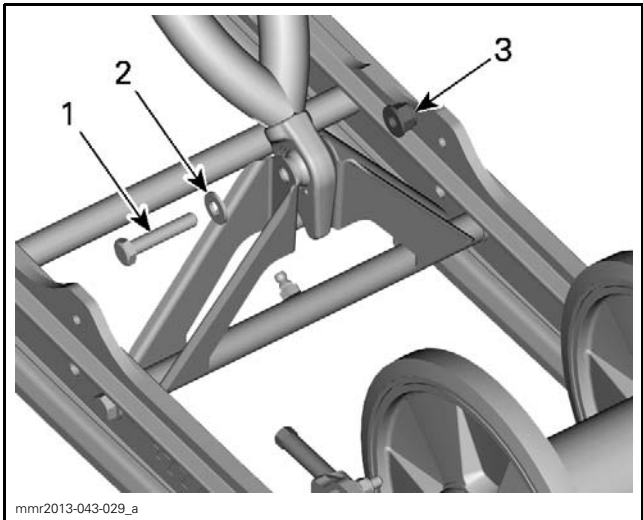


- 1. Throttle rods (1 not illustrated)
- 2. Rear arm

6. Remove bolt, nut and washer holding rear arm to pivot arm. Discard nut.



- 1. Rear arm
- 2. Pivot arm



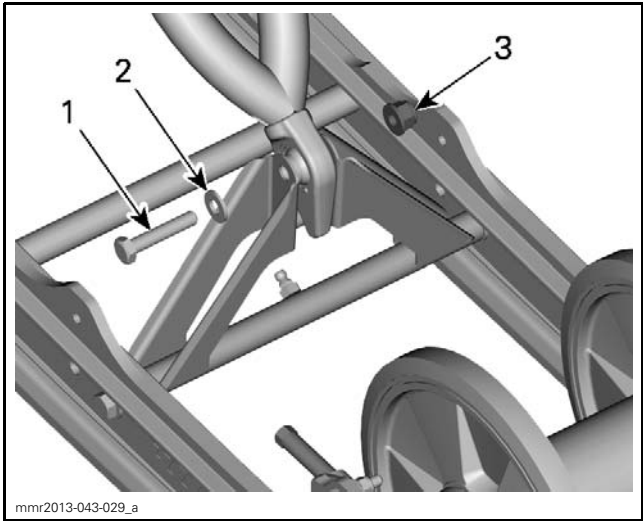
1. Retaining bolt  
2. Washer  
3. Retaining nut

### Rear Arm Installation

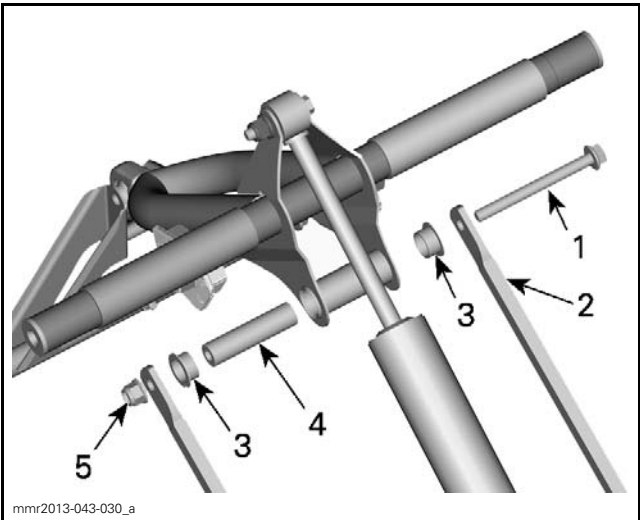
Installation is the reverse of removal procedure. Pay attention to the following.

1. Pivot arm grease fitting must be towards the front of the vehicle.
2. At installation, rear arm stroke limiter must be at rear.
3. Install **NEW** nuts and tighten to the specified torque.

Assemble rear arm fasteners as per following illustrations.



1. Retaining bolt  
2. Washer  
3. Retaining nut



**SOME PARTS REMOVED FOR CLARITY PURPOSES**

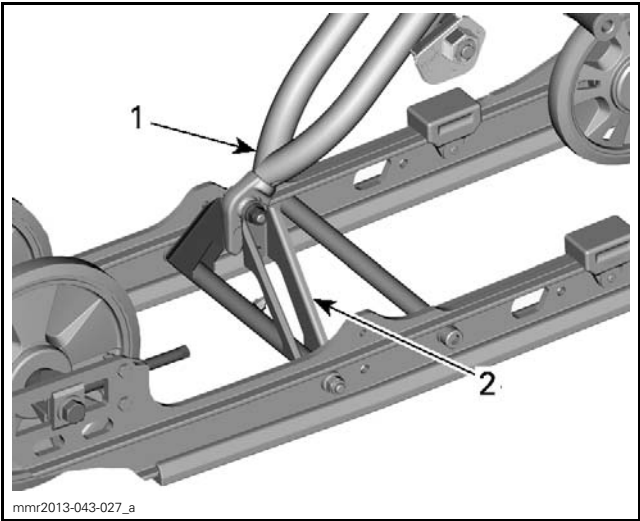
1. Throttle rod upper bolt  
2. Throttle rods  
3. Bushings  
4. Axle  
5. Throttle rod upper nut

REAR ARM FASTENERS TIGHTENING TORQUE	
Rear shock absorber upper nut	25 N•m (18 lbf•ft)
Throttle rods upper nut	25 N•m (18 lbf•ft)
Pivot to rear arm nut	25 N•m (18 lbf•ft)

### PIVOT ARM

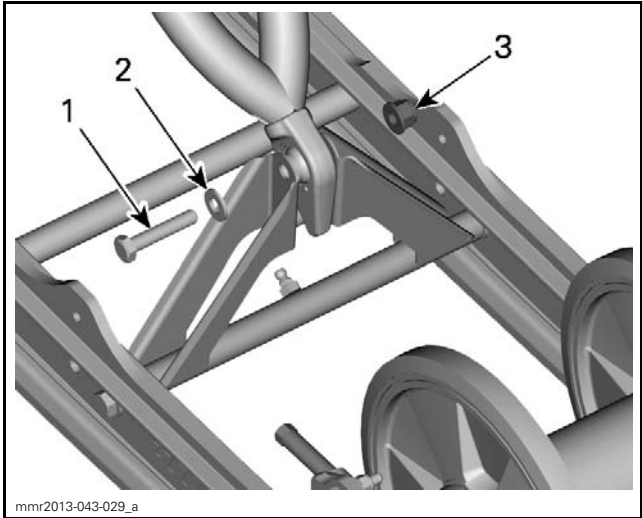
#### Pivot Arm Removal

1. Lift rear of vehicle and support it off the ground.
2. Completely loosen track tension by unscrewing both adjustment screws.
3. Remove bolt and washers retaining rear arm to pivot arm. Discard nut.



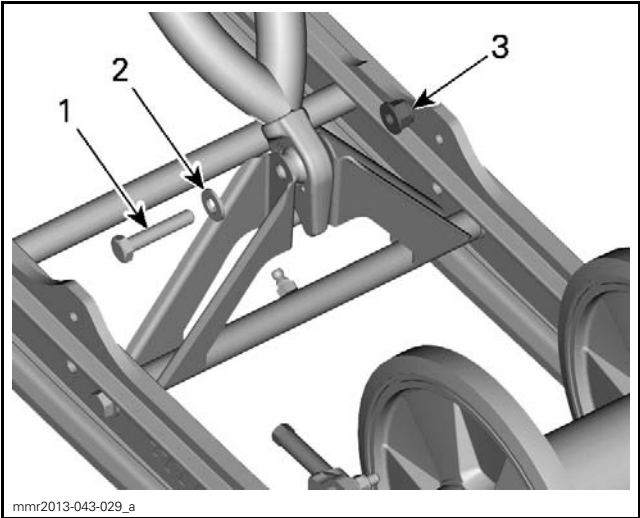
1. Rear arm  
2. Pivot arm

Subsection XX (REAR SUSPENSION (tMOTION))

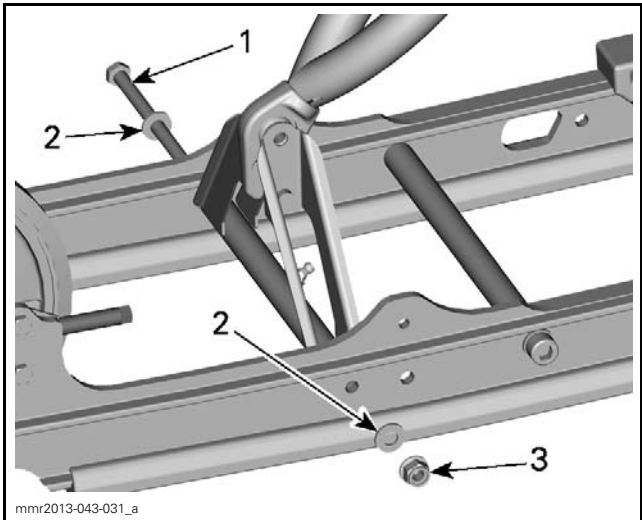


- 1. Retaining bolt
- 2. Washer
- 3. Retaining nut

4. Remove bolt, nut and 4 washers retaining pivot arm to runners.



- 1. Retaining bolt
- 2. Washer
- 3. Retaining nut



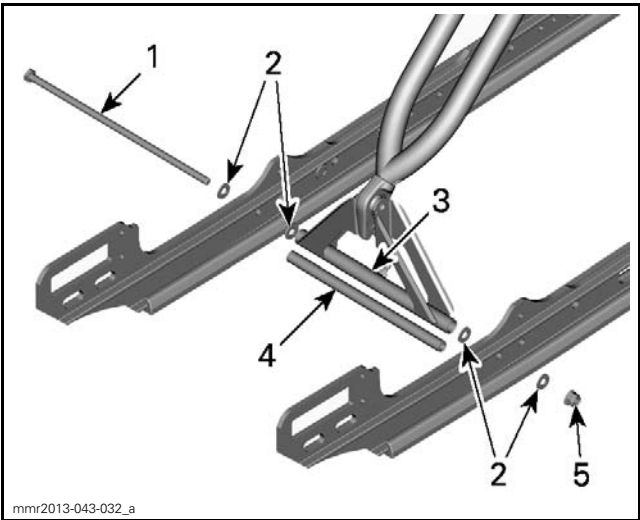
- 1. Retaining bolt
- 2. Outer washers
- 3. Retaining nut

**NOTE:** Make sure inner washers are properly removed from assembly to avoid losing them

5. Carefully remove pivot arm from rear arm.

Pivot Arm Installation

The installation is the reverse of the removal procedure. However, pay attention to the following. Assemble pivot arm fastener as per following illustrations.



PARTS REMOVED FOR CLARITY PURPOSE

- 1. Pivot arm lower nut
- 2. Washers
- 3. Pivot arm
- 4. Axle
- 5. Pivot arm lower screw

Torque pivot arm lower nut to 25 N•m (18 lbf•ft). Lubricate pivot arm. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

IDLER WHEELS AND SUPPORTS

Refer to the exploded views at the beginning of this subsection for parts layout and fasteners tightening torque.

STOPPER STRAP

Refer to the exploded views at the beginning of this subsection for parts layout and fasteners tightening torque.