

REAR SUSPENSION (tMOTION)

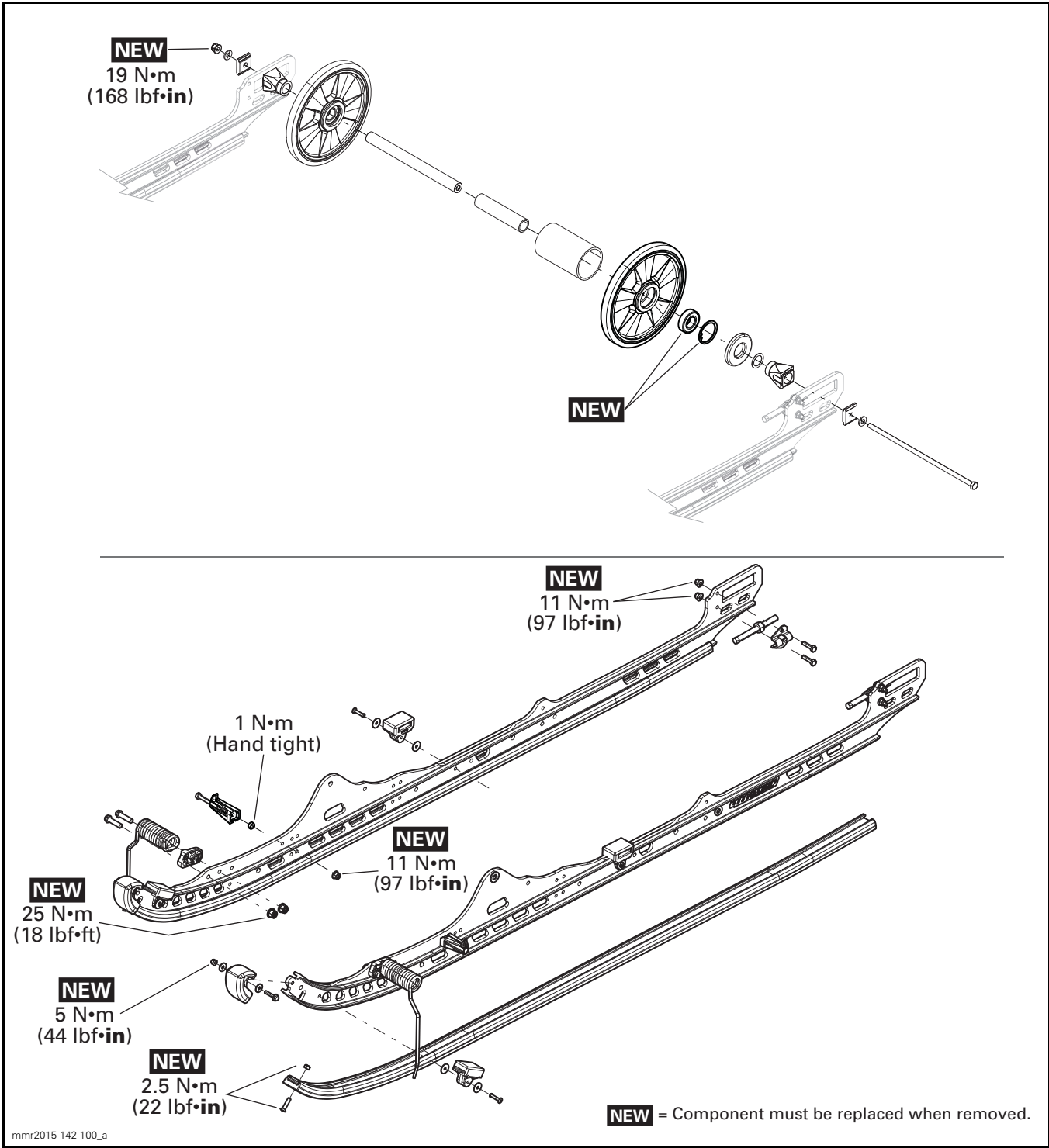
SERVICE TOOLS

Description	Part Number	Page
SHOCK ABSORBER SUPPORTS	529 036 186	14

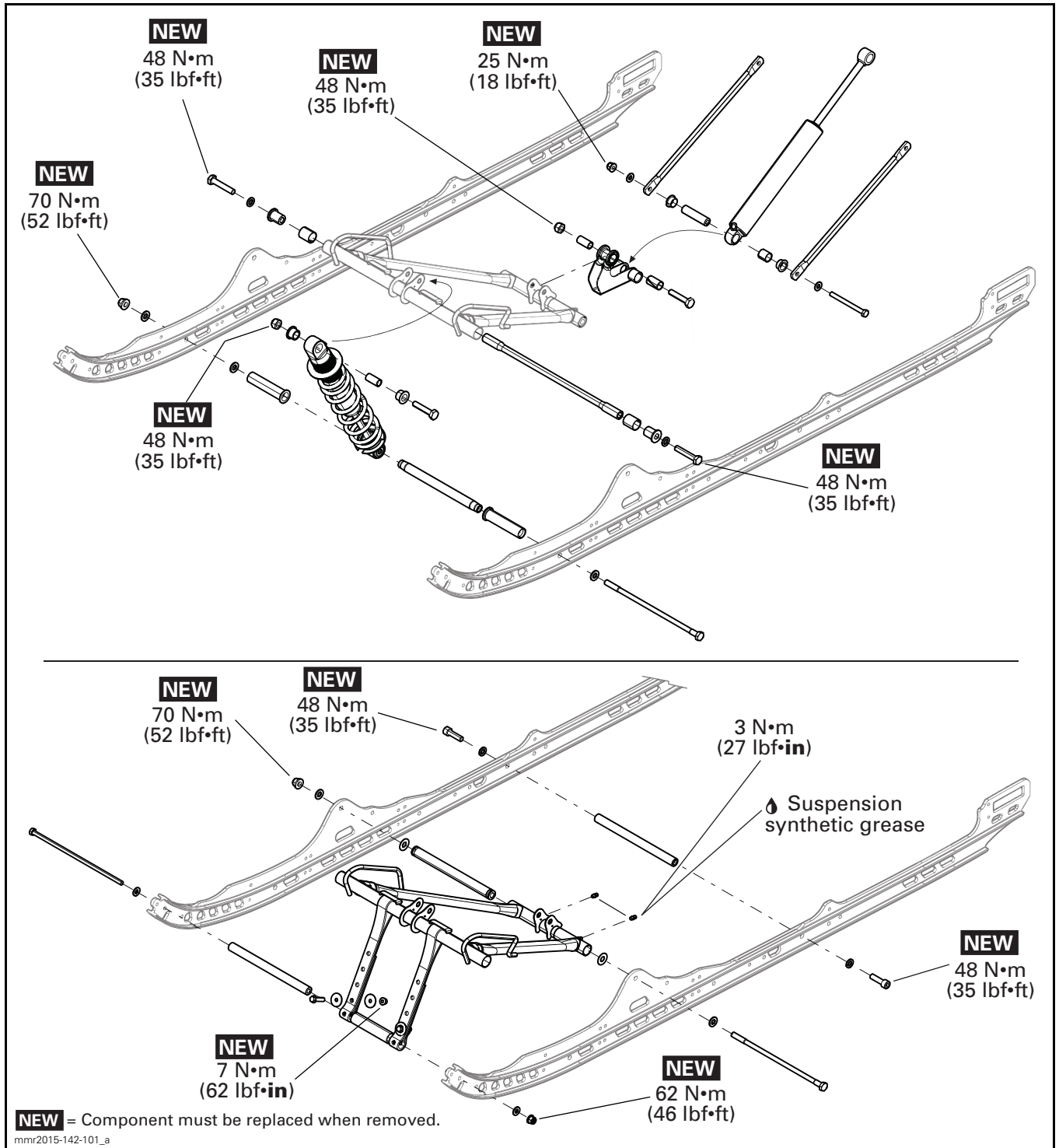
SERVICE TOOLS – OTHER SUPPLIER

Description	Part Number	Page
BENCH SCALE SUCH AS SALTER BRECKNELL	PS 400	14

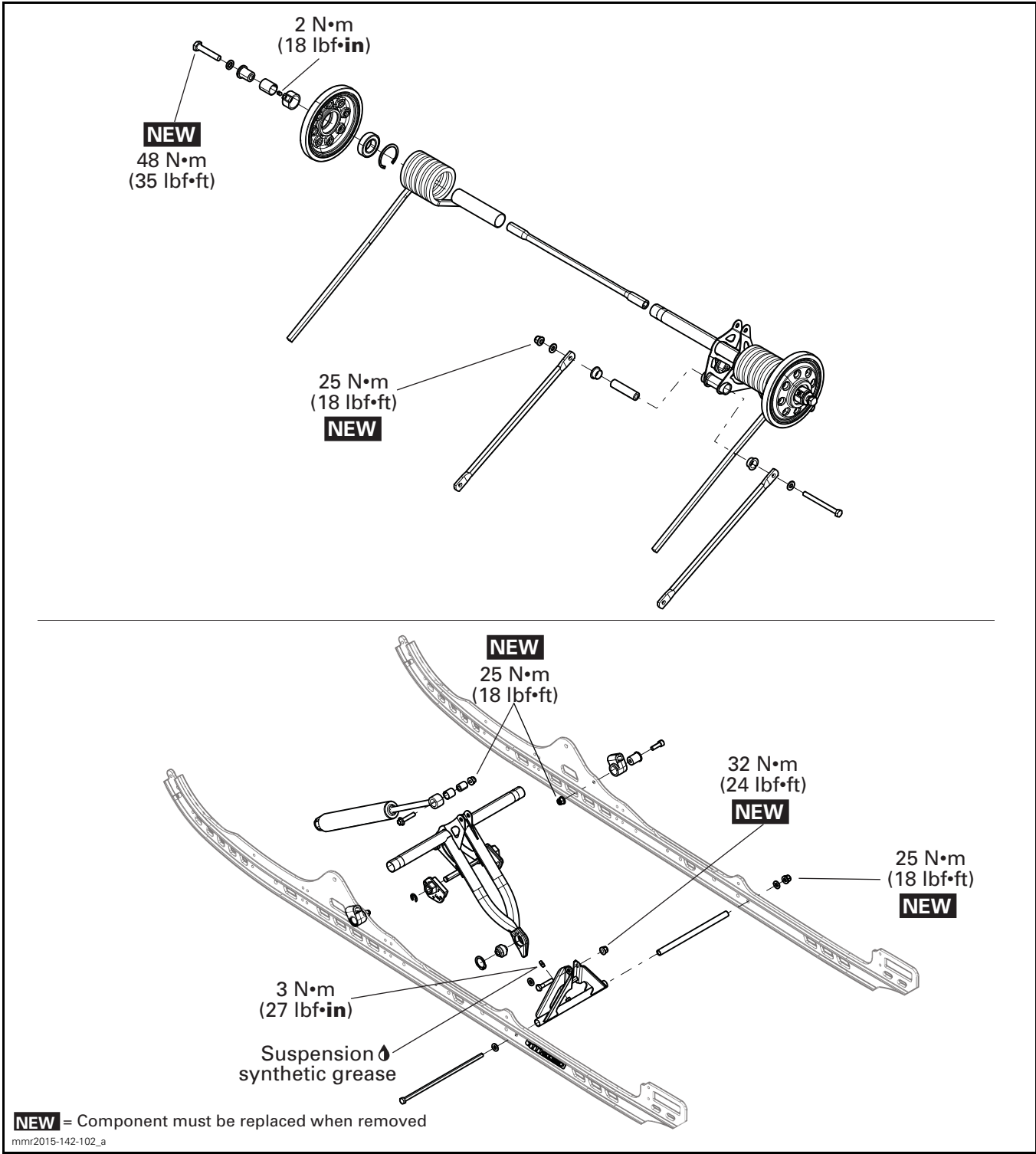
RAILS AND IDLER WHEELS



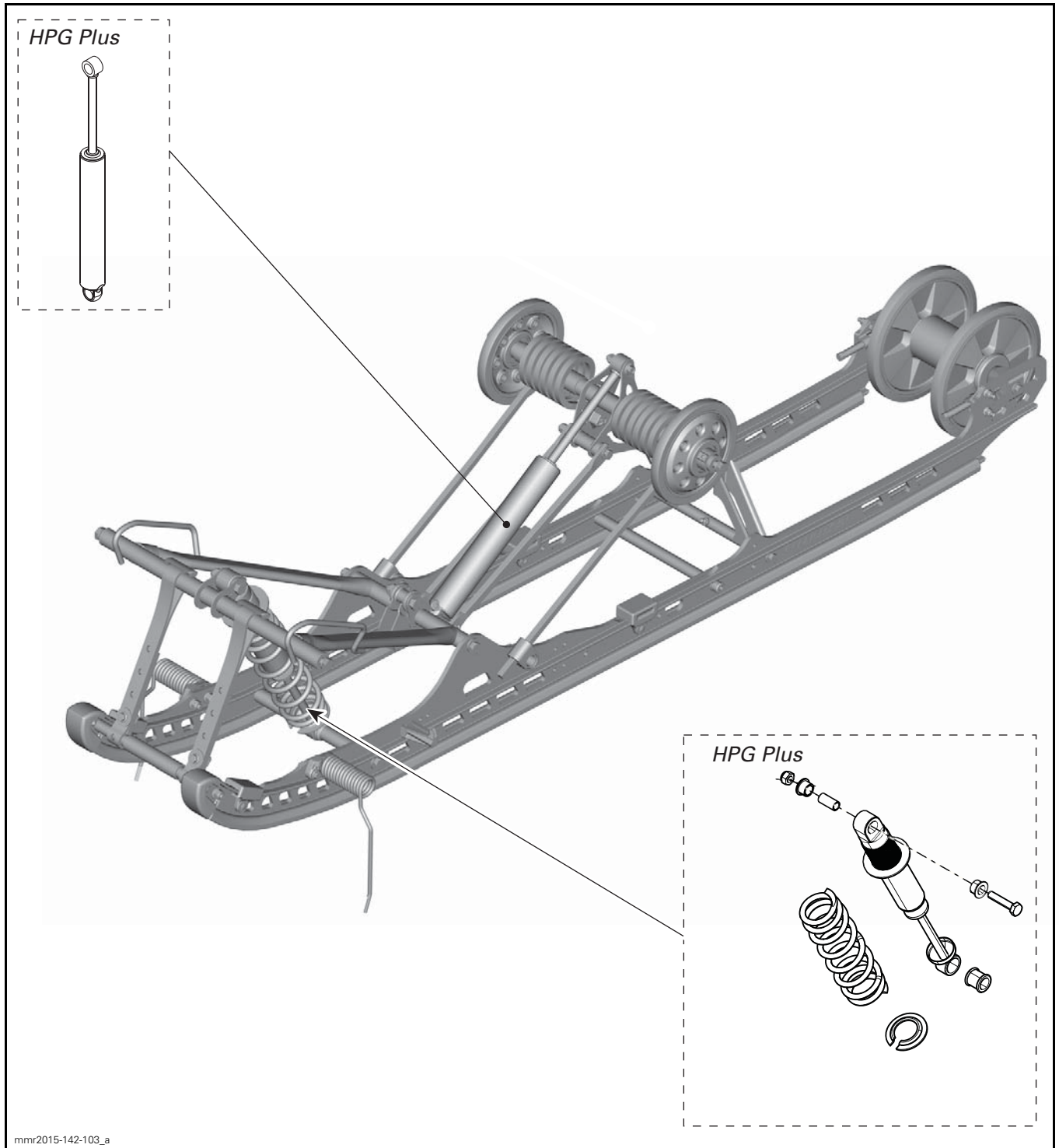
FRONT ARM



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.

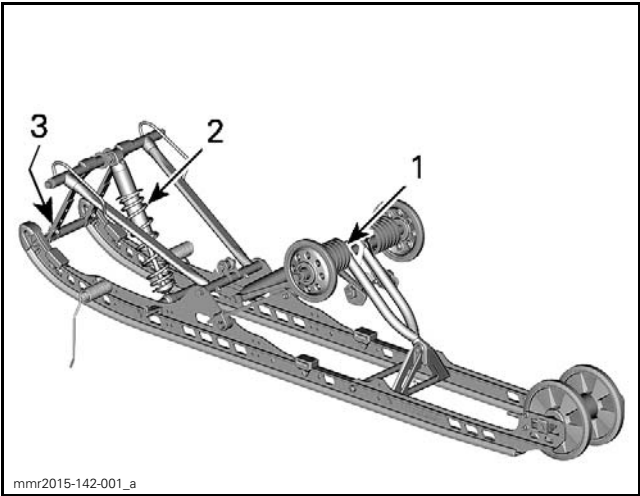
Clean threads before applying a threadlocker. Refer to *SELF-LOCKING FASTENERS* and *LOCTITE APPLICATION* at the beginning of this manual for complete procedure.

 **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



- ADJUSTABLE COMPONENTS
- 1. Rear springs
 - 2. Center spring
 - 3. Stopper strap

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

Stopper Strap

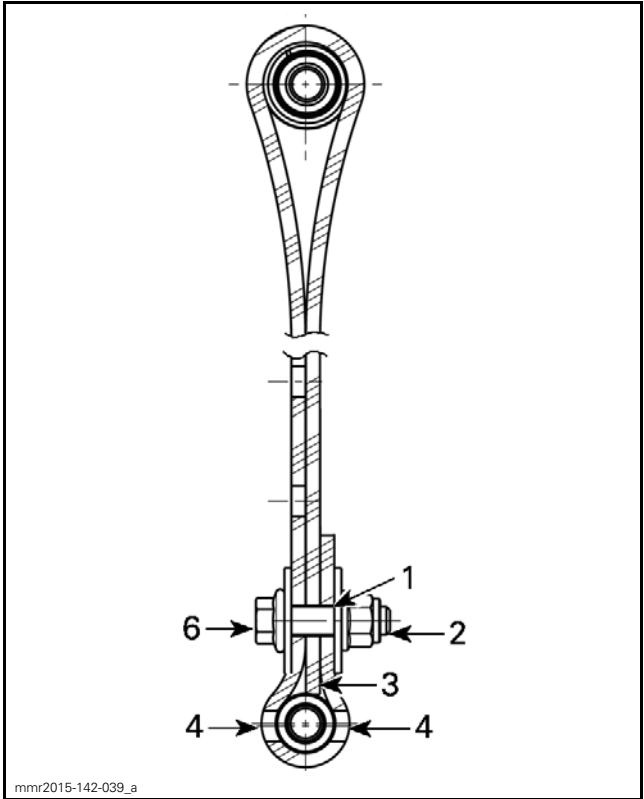
Stopper strap length has an effect on the amount of weight the center spring has to carry especially during acceleration, therefore on the front end up-lift.

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

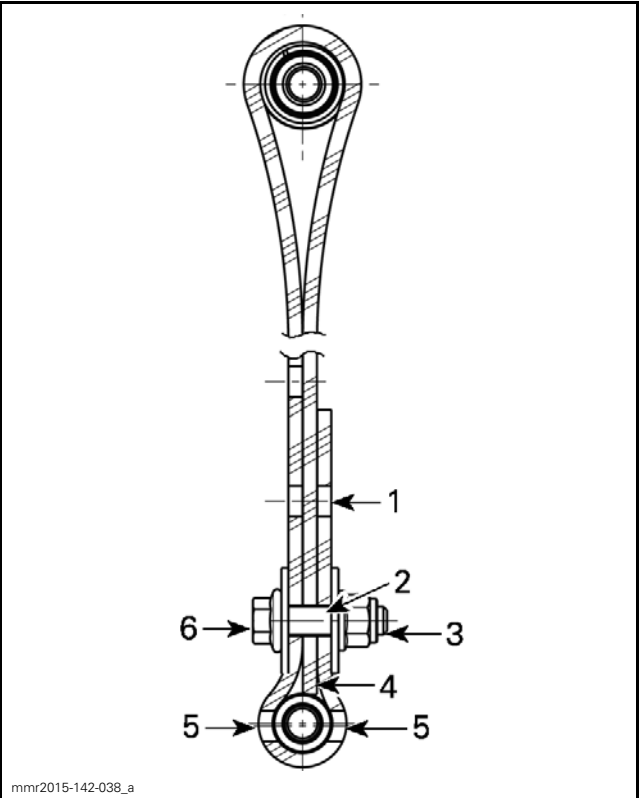
NOTICE Whenever stopper strap length is changed, track tension must be checked.

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

NOTE: Stopper strap could be set to position 1, 2, 3, 4 and 5. Below are illustrations for position 1, 2, 3. Smaller numbers correspond to a longer strap setting.

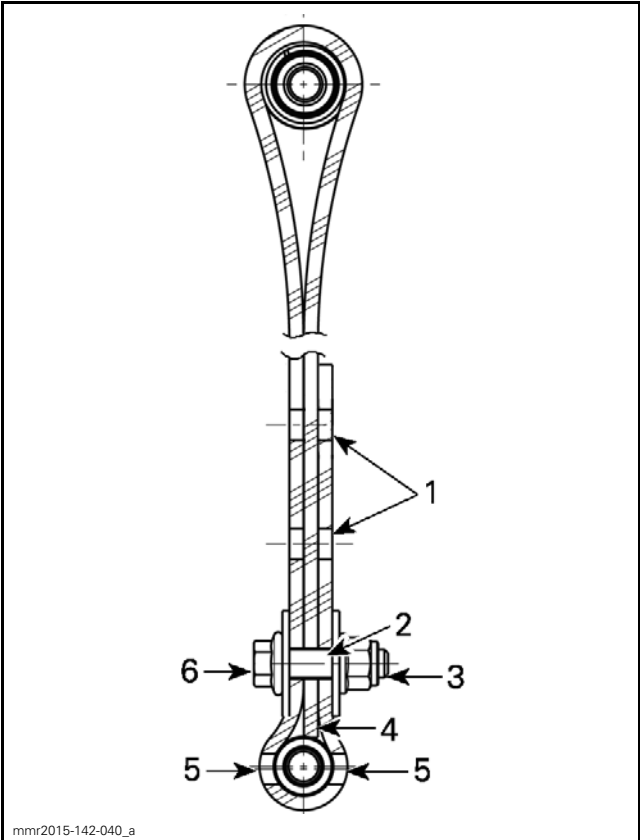


- STOPPER STRAP POSITION 1 (1ST HOLE, LONGEST)
- 1. 1st hole from end
 - 2. Towards rear
 - 3. Tip of strap touching strap axis
 - 4. Two holes left open between screw head and nut
 - 5. Towards front



STOPPER STRAP POSITION 2 (2ND HOLE)

- 1. Free hole
- 2. 2nd hole from end
- 3. Towards rear
- 4. Tip of strap touching strap axis
- 5. Two holes left open between screw head and nut
- 6. Towards front



STOPPER STRAP POSITION 3 (3RD HOLE)

- 1. Free holes
- 2. 3rd hole from end
- 3. Towards rear
- 4. Tip of strap touching strap axis
- 5. Two holes left open between screw head and nut
- 6. Towards front

NOTE: 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 on a flat landscape and a shorter setting will improve handling in steep hill climbing and deep snow conditions.

STOPPER STRAP SETTING	
POSITION	USE
1	Not used
2	Boon docking: <ul style="list-style-type: none">– Better boon docking manoeuvrability– Better bump absorption– Better deep snow starts (forward and reverse)

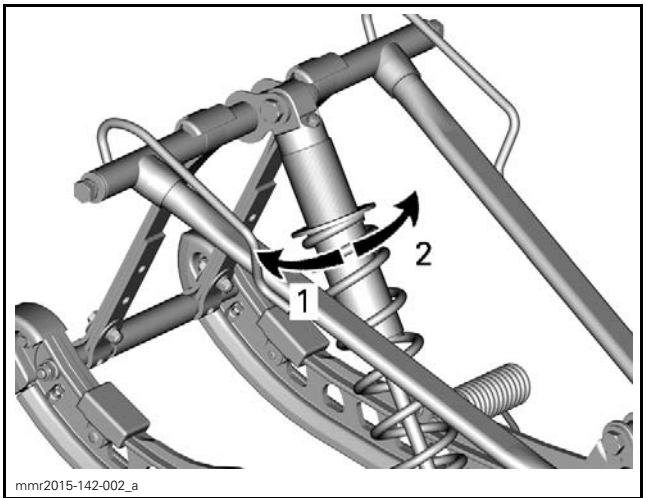
STOPPER STRAP SETTING	
POSITION	USE
3	Factory setting: Best overall setting (General use)
4	Hill climb: – Better track attack angle for hill climbing
5	Steep hill climb: – Better track attack angle for hill climbing – Less transfer – Lower ride height

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



- 1. Decrease preload
- 2. Increase preload

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

Rear Springs

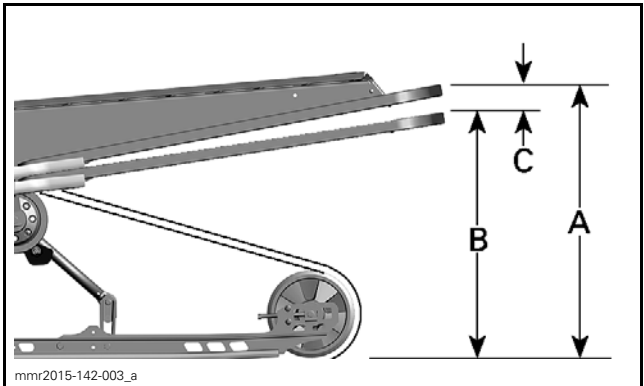
Rear spring preload has an effect on comfort, ride height and load compensation.

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.



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

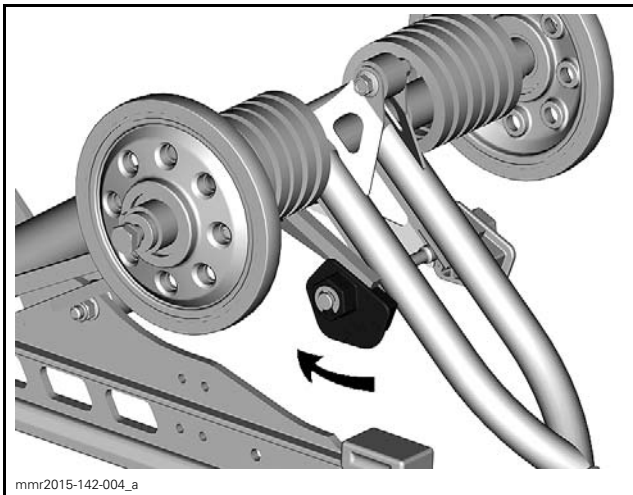
"C"	WHAT TO DO
65 mm to 100 mm (2.5 in to 4 in)	No adjustment required
More than 100 mm (4 in)	Adjusted too soft. Increase preload
Less than 65 mm (2.5 in)	Adjusted too firm. Decrease preload

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.



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.

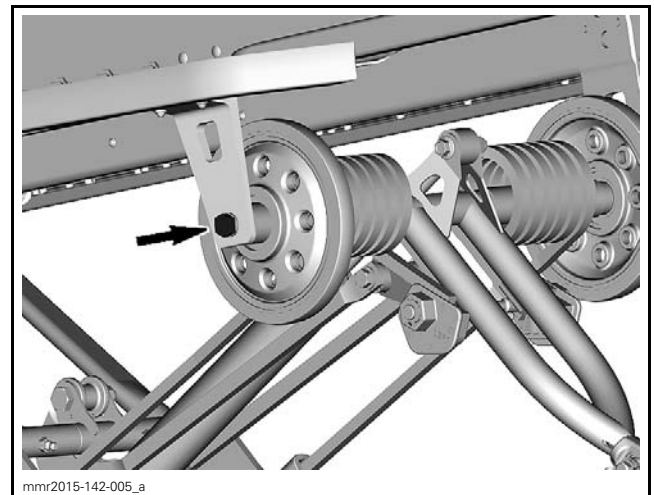
PROCEDURES

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

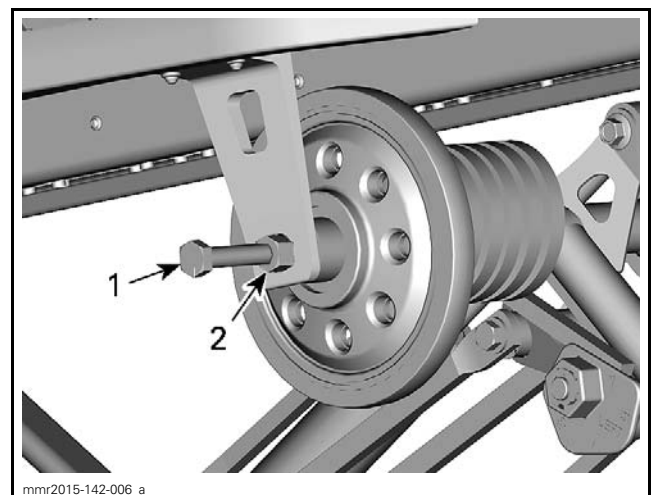
SUSPENSION ASSEMBLY

Suspension Assembly Removal

1. Lift rear of vehicle and support it off the ground.
2. Completely loosen track tension.
3. Remove and discard rear arm bolts from chassis. Use the following procedure to remove bolts easily.
 - 3.1 Remove one of the bolts securing the rear arm to frame.



- 3.2 Replace this bolt with a longer one and a nut.
- 3.3 Screw in by approximately 7 turns.
- 3.4 Hold the bolt and tighten locking nut.

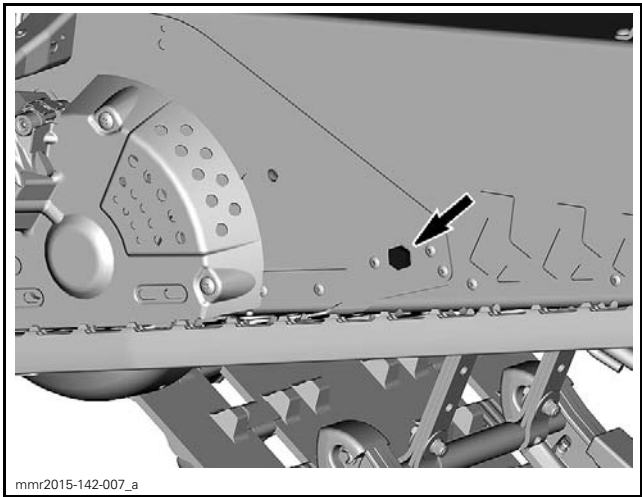


1. Long bolt
2. Locking nut

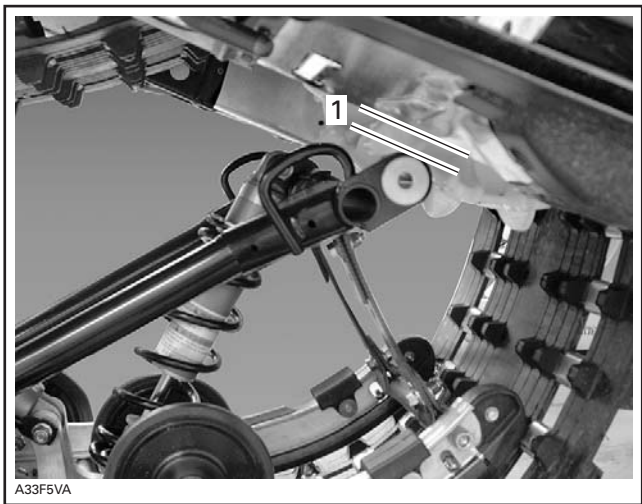
- 3.5 Remove the bolt on the other side then unlock nut and remove the long bolt.

4. Remove bolts retaining front arm to tunnel.

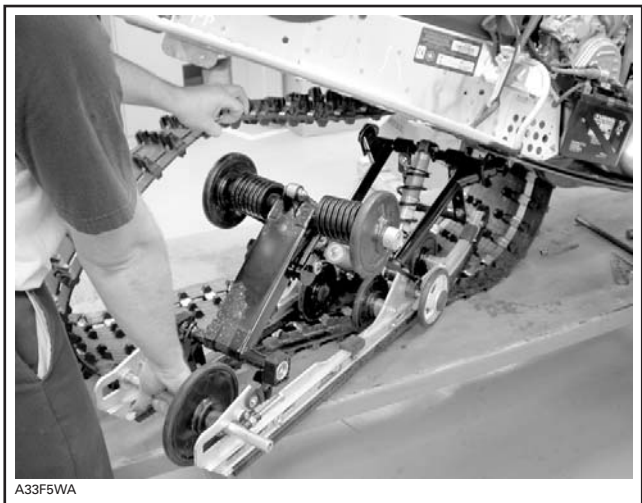
NOTE: Discard the front arm bolts.



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 and rear arm nuts.

Tighten screws to specified torque.

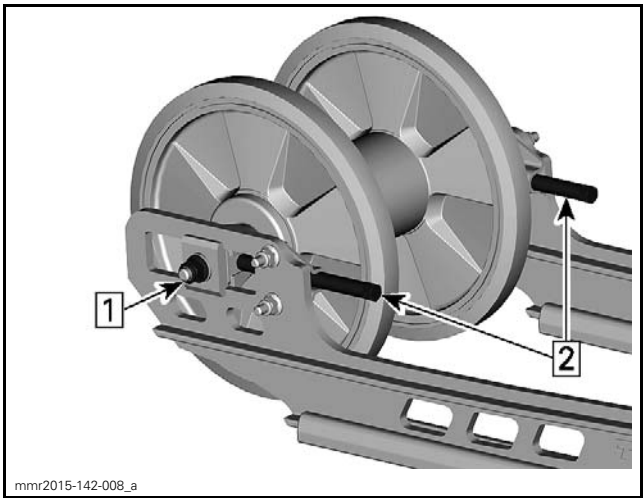
TIGHTENING TORQUE	
Front and rear arm upper bolts	48 N•m (35 lbf•ft)

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 nut.
3. Completely loosen track tension by unscrewing both adjustment screws.



Step 1: Loosen axle nut
Step 2: Unscrew adjustment screws

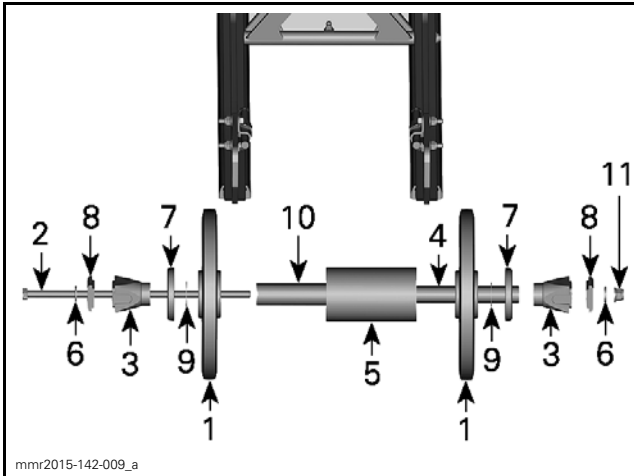
4. Remove rear axle screw, conical washers, sliders and nut.
5. Pull out the rear axle.
6. Remove all parts between runners.

Rear Axle Installation

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

1. Make sure to position all parts correctly.
 - Bearing circlip in wheels facing outwards
 - Conical washers with concave side towards inside.

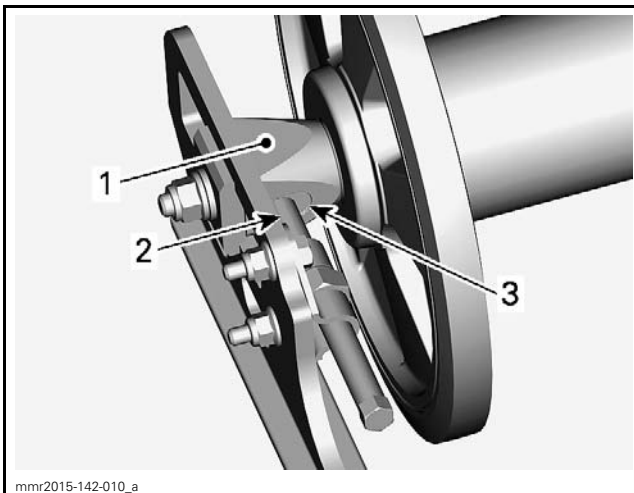
NOTE: When installing conical washers, concave side must be towards inside.



2 IDLER WHEELS LAYOUT

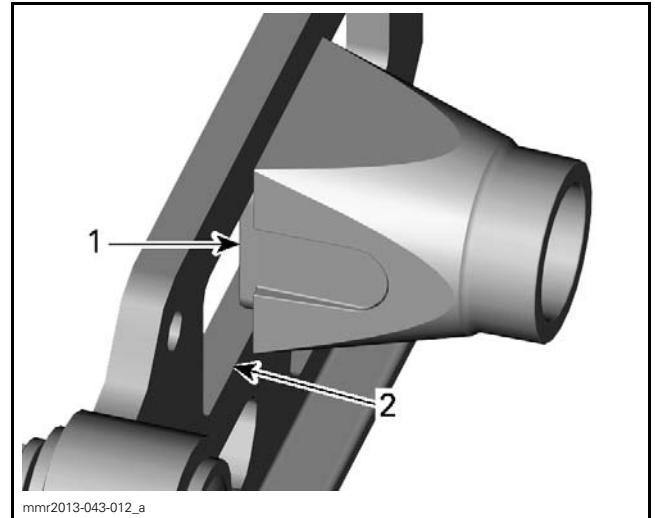
1. Idler wheels
2. Axle screw
3. Rear wheels outer spacer
4. Rear axle
5. Rear wheels inner spacer
6. Conical washers
7. Seals
8. Slider
9. Washers
10. Rear wheels axle spacer
11. Rear axle nut

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. groove for tensioner screw

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



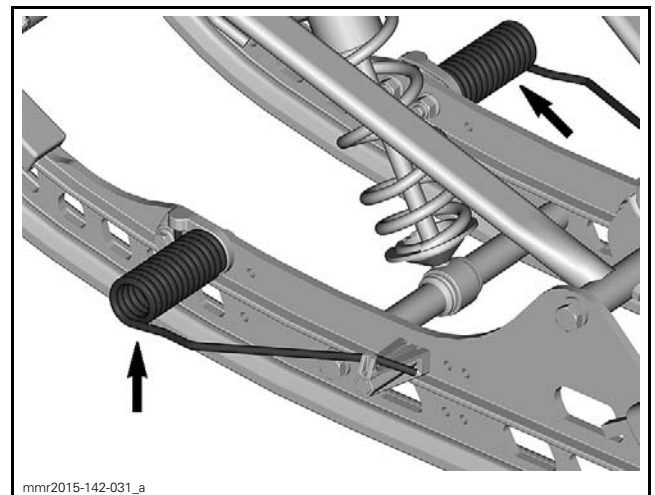
1. Wheel spacer protuberance
2. Runner slot

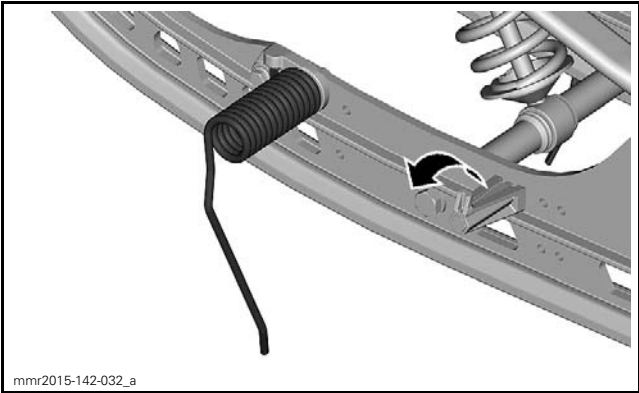
3. Adjust track tension. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

ICE SCRATCHERS

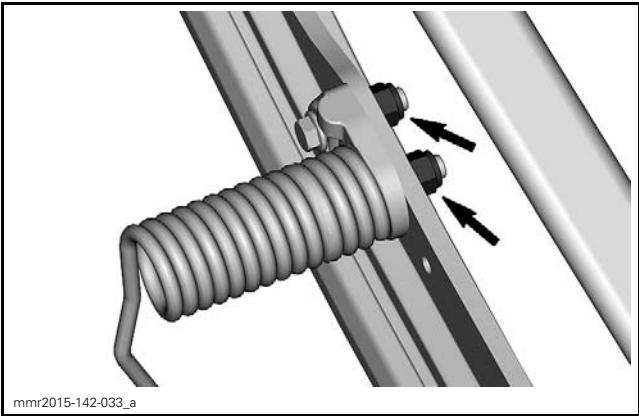
Ice Scratcher Removal

⚠ CAUTION Always remove ice scratchers from hooks before working on rear suspension.



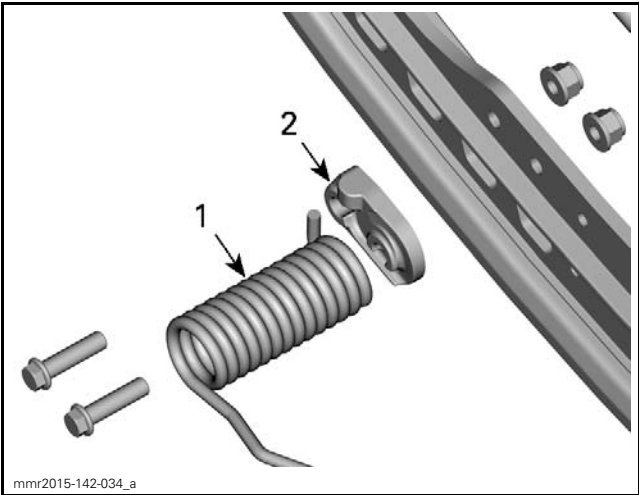


Remove spring holder nuts.



Ice Scratcher Installation

The installation is the reverse of the removal procedure. However, pay attention to the following. Make sure spring end is well inserted in holder.



1. Ice scraper spring
2. Spring holder

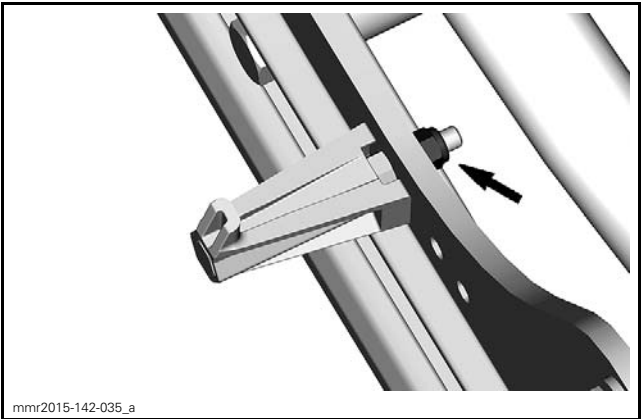
Tighten retaining nuts to specification.

TIGHTENING TORQUE	
Spring retaining nuts	25 N•m (18 lbf•ft)

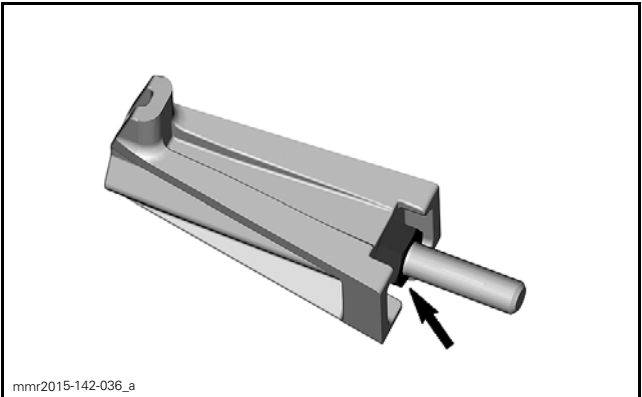
Ice Scratcher Hook Removal

CAUTION Always remove ice scratchers from hooks before working on rear suspension.

1. Remove hook retaining nut.

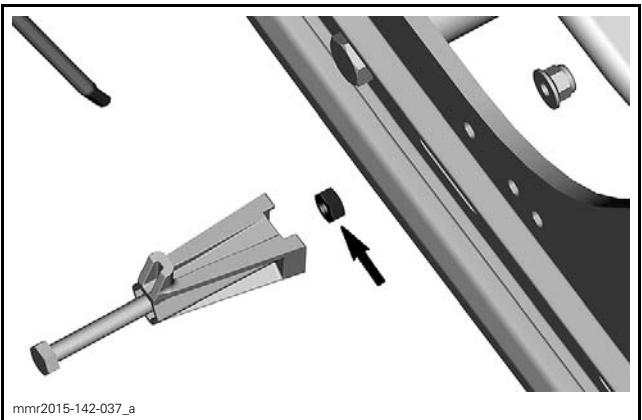


2. Remove hook counter nut.



Ice Scratcher Hook Installation

The installation is the reverse of the removal procedure. However, pay attention to the following. Hand tighten counter nut first.



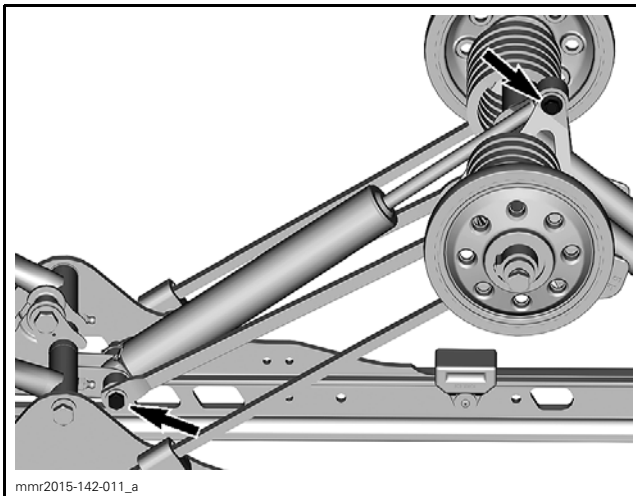
Tighten hook retaining nut to specification.

TIGHTENING TORQUE	
Hook retaining nut	11 N•m (97 lbf•in)

SHOCK ABSORBERS

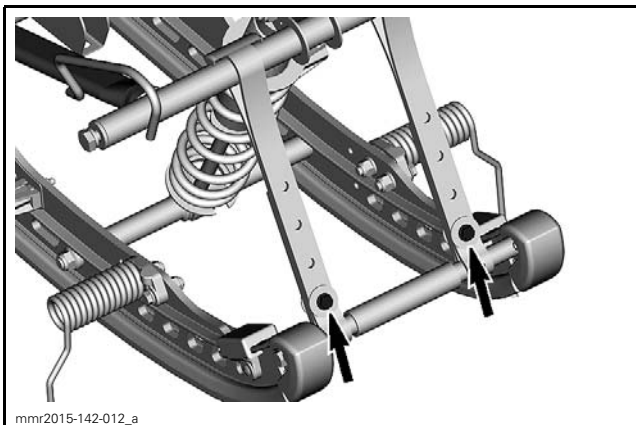
Rear Shock Absorber Removal

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.

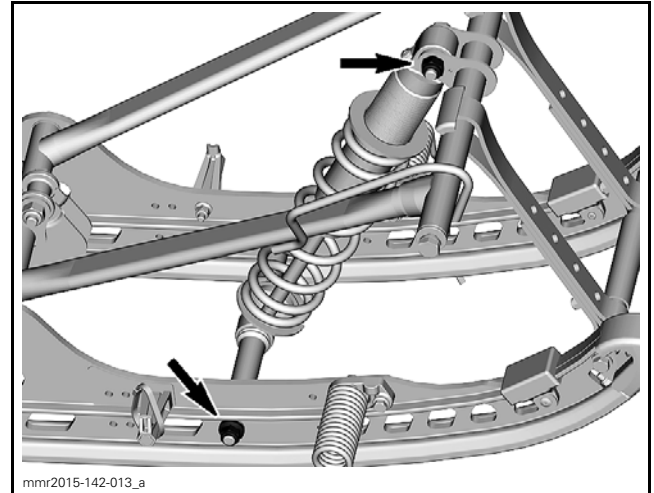


Center Shock Absorber Removal

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



3. Remove lower and upper shock absorber nuts and bolts.



4. Remove shock absorber from vehicle.
5. Remove bushings and shock shaft from shock absorber.

Shock Absorber Inspection

NOTE: Unless otherwise noted, shock absorber must be at normal room temperature ($21^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ($70^{\circ}\text{F} \pm 36^{\circ}\text{F}$)) during inspection.

1. Perform a visual inspection of the shock:
 - The shock must be exempt of any dent or scratch, especially on the rod.
 - Any defect on the rod, as small as it is, can lead to seal failure and oil leak.
 - If such defect is detected, the shock must be replaced and this will not be covered under warranty.
2. Completely push down shock rod into the body and check result as per table.

HPG SHOCK	RESULT
All except 551 mm (21-11/16 in) rear shock	The rod should completely get in the shock body
551 mm (21-11/16 in) rear shock	The stroke must be at least 138 mm (5-7/16 in)

3. Release shock from completely collapsed position and check result as per table.

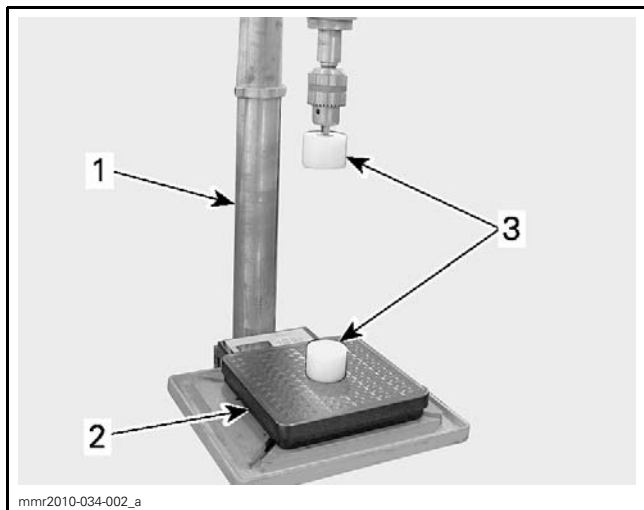
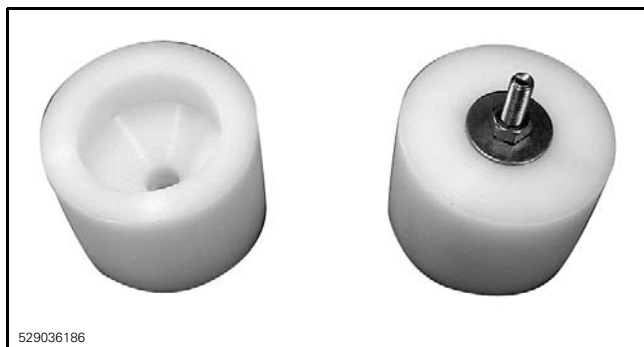
HPG SHOCK
– The shock should extend unassisted.
– The rod must come out at a steady speed.

4. Proceed with *SHOCK ABSORBER COMPRESSION TEST*. See procedure in this subsection.
5. If any faults are present, replace shock.

Subsection XX (REAR SUSPENSION (tMOTION))

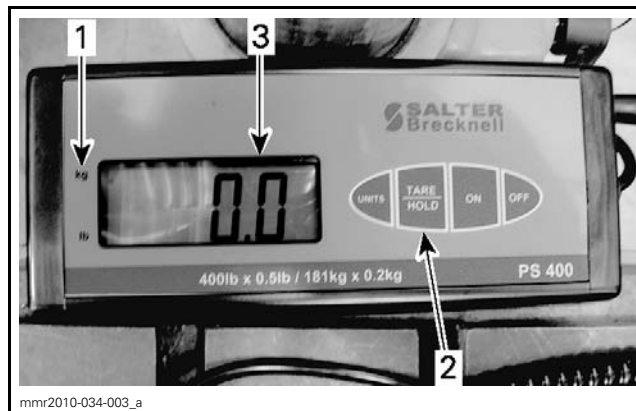
Shock Absorber Compression Test

1. Ensure shock absorber is at normal room temperature ($21^{\circ}\text{C} \pm 2^{\circ}\text{C}$ ($70^{\circ}\text{F} \pm 36^{\circ}\text{F}$)).
2. Remove spring from shock absorber (if applicable).
3. Place a BENCH SCALE SUCH AS SALTER BRECKNELL (P/N PS 400) (or an equivalent) on a suitable drill press.
4. Install SHOCK ABSORBER SUPPORTS (P/N 529 036 186) onto drill press.



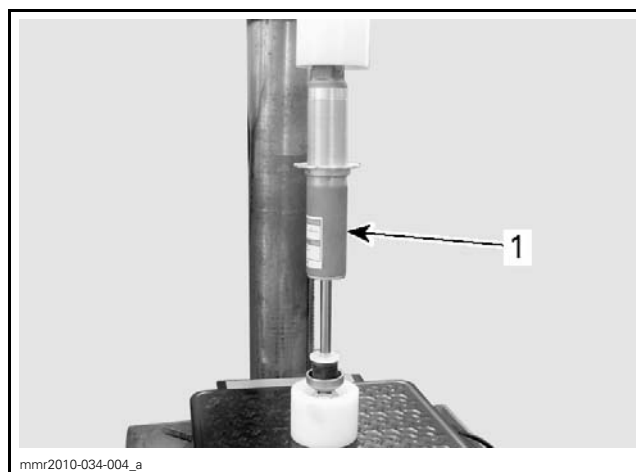
1. Drill press
2. Bench scale
3. Shock absorber supports

5. Set bench scale units to **kg** (or **lb**).
6. Press **TARE** to reset digits (must indicate (0) zero).



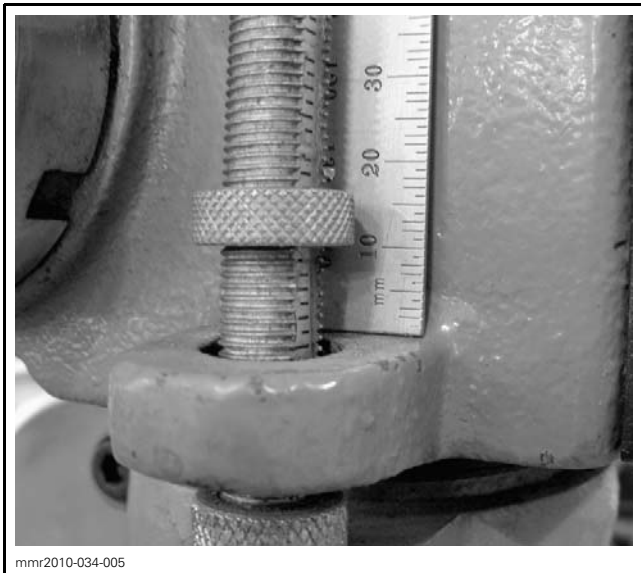
1. Units indicator lamp
2. TARE button
3. Digits

7. Install shock absorber into support with shock body upwards.
8. Adjust drill press table height in order to set the upper shock support flush with the shock body end.
9. Ensure shock absorber is aligned with drill press axis.



1. Shock body upwards

10. Set the drill press displacement to 10 mm (.394 in) using locking nut.



11. Compress shock absorber by 10 mm (.394 in) and hold it in position.
12. Read load recorded on the bench scale.



13. Load reading must be as per the following table.

ROD DIAMETER	SERVICE RANGE
12.5 mm (1/2 in)	24 kgf ± 4 kgf (53 lbf ± 9 lbf)

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.

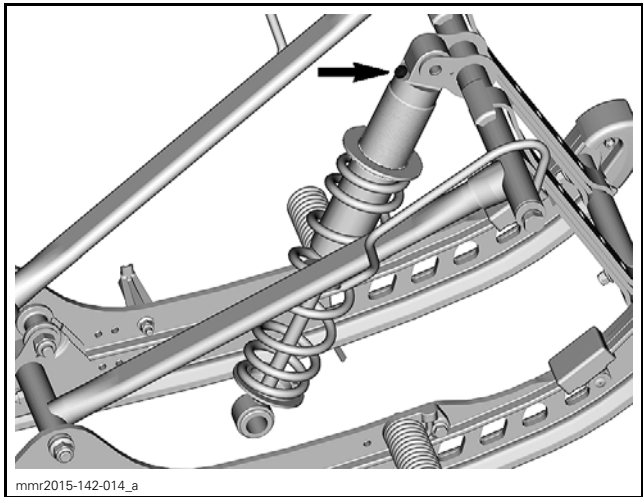
Install **NEW** shock absorber retaining nuts and tighten to specification.

TIGHTENING TORQUE	
Rear shock absorber fasteners	25 N•m (18 lbf•ft)

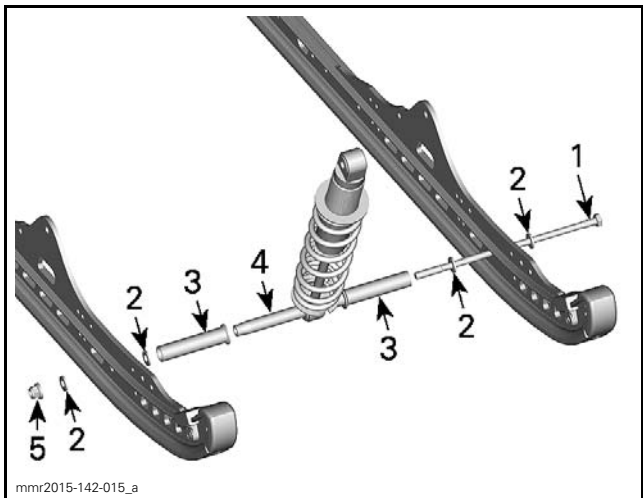
Center Shock Absorber Installation

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

1. Position the adjustment ring upwards and the valve towards the tunnel.



2. Using **NEW** nut, install shock shaft to runners.
3. Position washers in proper position.



BOTTOM OF SHOCK ABSORBER

1. Lower screw
2. Washers location
3. Spacers
4. Shock shaft
5. Nut

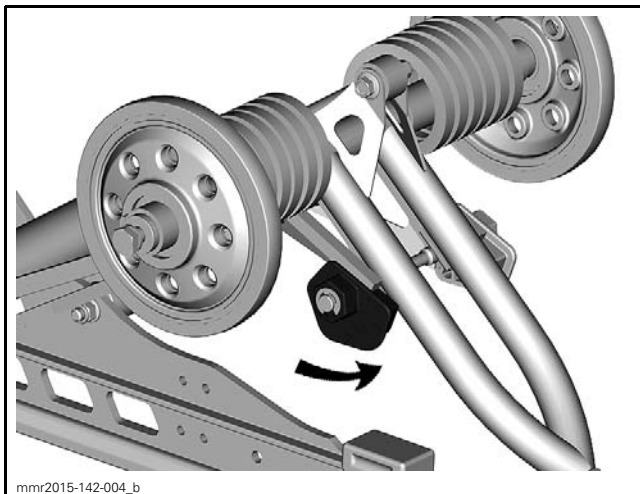
Tighten nut to the specification.

TIGHTENING TORQUE	
Center shock absorber lower nut	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.

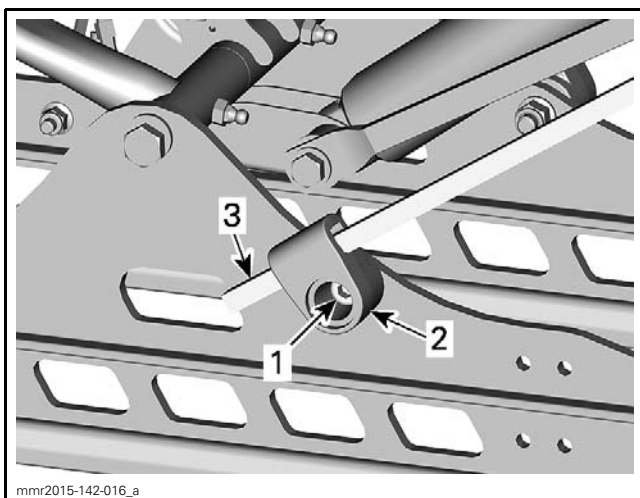


LH SIDE SHOWN

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

⚠ WARNING

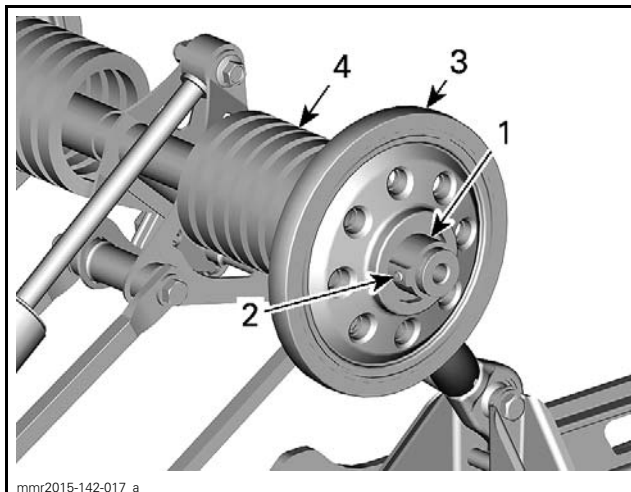
Supports are spring loaded.



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.



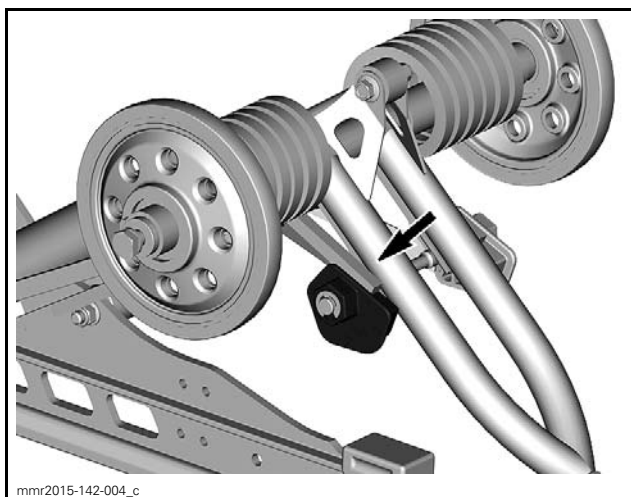
LH SIDE SHOWN

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

Rear Spring Installation

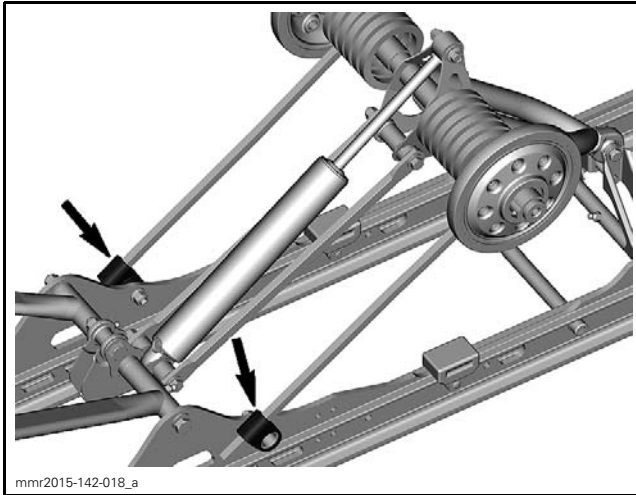
Installation is the reverse of removal procedure. Pay attention to the following.

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



LH SIDE SHOWN

3. Install spring supports upwards.



SLIDER SHOES

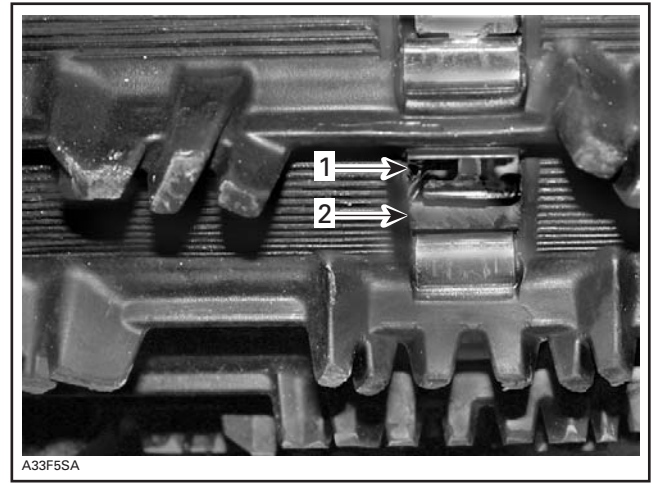
Slider Shoe Removal

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

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



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.

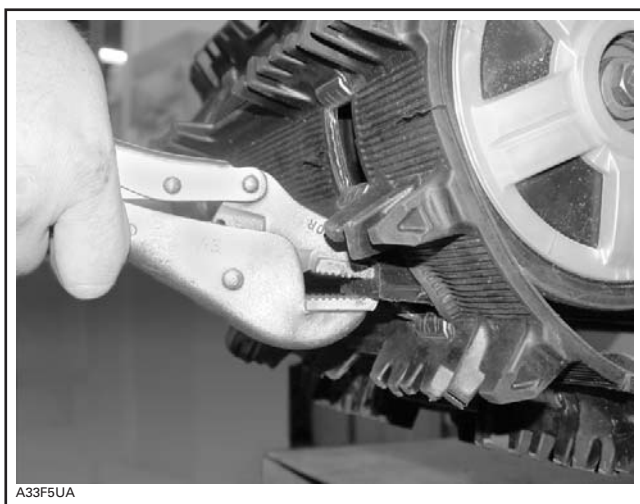


TYPICAL - PUSH ON SLIDER SHOE

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

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

Subsection XX (REAR SUSPENSION (tMOTION))



TYPICAL - PULL ON SLIDER SHOE TO REMOVE

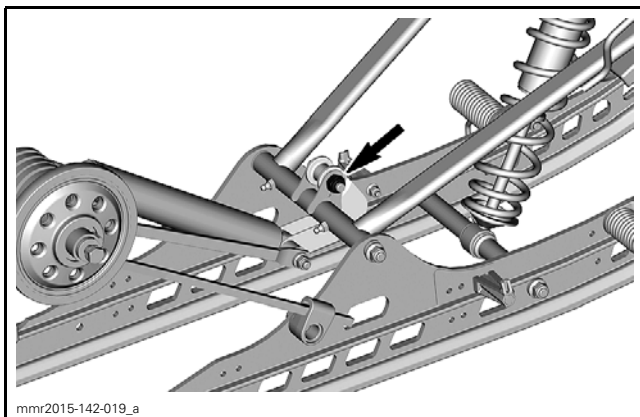
Slider Shoe Installation

The installation is the reverse of the removal procedure. However, pay attention to the following. Make sure to insert slider shoe end with hole first.

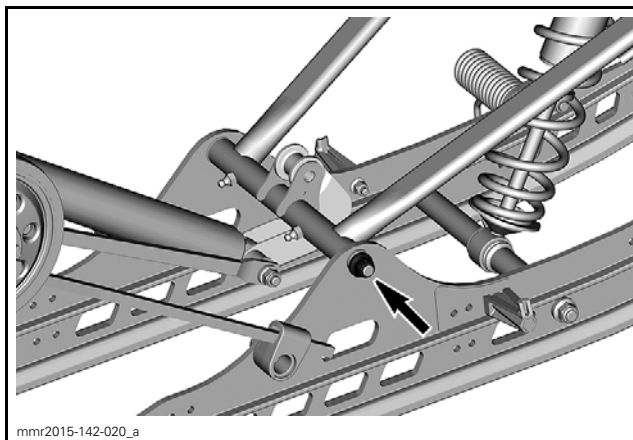
FRONT ARM

Front Arm Removal

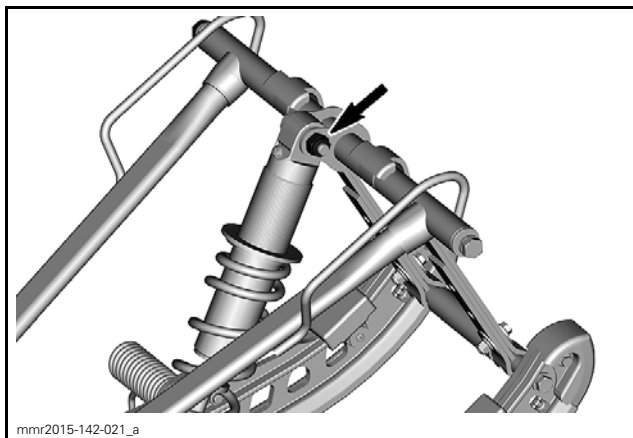
1. Proceed with *SUSPENSION ASSEMBLY REMOVAL*, see procedure in this subsection.
2. Remove nut and bolt securing rocker to front arm.



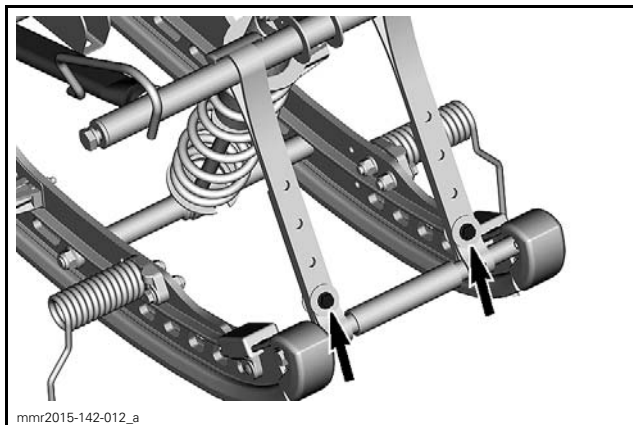
3. Remove the front arm lower bolt, nut and washers. Discard retaining nut.



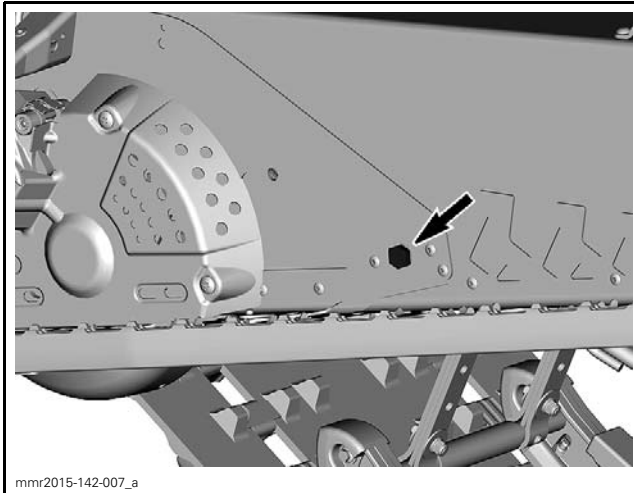
4. Remove the shock absorber upper nut and bolt.



5. Unfasten stopper straps.



6. Remove and discard front arm upper bolts.

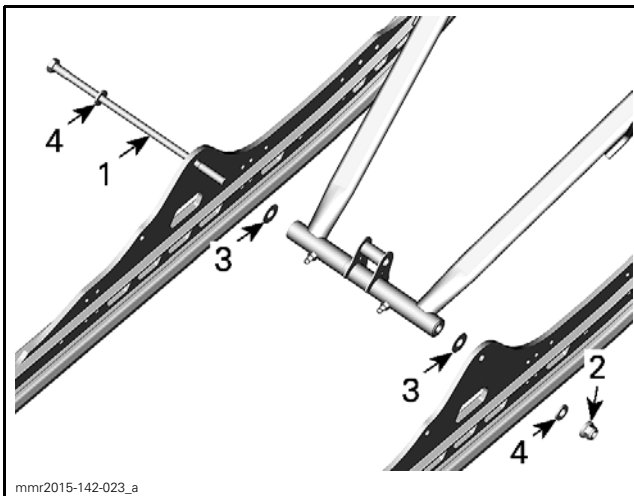


7. Remove front arm.

Front Arm Installation

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

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



1. Front arm lower bolt
2. Nut
3. Spacer washers
4. Washers

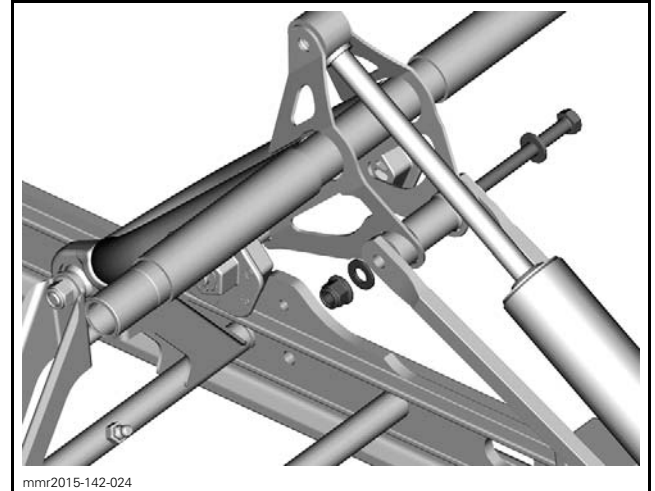
3. See front arm exploded view for proper tightening torque.

REAR ARM

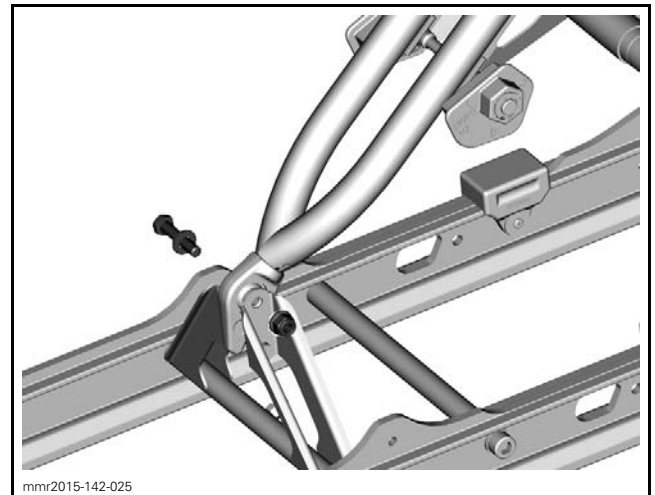
Rear Arm Removal

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 nut.
5. Remove nut and bolt securing throttle rods to rear arm.



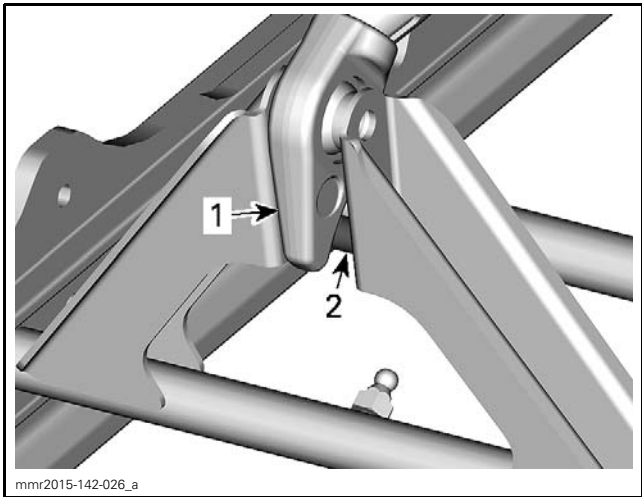
6. Remove bolt, nut and washer holding rear arm to pivot arm.



Rear Arm Installation

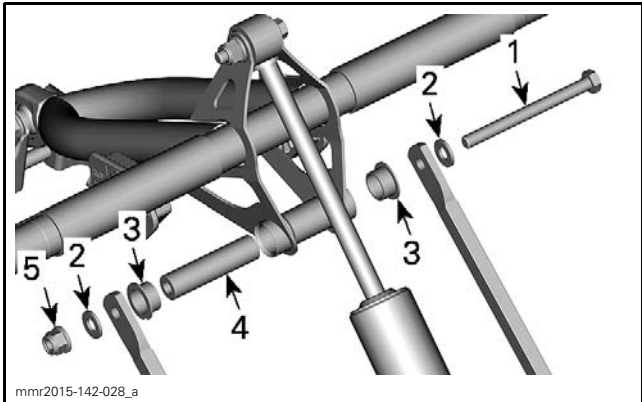
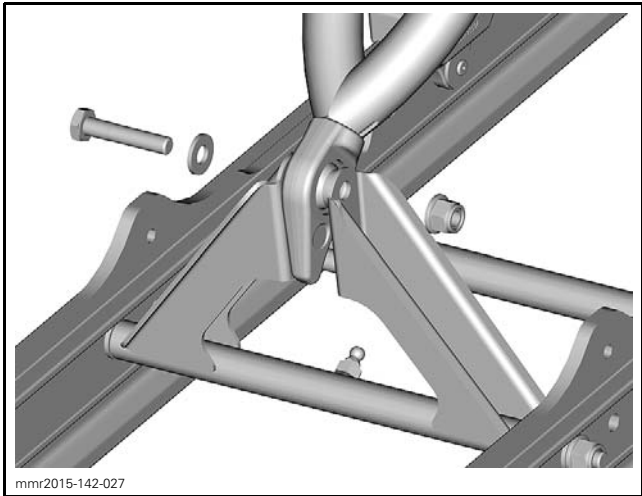
The installation is the reverse of the removal procedure. However, pay attention to the following.

1. At installation, rear arm stroke limiter must be at rear.



- 1. Rear arm stroke limiter
- 2. Pivot arm stroke limiter

2. Install **NEW** nuts and tighten to specification.
Assemble rear arm fasteners as per following illustrations.



SOME PARTS REMOVED FOR CLARITY PURPOSES

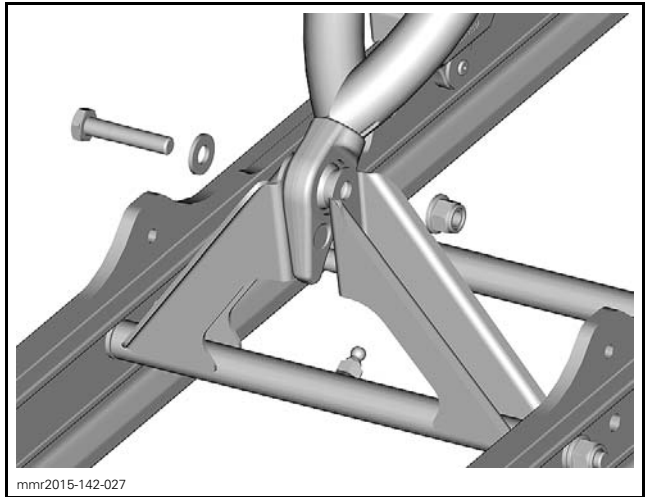
- 1. Throttle rod upper bolt
- 2. Washers
- 3. Bushings
- 4. Axle
- 5. Throttle rod upper nut

TIGHTENING TORQUE	
Rear arm throttle rod nut	25 N•m (18 lbf•ft)
Rear arm to pivot arm nut	32 N•m (24 lbf•ft)

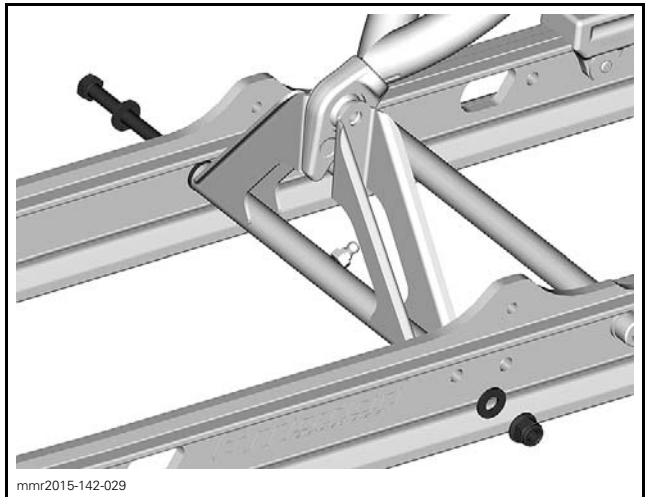
PIVOT ARM

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, nut and washer retaining rear arm to pivot arm.



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

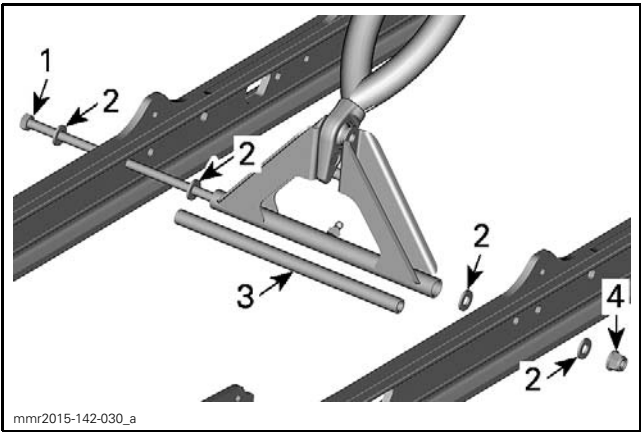
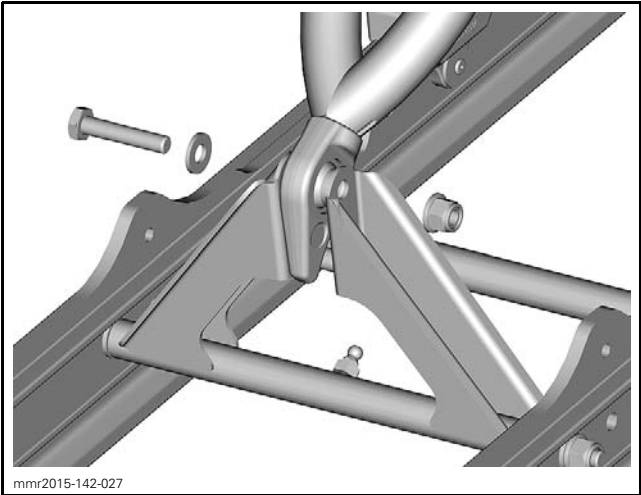


NOTE: Make sure inner washers are properly removed from assembly to avoid losing them.

- 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 fasteners as per following illustrations, with grease fitting towards front of vehicle.



PARTS REMOVED FOR CLARITY PURPOSE

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

Tighten pivot arm nuts to specification.

TIGHTENING TORQUE	
Pivot arm lower nut	25 N•m (18 lbf•ft)
Pivot arm upper nut	32 N•m (24 lbf•ft)

Lubricate pivot arm. Refer to *PERIODIC MAINTENANCE PROCEDURES* subsection.

STOPPER STRAP

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