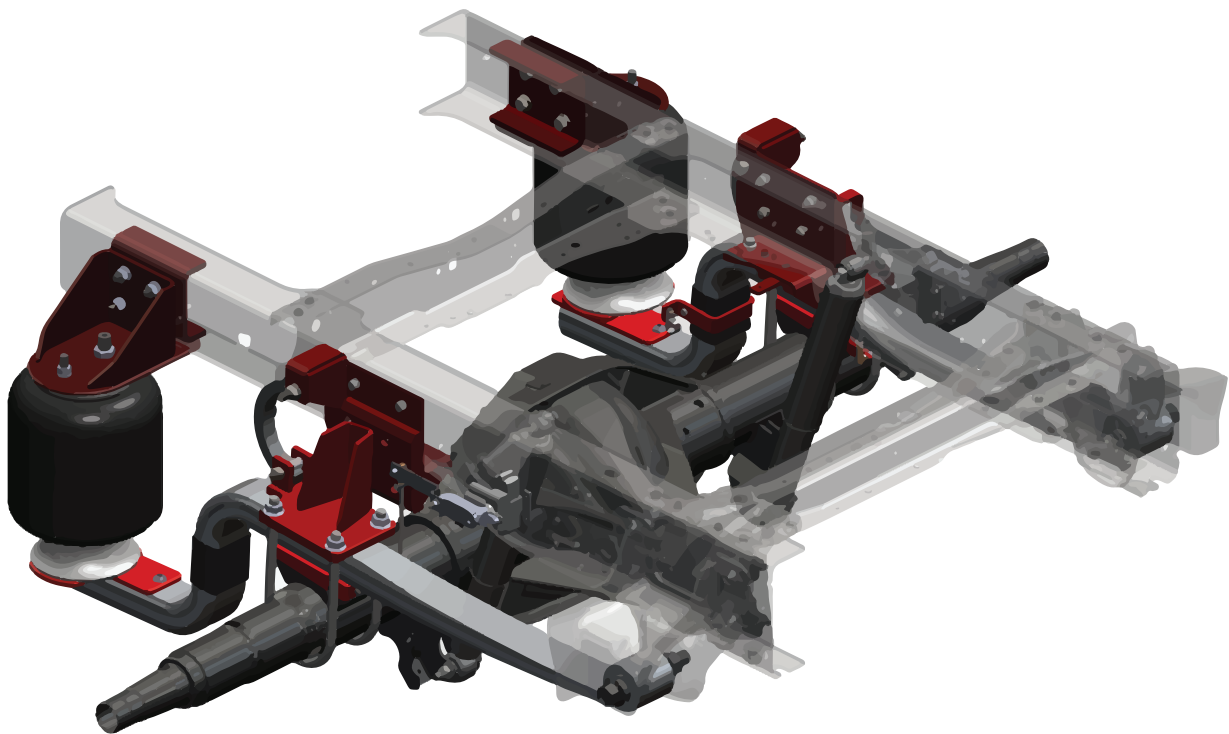




Medium-Duty Truck Suspensions Owner's Manual

RD1004F | Ford F-350 Chassis Cab

Maintenance Instructions
Service Parts



Reyco Granning Suspensions
1205 Industrial Park Drive
Mount Vernon, MO 65712
Phone: 417-466-2178
Fax: 417-466-3964
ISO Certified: 9001:2015
www.reycogranning.com

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Revision History

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OR	21153	04/05/2019	Release for Production	LLG	JWS	JAH

INTRODUCTION

Company Profile

Reyco Granning Suspensions was formed by the merger and acquisition of two well-known names in the heavy duty vehicle suspension industry—Reyco and Granning.

Reyco grew out of the Reynolds Mfg. Co and was first known as a major supplier of brake drums for heavy duty vehicles and later developed a full line of air and steel-spring suspensions for trucks, buses, trailers and motorhomes.

Granning Air Suspensions was founded in 1949 in Detroit, Michigan as a manufacturer of auxiliary lift axle suspensions. Granning later became an innovator of independent front air suspensions for the motorhome industry.

Reyco Granning manufacturing facilities are certified to the ISO 9001:2015 standards, a globally-recognized assurance that quality standards have been established and are maintained by regular rigorous audits.

Reyco Granning LLC was formed in early 2011 through a partnering of senior managers and MAT Capital, a private investment group headquartered in Long Grove, Illinois.

Congratulations on your purchase of a ReycoGranning® drive axle air suspension system. Founded in 1948 by one of the pioneers of air suspensions, ReycoGranning® Air Suspensions supplies drive and tag axle air suspension systems to a variety of original equipment manufacturers as well as to the aftermarket industry. The R-Series are utilized by OEM customers in applications such as recreational vehicles, shuttle bus, trailer, chassis builders, Type I and III ambulances and class 3 through 8 truck applications. This product line now exceeds 25 models that cover all major chassis utilized in the above applications.

Suspension Description

A ReycoGranning® drive axle air suspension system is a replacement rear suspensions system that consists of an air control system, air springs, trailing arm beams, brackets, and mounting hardware. In general, the air suspension works by maintaining a constant ride height by adjusting the amount air pressure in the air springs. This allows the vehicle to remain level, regardless of loading. By varying the amount of air pressure in the springs, a comfortable ride is maintained whether lightly or heavily loaded. This is the major difference between an air suspension and a conventional steel spring suspension. The steel spring suspension is usually designed for heavily loaded condition and thus yields a harsh ride in lightly loaded conditions. In addition, the steel spring suspension does not maintain a constant ride height under varying load conditions.

By maintaining a constant ride height, the horizontal center of gravity, steering geometry, and even the headlights remain level. The benefits of an air ride are:

INTRODUCTION

1. Driver/passenger comfort,
2. Protection of cargo, chassis and body components,
3. Reduced stress fatigue to chassis frame rails.
4. Greater stability and control.

A unique feature to the ReycoGranning® drive axle air suspension system is the wear towers and wear blocks. These time proven components prevent unwanted side to side lateral motion without the use of costly and complex track rods.

Air Control System

A primary subsystem of a ReycoGranning® drive axle air suspension system is the Air Control System. For information on how the Air Control System works, and service information for the Air Control System, refer to the manual for your specific Air Control System.

INTRODUCTION

About This Manual

This publication is intended to acquaint and assist maintenance personnel in the maintenance, service, repair and rebuild of the Reyco Granning[®] RD1004F Rear Suspension. It is important to read and understand the entire Technical Procedure publication prior to performing any maintenance, service, repair, or rebuild of this product

Reyco Granning[®] Air Suspensions reserves the right to modify the suspension and/or procedures and to change specifications at any time without notice and without incurring obligation. Contact customer service at 800-753-0050 for information on the latest version of this manual.

You must follow your company safety procedures when you service or repair the suspension. Be sure you read and understand all the procedures and instructions before you begin work on the suspension.

Reyco Granning[®] uses the following types of notes to give warning of possible safety problems and to give information that will prevent damage to equipment.



WARNING

A warning indicates procedures that must be followed exactly. Serious personal injury can occur if the procedure is not followed.



CAUTION

A caution indicates procedures that must be followed exactly. Damage to equipment or suspension components and personal injury can occur if the procedure is not followed.

NOTE

A note indicates an operation, procedure or instruction that is important for correct service.

Some procedures require the use of special tools for safe and correct service. Failure to use these special tools when required can cause personal injury or damage to suspension components.

The latest revision of this publication is available online at <http://www.Reyco Granning.com/> Reyco Granning[®] Air Suspensions has developed this owner's manual to aid in the maintenance of Reyco Granning[®]'s rear suspensions.

GENERAL INFORMATION

Range of Motion and Capacity

The following table lists the various models and their respective capacities.

Model	Suspension Capacity	Axle Capacity
RD1004F	10,040 lbs.	10,040 lbs.

Overloading the suspension may result in adverse ride and handling characteristics.

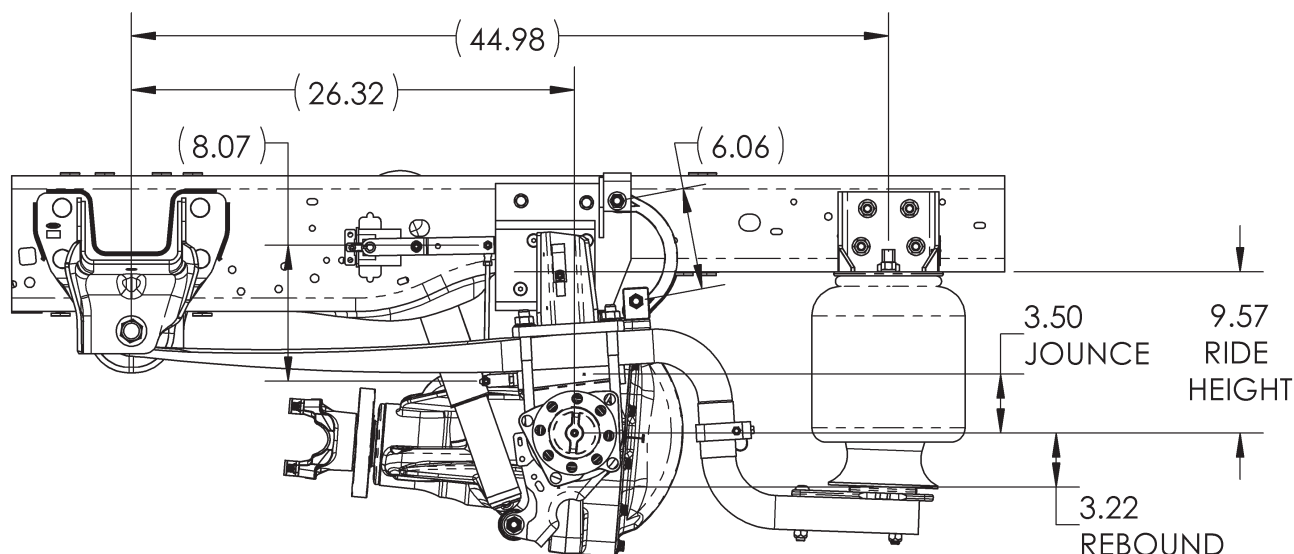


Figure 1: Suspension range of motion

Note: The ride height is for the completed vehicle with body and components. See table below for correct vehicle dimensions.

Chassis	Reyco Granning ® Suspension Model	Ride Height *	Jounce Travel	Rebound Travel
Ford F350 Chassis Cab	RD1004F	9.57"	3.50"	3.22"

*Ride height is measured from the axle center (flat and level) to the bottom of the vehicle frame as close to directly above the axle as possible.

GENERAL INFORMATION

Identification

The suspension model and serial number are stamped on an aluminum tag that is riveted to the driver side upper Upper Air Spring Mount (location visible in the Main Exploded View). The serial number is used by **Reyco Granning**® for control purposes and should be referred to when servicing the suspension (See Figure 2).

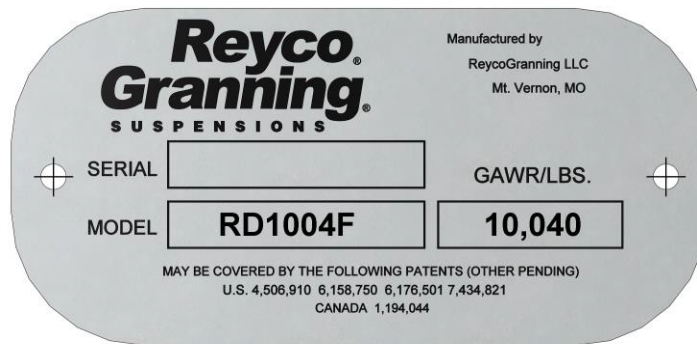


Figure 2: Suspension Identification

PARTS LIST

RD1004F

ITEM#	QTY	PART#	DESCRIPTION	ITEM#	QTY	PART#	DESCRIPTION
1	1	702150-01	Asy, Backing Plate, LH	28	2	8219758	LN 3/4-16, Gr. 5, ZP
2	1	702150-02	Asy, Backing Plate, RH	29	2	8120384	SLW 1/2 .523x.873x.135, ZN
3	6	302	FHB 3/8-16 x 1.25 GR 8 ZN	30	2	8120378	N 1/2-13, Gr. 5, ZP
4	6	702605-01	LFN 3/8-16, Gr. G, ZN	31	2	5449	Rebound Strap 8.75 x 1.00
5	4	702145-01	Shim 5.3Wx5.9Lx1/16	32	2	6573	Spacer, Rebound Strap (2.937)
6	1	702149-01	Wear Pad, LH	33	2	8274318	HHB 1/2-20 x 5, Gr. 8, ZN
7	1	702149-02	Wear Pad, RH	34	2	118	FW 1/2 .531x1.062x.095, ZP
8	8	702635-01	SFHCS 3/8-24 x 1 1/2 GR 8 ZN	35	2	7132	Sleeve, Rebound Strap (1.20)
9	8	304	LFN 3/8-24 GR F Zinc	36	2	8455030	HHB 1/2-20 x 2.75, Gr. 8
10	2	714978-01	Upper Air Spring Mount	37	1	8876	Brkt, Parking Brake Cable
11	2	714980-01	UASP Backing Plate	38	1	314	HHB 1/4-20x4.00 GR8 ZN
12	8	276	FHB 1/2-13 x 1.75 GR 8 ZN	39	3	100703-P1	LN 1/4-20 Stover GR8 ZN
13	8	308	LFN 1/2-13, GR. G ZN	40	2	8628	Clip, Tube/Wire .75 .281 Hole
14	2	715060-01	Spring Beam Assembly	41	2	101563-P1	HHB 1/4-20x.75 GR5 ZN
15	1	714995-01	Axle Wedge Spacer Assy, LH	42	2	709953-02	Height Control Linkage 8.10"
16	1	714995-02	Axle Wedge Spacer Assy, RH	43	4	8454750	LN 1/4-28 GR 5
17	1	714986-01	Wear Tower Weldment, LH	44	1	711358-01	Installation: Serial Tag
18	1	714986-02	Wear Tower Weldment, RH	44.1	1	2617	Serial Tag
19	4	701546-02	U-Bolt 5/8-18 x 9.75	44.2	2	188	Pop Rivet 1/8" dia. x .525" long
20	8	4599	LFN 5/8-18, GR G, PH	*45	1	708580-01	Heat Shield, Flexible (Not Shown)
21	1	710667-01	Lower Air Spring Mount, LH	*46	1	D714127	Kit, Drawing/Doc RD1004F
22	1	710667-02	Lower Air Spring Mount, RH	*46.1	1	D5602	Sheet, Caution, Comp fittings
23	2	8609	Air Spring Assembly	*46.2	1	D714086	Drawing, Installation RD1004F
24	2	5559	HHB 1/2-13 x 4.50, Gr. 5 ZN	*46.3	1	D714128	Document, Install Instructions
25	2	8455031	HHB 1/2-20x3 Gr.8 ZN	*46.4	1	D714129	Document, Installation Checklist
26	2	714994-03082	SBHCS 1/2-20 x 3.00 GR8 ZN	*46.5	1	D714130	Document, Owner's Manual
27	8	89422302	LN 1/2-20, Gr. C				

*Not Shown/Called Out

PARTS LIST

Main Exploded V iew

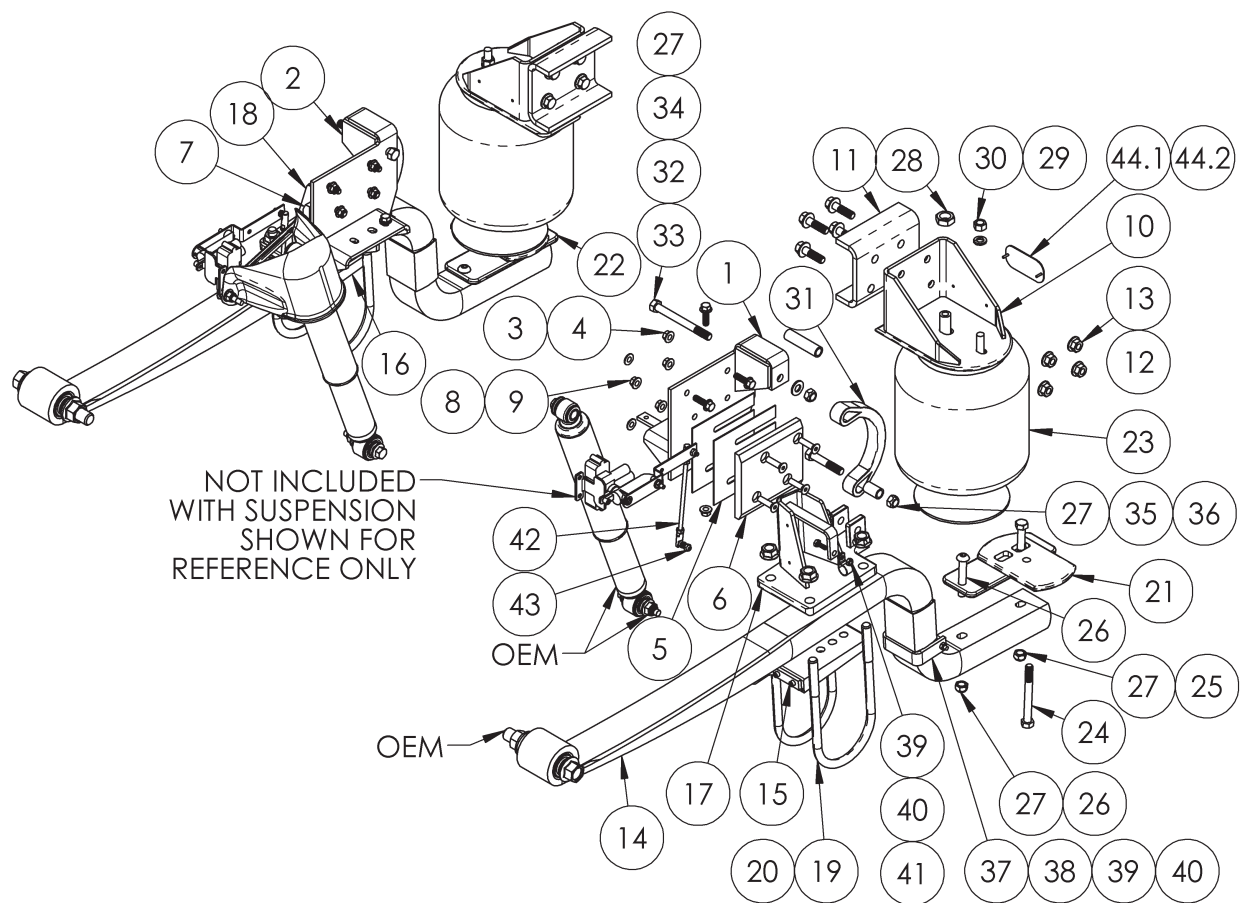


Figure 6: Main exploded view

PARTS LIST

Detailed Exploded Views

Installation Notes:

1. Install 1/2-13 x 4.50 Hex Head Bolt (part number 5559) into lower air spring pad assemblies before mounting lower air spring pad assemblies to spring beam assemblies.
2. Insure that piston & lower retainer of air spring are flush with lower air spring pad assembly mounting surface before tightening mounting bolt. (Inflate air spring with a small amount of air to seat the piston)
3. The Rebound Strap has a natural curve (it bends one direction easier than the other). It has more stitching on the outside of the bend. Install the natural curve in the position shown.

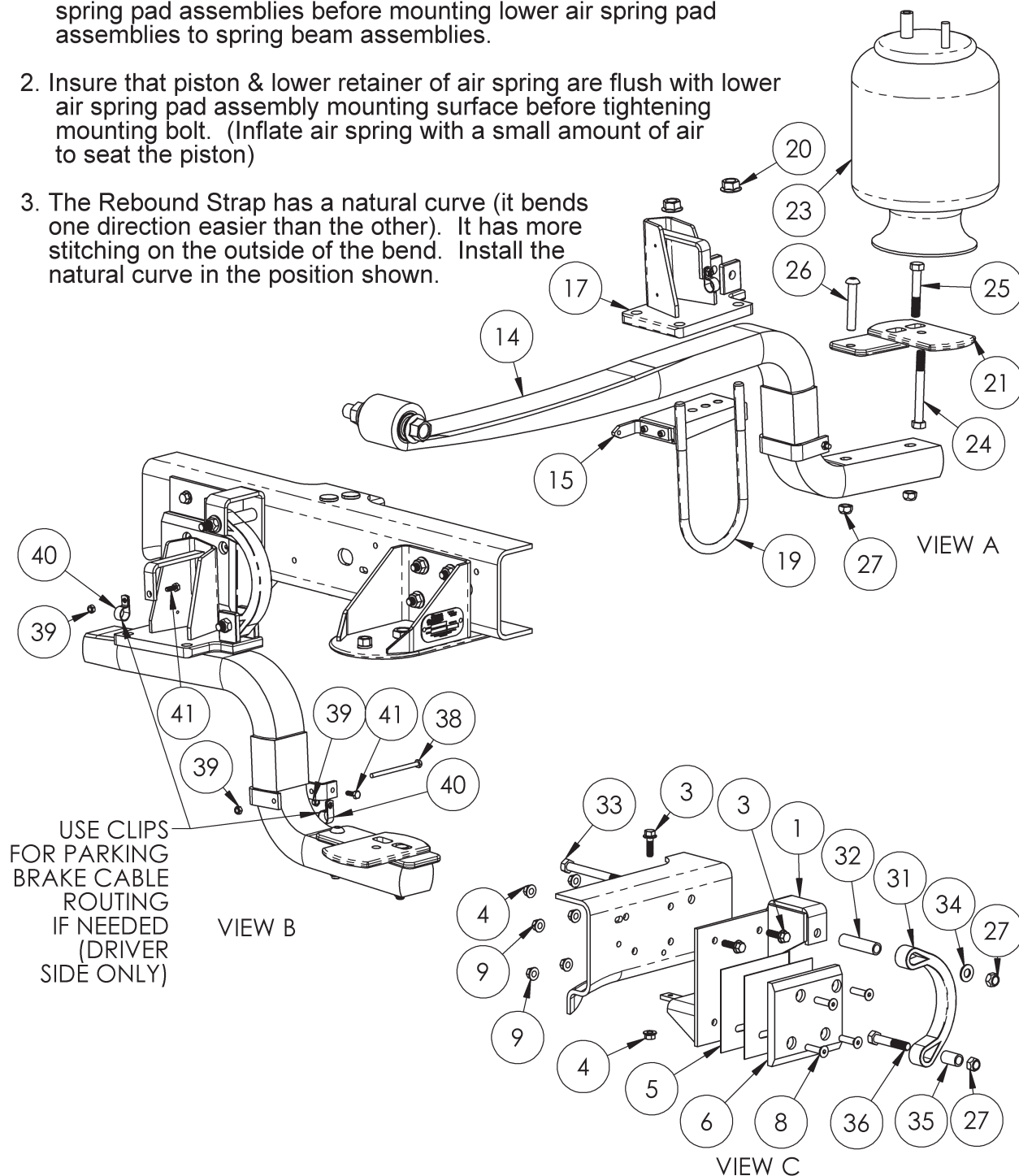


Figure 7: Detailed exploded views "A", "B" and "C "

PARTS LIST

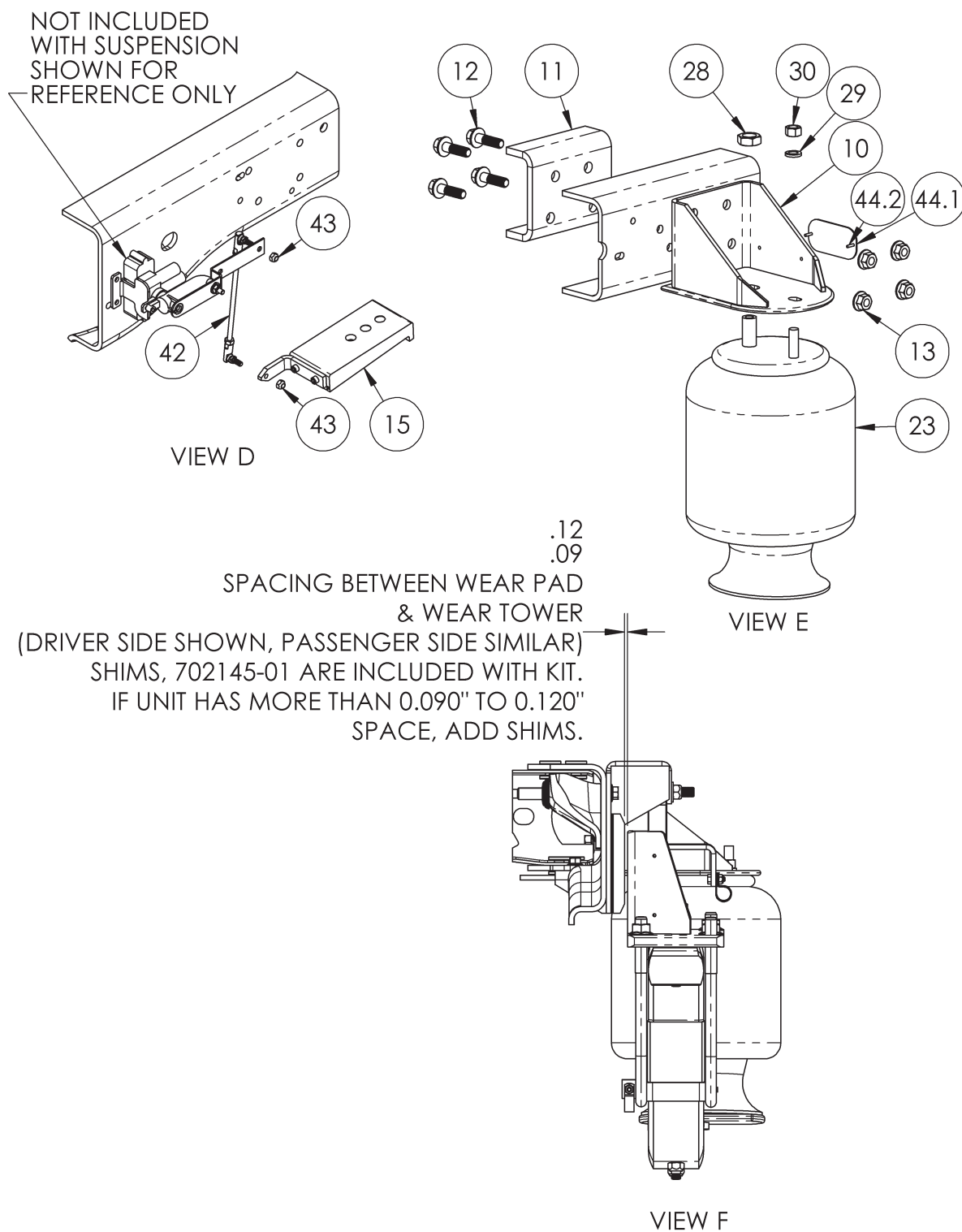


Figure 8: Detailed exploded views "D", " E", and "F "

INSPECTION & MAINTENANCE

Perform a thorough visual inspection of the suspension to ensure proper assembly and to identify broken parts and loose fasteners each time the vehicle suspension is serviced. Do the following during an inspection.

- Fasteners - Using a calibrated torque wrench check that all the fasteners are tightened to the proper torque.
- Wear and Damage - Inspect components of the suspension for wear and damage. Look for bent or broken components. Replace all worn or damaged components.
- Operation - Check that all components move freely through the complete turning arc.



CAUTION: **Reyco Granning**® recommends replacing any damaged or out of-specification components. Reconditioning or field repairs of major rear suspension components is not allowed.

Note: Refer to Parts List Section for identification of components.

NOTE: **Reyco Granning**® recommends the use of a maintenance pit or full vehicle lift during the inspection of components.



WARNING: Never work under a vehicle supported by only a jack. Jacks can slip or fall over and cause serious personal injury. Always use safety stands.

INSPECTION & MAINTENANCE

Torque Specifications

Most threaded fasteners are covered by specifications that define required mechanical properties, such as tensile strength, yield strength, proof load, and hardness. These specifications are carefully considered in initial selection of fasteners for a given application. To assure continued satisfactory vehicle performance, replacement fasteners used should be of the correct strength, as well as the correct nominal diameter, thread pitch, length, and finish.

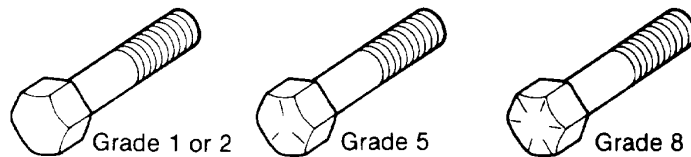


Figure 10: Grade Markings on Bolts



Grade	Lock Nut Grade B, F	Lock Nut: Grade C, G
Identification	 3 Dots	 6 Dots

Figure 11: Grade Markings on Lock Nuts

INSPECTION & MAINTENANCE

Reyco Granning Recommended Torque Specifications			
Item	Assembly	Fastener	Torque
1	Spring Beam Pivot Connection	OEM (M22)	490 ft-lbs
2	Upper Air Spring Mount (to Frame)	FHB 1/2-13 x 1.75, GR 8 ZN (LFN 1/2-13, GR G ZN)	80 ft-lbs
3	Lower Air Spring Mount (to Beam)	HHB 1/2-20 x 3, GR 8 ZN (LN 1/2-20, GR C)	90 ft-lbs
4	Air Spring to Lower Air Spring Mount	HHB 1/2-13 x 4.50, GR 5 ZN	35 ft-lbs
5	Air Spring: Stud Nut & Air Port Nut	N 1/2-13 GR 5 ZP & JN 3/4-16 GR 5 ZP	35 ft-lbs
6	Wear Pad Backing Brkt to Frame(side)	FHB 3/8-16 X 1.25, GR 8 ZN (LFN 3/8-16, GR G, ZN)	35 ft-lbs
7	Wear Pad Backing Brkt to Frame(bottom)	FHB 3/8-16 X 1.25, GR 8 ZN (LFN 3/8-16, GR G, ZN)	35 ft-lbs
8	Wear Pad to Backing Bracket	SFHCS 3/8-24 x 1.5 & 2 GR8 PH (LFN 3/8-24, GR F ZN)	100 in-lbs
9	Rebound Strap Upper & Lower Mount	HHB 1/2-20 x 5.0 & 2.75, GR 8 (LN 1/2-20 GR C)	90 ft-lbs
10	U-Bolt Nuts (See Figure A)	U-BOLT (Axle) 5/8-18x 9.75 (HN 5/8-18, GR C)	190 ft-lbs
11	Height Control Linkage	LN 1/4-28 Gr 5	10 ft-lbs
12	Parking Brake Cable Mount	HHB 1/4-20 x .75 & 4 (LN 1/4-20 GR8 ZN)	10 ft-lbs
*13	HC Sensor Bolts (to Frame)	HHB 1/4-20 X .75 GR 5 ZN (N 1/4-20, GR 5 ZP)	8 ft-lbs
*14	**Shock Bolt – Upper	**See Vehicle Owner's Manual	**
*15	**Shock Bolt – Lower	**See Vehicle Owner's Manual	**
*16	**Wheels	**See Vehicle Owner's Manual	**
<p>* Not Shown</p> <p>**Follow procedures and torques listed in Vehicle Maintenance/Owner's Manual</p> <p>Note: Torque values listed above apply only if Reyco Granning supplied fasteners are used. For information regarding component replacement or technical service call 1-800-753-0050</p>			

See Figure 12 for Illustrated Torque Callouts

INSPECTION & MAINTENANCE

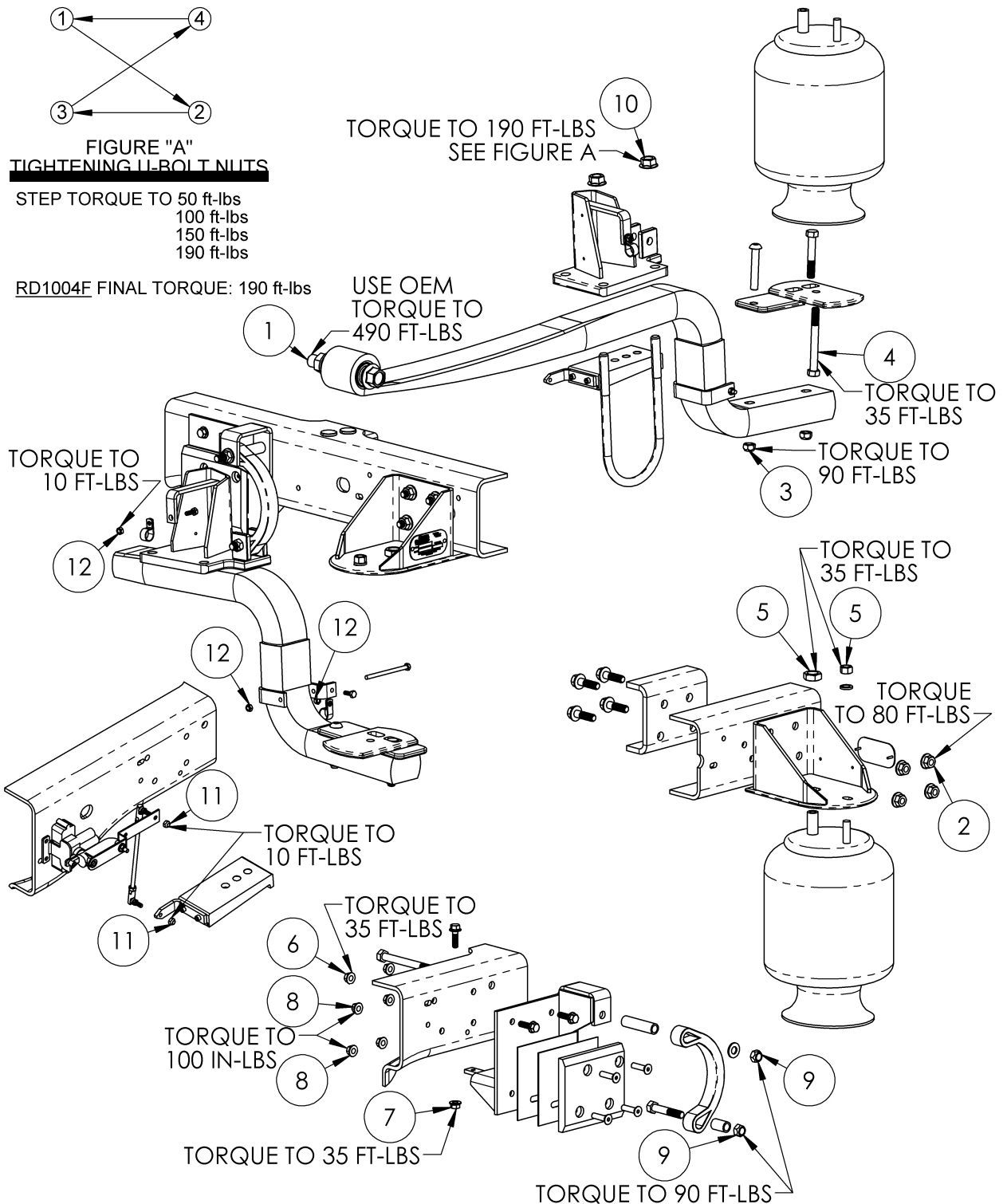


Figure 12: Illustrated Torque Callouts

INSPECTION & MAINTENANCE

Maintenance Schedule

GENERAL MAINTENANCE	SERVICE TO BE PERFORMED	MILEAGE IN THOUSANDS							
		12	24	36	48	60	72	84	96
Spring Beam Pivot Connection	Check bolt torque.	X			X				X ¹
	Inspect for contact between Spring Beam and Hanger.	X	X	X	X	X	X	X	X ¹
	Inspect for bushing wear.	X	X	X	X	X	X	X	X ¹
Air Springs	Inspect for proper clearance (1" minimum all around).	X							
	Check upper mount nut and lower mount bolt torque.	X							
	Inspect for signs of chafing or wear.	X	X	X	X	X	X	X	X ¹
	Check for air line fitting torque.	X							
	Inspect for air leaks using soapy water solution.	X							
Height Control Linkage	Inspect for signs of bending, binding, or slippage.	X	X	X	X	X	X	X	X ¹
Shock Absorbers	Check stud mount and lock nut torque.	X							
	Inspect shocks for signs of fluid leak, broken eye ends, loose fasteners, or worn bushings.	X	X	X	X	X	X	X	X ¹
Axle Connection/ U-Bolts ⁴	Check "U"-bolt nut torque ⁴ and gap between wear pad and wear tower.	X	X	X	X	X	X	X	X
Wheels ²	Check lug nut torque ³	X	X	X	X	X	X	X	X
Rear Alignment	Inspect (after first 1000-3000 miles)		X		X		X		X ¹

¹ Continue to perform specified maintenance every 12,000 miles.

² See your vehicle's owner's manual for instructions regarding the maintenance of wheels and tires.

³ Wheel lug nuts must be retightened to proper torque specifications as per the vehicle or chassis manufacturer's Owner Guide.

⁴ **U-bolts** require an initial **re-torque at 1000 miles**, then follow regular maintenance schedule in chart above.

[illegible]

TROUBLE SHOOTING

SYMPTOMS	POSSIBLE CAUSES	REMEDIES
Tires wear out quickly or have uneven tire tread wear. Note: Wear pattern will indicate possible cause(s). Consult tire manufacturer for guidance.	1) Tires have incorrect pressure. 2) Tires out of balance. 3) Incorrect ride height. 4) Incorrect rear axle alignment. 5) Improper (mismatched) tires and wheels.	1) Put specified air pressure in tires. 2) Balance or replace tires. 3) Adjust ride height to specified setting. 4) Align rear axle to specified thrust angle. 5) Install correct tire and wheel combination.
Vehicle rolls side to side excessively.	1) Shock absorbers worn. 2) Shock eye bushings worn. 3) Axle U-bolts are loose 4) Loose or worn Spring Beam Pivot connection(s). 5) Loose or worn Spring Beam Pivot bushing(s). 6) Check for air leak including the height control valve.	1) Replace shock absorbers as needed. 2) Check and replace as needed.. 3) Tighten (see previous torque chart) or replace as required 4) Tighten (see previous torque chart) or replace as required 5) Replace as required 6) Check height control valve and replace as required.
Vehicle ride is too harsh and/or suspension contacts stops excessively.	1) Shock absorbers worn. 2) Incorrect ride height. 3) Vehicle overloaded. 4) Air spring supply lines leaking or obstructed. 5) Vehicle system air pressure below specification. 6) Jounce bumper in air spring worn or broken. 7) Air Suspension not turned on. 8) Defective Height Control Valve(s) 9) Height Control Linkage disconnected or damaged	1) Replace shock absorbers as needed. 2) Adjust ride height to specified setting. 3) Check wheel loads and correct as needed. 4) Check air line connections and remove obstructions. 5) Check air pressure and correct as needed. 6) Check and replace air spring as required. 7) Turn on air suspension. 8) Replace height control valve as required. 9) Reattach or replace as required.
Vehicle ride is too soft.	1) Shock absorbers worn. 2) Incorrect ride height.	1) Replace shock absorbers as needed. 2) Adjust ride height to specified setting.

TROUBLE SHOOTING

SYMPTOMS	POSSIBLE CAUSES	REMEDIES
Suspension does not maintain ride height.	1) Air leak. 2) Internal leak in height control valve. 3) Height control valve linkage loose. 4) Air spring chafed or worn.	1) Check connections with soapy water solution and repair or replace as needed. 2) Check height control valve and replace as required. 3) Check and tighten linkage as needed. 4) Check air spring and replace as needed.

REPLACEMENT INSTRUCTIONS & WARRANTY

R-SERIES

Replacement Instructions

NOTE: Due to the nature of service to be performed it is recommended that a qualified mechanic do the work.



Limited Warranty

ReycoGranning® warrants its R-Series suspensions to be free from defects in material and workmanship under normal use and service in the U.S. and Canada.

Main Structural Components -- 24 months or 50,000 miles, whichever occurs first. Defined as: hangers, beams, clip plates and axle saddles.

Other Air Suspension Components -- 12 months or 24,000 miles, whichever occurs first - valves, fasteners, bushings, and other components not stated specifically (when provided by ReycoGranning®), and other fabricated metal components. ReycoGranning® provides no warranties on components such as axles, air springs, controls, air compressors, brakes, shock absorbers, and hub and drum assemblies, except to the extent of any warranty provided to ReycoGranning® Suspensions by the manufacturer of such components.

Labor -- 6 months or 12,000 miles whichever comes first. Labor will be allowed on ReycoGranning® Suspensions estimated time to make repairs at a maximum rate of \$50.00 per hour. As used herein, the term "normal use and service" means that the suspension will be installed, operated, inspected and maintained in accordance with the applicable ReycoGranning® Suspensions owner's manual, and any applicable vehicle owner's manual or instructions.

Adjustments

The starting date for the above warranty period is the date of purchase of the suspension by the first end user. Proof of such date is the responsibility of the first end user. If the purchase date is not established to ReycoGranning® Suspensions satisfaction, the date of manufacture determined from the suspension system's serial number shall be used as the effective starting date. When adjustment is sought under this warranty, a claim should be made by contacting the distributor or manufacturer who installed the suspension, who will coordinate the fix, documentation, parts shipment, etc. directly with ReycoGranning® Suspensions.

NOTE ReycoGranning® Suspensions must be notified in writing using a warranty claim form promptly upon claimed defect.

INSTALLER AND END USER RESPONSIBILITIES

The Distributor/Installer is responsible for installing the product according to ReycoGranning® Suspensions approved procedures, the installer is also responsible (either directly or through its agent/dealer) for providing a copy of ReycoGranning® Suspensions warranty and owner's manual to the end user, and for advising the end user of proper use, service and maintenance required for the product. The end user is responsible for operating, inspecting and maintaining the suspension according to the instructions in the ReycoGranning® Suspensions owner's manual and any applicable vehicle owner's manual, and for properly instructing all operators and maintenance personnel.

NOTE Warranty may be denied for improper installation.

LIMITATIONS AND EXCLUSIONS

No warranty applies in the event of: use of components, parts and/or accessories not obtained from or approved by ReycoGranning® Suspensions or which do not meet ReycoGranning® Suspensions quality and performance specifications; improper installation, maintenance or repair; misuse or abuse including but not limited to overloading; or unauthorized alterations or modifications.

THE ABOVE WARRANTIES ARE SUBJECT TO THE "WARRANTY LIMITATIONS" AND "REMEDIES" SECTIONS OR REYCOGRANNING® SUSPENSIONS INVOICE TERMS AND CONDITIONS.

This policy supersedes any previous warranty statements.

03/2005



1205 Industrial Park Drive
Mount Vernon, Missouri USA 65712
Tel (417) 466-2178 Fax (417) 466-3964
www.reycogranning.com

3216 Olympia Drive, Suites C & D
Lafayette, Indiana USA 47909
Tel (765) 838-0361 Fax (765) 838-1694
www.reycogranning.com

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Reyco[®] **Granning[®]** **S U S P E N S I O N S**

Reyco Granning Suspensions
1205 Industrial Park Drive
Mount Vernon, MO 65712
Phone: 417-466-2178
Fax: 417-466-3964
ISO Certified: 9001:2015
www.reycogranning.com