

# T-Series Maintenance Manual

Trailer-Truck Air Suspension Systems

#### THIS MANUAL TO REMAIN WITH VEHICLE



#### **Service Notes**

Following the service and maintenance information in this publication will contribute to improve performance and greater service from ReycoGranning® Suspensions.

The information contained in this manual was current at the time of printing and is subject to change without notice or liability. Tuthill reserves the right to modify suspension product or maintenance procedures and to change specifications at any time without notice and without recurring obligation.

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



# ReycoGranning® Suspensions

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### Air Ride Operation

Build and maintain air pressure in excess of 65 psi to inflate the air springs of the suspension.

To protect the air spring, maintain a minimum 3 psi operating pressure in the air spring. The air brake protection valve in the system automatically maintains 65 psi in the brake system if there is a pressure loss in the suspension.

Determine air spring psi requirement (using the chart below) and activate the manual control valve to inflate the air springs to the proper psi level for the axle load based on the ReycoGranning® Suspension being used.

AXLE*		T-200AM121	T200AX161 T200AM161
LOAD	T-300A	T-200AX121	T200AX191 T200AM191
	psi	psi	psi
4000	13	21	20
7000	29	55	42
10000	45	81	60
12000	52	100	75
13000	60	-	83
16000	75	-	100
18000	85	-	115
19000	90	-	122
20000	95	-	-
22500	-	-	-
25000	-	-	-

\*NOTE: The above chart is to be used as a GUIDE ONLY.

The air pressure vs. load shown above is approximate and may vary. To obtain an accurate Load To Air Pressure reading, the vehicle should be calibrated over a level and accurate scale.

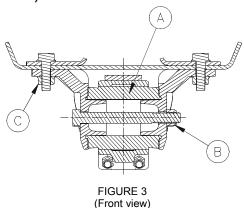
**CAUTION:** DO NOT OVERLOAD AXLE; MAXIMUM SUSPENSION CAPACITY IS 25,000 lbs.

**CAUTION:** AIR SPRINGS SHOULD NEVER BE INFLATED ABOVE 100 PSI AIR PRESSURE.

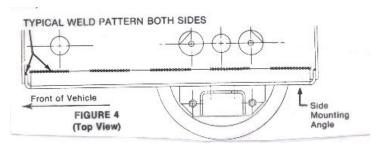


# Pre-Service Inspections T-200AX, T200AM, and T-300A

- 1. Observe that torque bushing is centered in drawbar casting (See "A", Figure 3).
- 2. Assure that ¾" torque bushing nut is torqued to 320 ft. lbs. lubricated (See "B" Figure 3).
- 3. Assure that the 5/8" end bearing nuts (6) with washers are torqued to 180 ft. lbs. After torque bushing bolt is secured (See "C", Figure 3).



 On "AX" series suspensions, inspect side-mounting angles for proper and adequate welds on both sides (See Figure 4) (NOTE: See Page 8 for welding inspection).



- 5. Verify vehicle cross members are located fore and aft suspension, not to exceed 12" from suspension.
- 6. Air springs (See Page 5).



# Pre-Service Inspections (All T-Series Models)

#### Air Springs

- 1. Pressurize Air Springs.
- 2. Verify there are no leaks in the air system lines or fittings.
- 3. Maintain 1" clearance around air springs inflated to 100 psi.
- 4. Maintain suspension ride height (bottom of frame to centerline of axle) in the operating range specified below.

RIDE HEIGHT CHART		
MODEL NO. RIDE HEIGHT DIM. (LOADED)		
T-200AX	15"	
T-200AM	17.56"	
T-300A	12"	

**CAUTION:** INSPECTION SHOULD BE PERFORMED BY A QUALIFIED MECHANIC OR REYCOGRANNING® SUSPENSIONS SERVICE CENTER.

**CAUTION:** IF ANY ITEMS DO NOT MEET PRE-SERVICE INSPECTION, CONTACT THE INSTALLER OR A QUALIFIED REYCOGRANNING® SUSPENSIONS SERVICE CENTER.



### **T-Series Component Inspections**

Key components should be inspected regularly for maximum service life. The severity of vehicle operation can vary individual component service life. The inspection cycles recommended here are only minimum suggestions.

#### AIR SPRINGS

Maintain a minimum operating pressure of 3 psi to prevent damage. Properly used air springs can deliver over 500,000 miles of service. If inspection indicated the air spring is rubbing adjacent vehicle or suspension components, correct the problem and replace the bellow for safe trouble free operation.

#### 2. AXLE CONNECTIONS

Inspect welds at axle attachment points. If any welds do not have proper fillets or cracks appear, contact your ReycoGranning® Suspensions Service Center.

**CAUTION:** DO NOT OPERATE THE VEHICLE WITH CRACKED WELDS ON THE SUSPENSION.

#### 3. FRONT PIVOT CONNECTION

Inspect front rubber bushings, end bearings, nuts and bolts at 100,000 miles or as required to avoid premature wear of the front rubber bushed pivot connection.

**CAUTION:** LOOSENESS IN THIS AREA CAN CAUSE A CHANGE IN HANDLING AND INCREASED TIRE WEAR.

#### 4. SHOCK ABSORBERS

Inspect and replace shock absorbers showing any sign of leaking hydraulic fluid, or mechanical damage.

#### 5. AIR REGULATOR VALVE

Controlling adequate air pressure in the air springs, the air regulator valve insures proper axle loading is maintained. For maximum system performance, keep the air system clean and drain the air tanks frequently.



#### Periodic Inspections

#### First 1,000 Mile Inspection

After the REYCOGRANNING® SUSPENSION has been in service for approximately 1,000 miles, check all bolts and nuts for proper torque. See torque chart below.

NOTE: Torque values should be checked with an approved calibrated torque wrench.

TORQUE CHART (Cleaned & Oiled)				
SUSPE	NSION BOLTS	<u>REMARKS</u>		
3/4"	320ft. Lbs.			
3/4"*	200ft. Lbs.	Shock Bolts		
3/4"*	35ft. Lbs.	Air Spring Nuts		
5/8"	180ft. Lbs.			
1/2"	90ft. Lbs.			
1/2"*	35ft. Lbs.	Air Spring Nuts		

\* Use Grade 5 Fasteners.

**NOTE:** All other fasteners in the suspension are Grade 8.

#### First 3,000-Mile Inspection

- 1. Following the first 3,000 miles of operation, the nuts and bolts should be inspected for proper torquing as indicated in the chart above.
- 2. With vehicle on level surface, activate hand control valve and check air system for leaks with air pressure in excess of 65 psi.
- 3. Maintain 1" clearance around air spring at 100 psi.

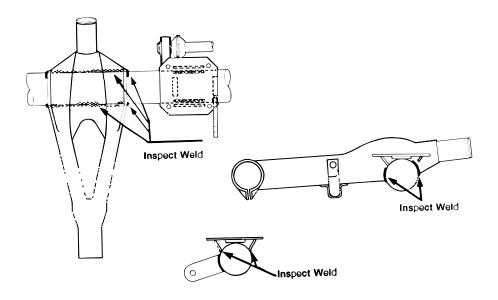
#### 50,000 Miles

- 1. Recheck 3,000 miles inspection items.
- 2. Raise vehicle frame, allowing axle to hand down, and check air springs for any signs of chafing or wear.
- 3. Move axle up and down and inspect for looseness or worn parts at the front pivot connections
- 4. Inspect axle connection welds. If cracked, scarf out and reweld. This must be done by a qualified person or any ReycoGranning® Suspensions Service Center.
- 5. Check shock absorbers for any signs of leaking hydraulic fluid, broken end connections and worn rubber bushings. Repair or replace if any of the above exists.

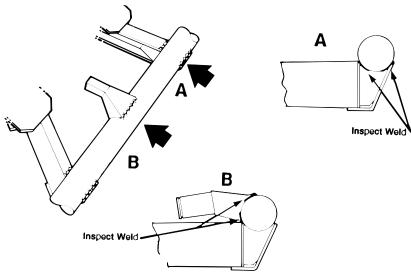


# WELDING INSPECTION T-300A SERIES

Inspect indicated areas for weld cracks. (If weld crack are found, repair is necessary by a qualified welder. ReycoGranning® should be contacted for correct welding procedures.)



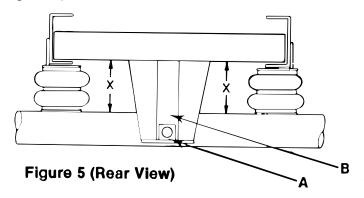
### T-200 AX and AM MODELS





## AIR LIFT INSPECTION T502L

1. Position axle so that rear guide block is down against lower suspension stop (See Figure 5).



On all Suspensions, Travel Block "A" must be at bottom of Guide Slot "B". Distance "X" must be equal on left & right side of axle when adjusting lift cables.

2. Check lift tube and adjusting nut clearance for ½" minimum clearance. This is to assure that suspension bottoms out on lower stop and not the lift cables (See "A" below in Figure 6).

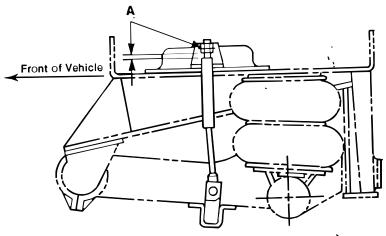
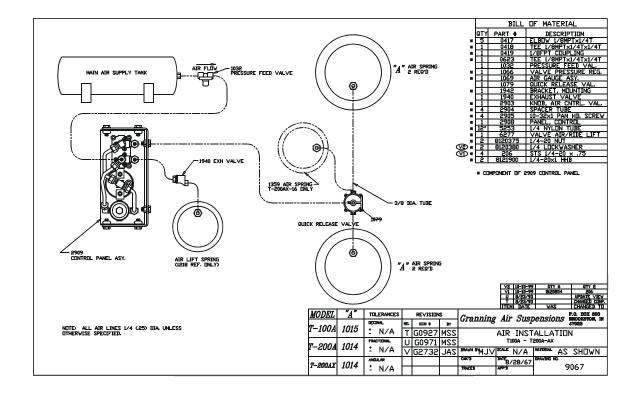


Figure 6 (Side View)

**CAUTION**: INSPECTION SHOULD BE PERFORMED BY A QUALIFIED REYCOGRANNING® SERVICE CENTER.

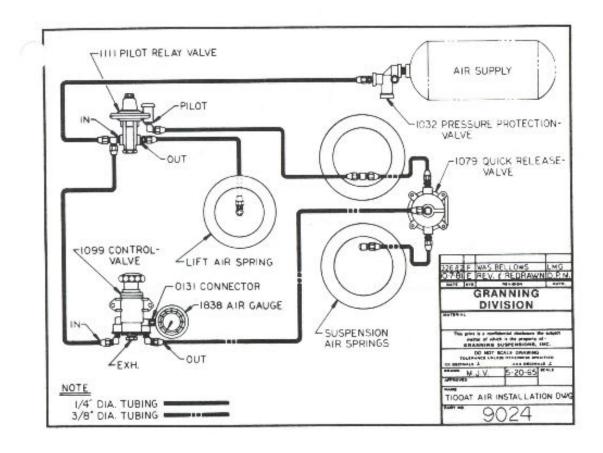


# AIR CONTROLS T-200AX and T-200AM CAB AIR CONTROL



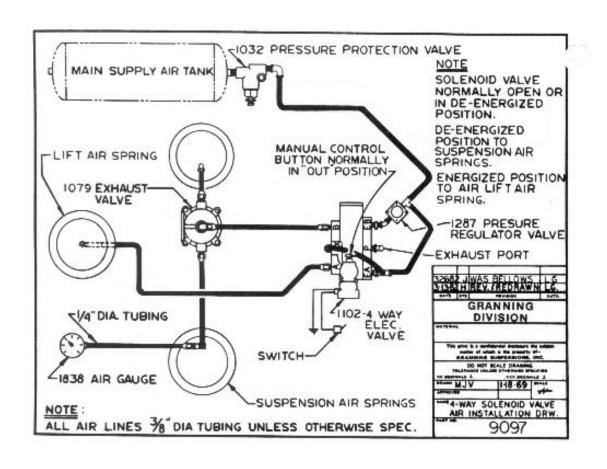


# AIR CONTROLS MANUAL AIR CONTROL



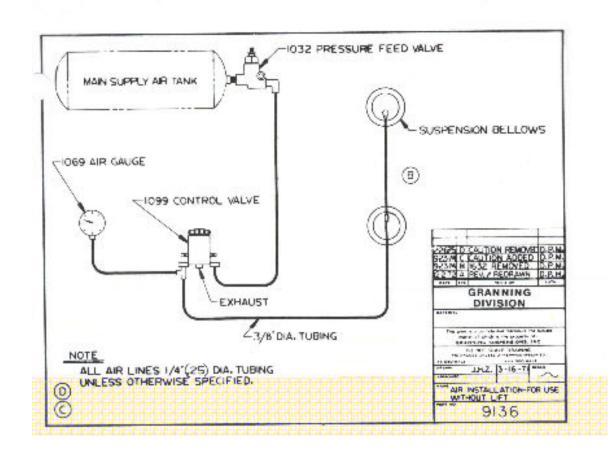


# AIR CONTROLS T-300A 4-WAY ELECTRICAL AIR CONTROL





# AIR CONTROLS FOR ALL T-SERIES SUSPENSION MODELS WITHOUT LIFT





#### **TROUBLESHOOTING**

#### Air Spring Problems

Note: If loss of air exists in air suspensions system, there is an internal rubber bumper built into the air spring, which makes it possible to operate vehicle to a service center. Turn handle valve to (-MINUS) position (0 psi) and proceed carefully to the nearest service center.

**CAUTION:** DO NOT OVERLOAD AXLES.

Problem	Possible Remedy
Insufficient air pressure to suspension.	Build vehicle air pressure in excess of
	65 psi. Defective pressure protection
	valve replace. Check air compressor.
Air leak or damaged line.	Locate and repair.
Air spring punctured, cut or leaking.	Replace with proper air spring then
	check for proper clearance around air
	spring. 1" minimum at 100 psi
	maximum pressure.
Tires or rim rubbing air spring.	Use rim back spacers to provide more
	clearance.
Air brake chamber rubbing frame or	Relocate chamber or clamp ring for
drive shaft.	more clearance.



## **TROUBLESHOOTING**

Repaired Shock Absorber Failures			
Problem	Possible Remedy		
Over extending shock absorbers.	Inspect for bent or broken rear guide		
	bottom plate. Replace as required.		
	Wrong length or improper shock		
	absorber(s). Replace with proper		
	part(s).		

Axle Alignment		
Problem Possible Remedy		
Improperly aligned axle.	Inspect for worn bushings, loose clamping bolts, and worn guide block. Replace as necessary.	

Insufficient Lifted Tire Clearance			
Problem Possible Remedy			
Excessive drive axle spring deflection.	Add spring leaves as required.		
Misadjusted lift mechanism.	Adjust to specification. Refer to installation instructions or air lift inspection (See Page 9).		

Axle Alignment			
Problem	Possible Remedy		
Axle bottoms out on lift cables.	Lift cable nuts improperly adjusted		
	(See Page 9).		
	Debris under lift dome. Keep area		
	cleaned. Note: When build-up of		
	debris, such as ice or snow, is a		
	problem, a protective cover may be		
	required.		



#### REPLACEMENT INSTRUCTIONS

#### AIR SPRING ASSEMBLY

- 1. Remove load; vehicle with mechanical suspension will maintain proper clearance for removal of air spring. If air suspension is not combined with a mechanical suspension or load is not removed, then adequate jacks or stand must be used to support vehicle frame.
- 2. Disconnect air supply line from top of air spring.
- 3. Remove fasteners and old air spring assembly.
- 4. Install new air spring assembly and properly torque fasteners. Fasteners should be installed in a diagonal fashion top and bottom. Then reconnect air supply line.

**CAUTION:** 100 PSI IS MAXIMUM ALLOWABLE OPERATING AIR PRESSURE.

#### SHOCK ABSORBERS

- 1. Position tractor frame at approximate suspension ride height to relieve all tension on shock absorbers.
- 2. Remove upper and lower shock mounting bolts.
- Install new shocks and reinstall mounting bolts.
- 4. Torque fasteners to 200 ft. lbs.

#### FRONT TORQUE BUSHING

- 1. Exhaust air from suspension.
- 2. Support front drawbar with jack stand.
- 3. Remove the ¾" bolt.
- 4. The end bearings are tapered into the torque bushing inner sleeve. Once the (6) 5/8" bolts are removed from the end bearing caps, a slight rap with a hammer will free the tapered end of the inner bushing sleeve.
- 5. Loosen (2) ½" clamp bolts from underside of drawbar and insert wedge. Push the old bushing out and install new bushing.
- 6. Reverse this procedure assuring the ¾" bolt is torqued securely, then torque the (6) 5/8" end bearing bolts (See Torque Chart Page 7).



#### REPLACEMENT INSTRUCTIONS

#### **REAR GUIDE BLOCK**

1. Jack axle up to approximately normal ride height with air exhausted. Remove rear snap ring and spacer from rear guide spindle. Remove guide block by sliding rearward and install new block in reverse procedure.

#### **AXLE LIFT AIR BELLOWS**

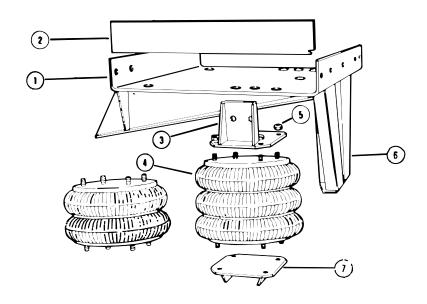
- 1. Exhaust air from suspension.
- 2. Remove bellow mounting bolts and air fitting.
- 3. Remove 2 lower pins holding lift cables (NOTE: Do not remove upper adjusting nuts. If nuts are removed, see air lift inspection data, Page 9).
- 4. Raise lift bellow steel dome and remove air spring.
- 5. Replace with new bellow and reverse procedure, assuring that cotter keys are replaced in lower pin assemblies.

**CAUTION:** INSPECTION SHOULD BE PERFORMED BY A QUALIFIED MECHANIC OR REYCOGRANNING® SUSPENSIONS SERVICE CENTER.

\*USE REYCOGRANNING® SUSPENSIONS ORIGINAL APPROVED PARTS ONLY.



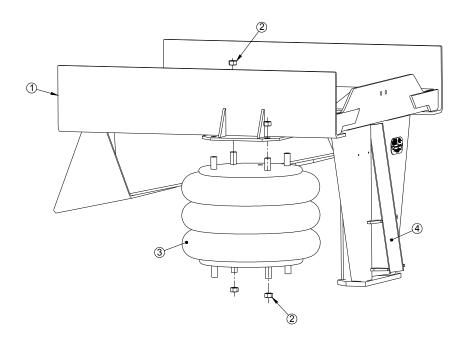
# SUSPENSION COMPONENTS FRAME ASSEMBLY T-200AX SERIES



ITEM	T-200A	T-200AX	QTY	DESCRIPTION
1	2699	2202	1	Assy-Base Frame
2	1068	1068	2	Angle-Side
3	1279	1279	2	Assy-Air Spring Pad Upper
4	1014	1014	2	Assy-Air Spring
5	8120378	8120378	9	Nut-Hex 1/2-13 GR 5
6	1449	1449	2	Plate-Wear
7	1012		2	Assy-Air Spring Pad Lower



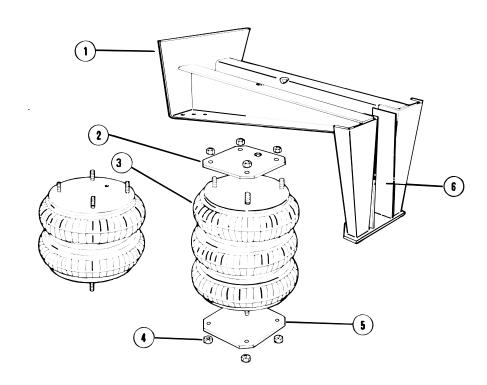
# SUSPENSION COMPONENTS FRAME ASSEMBLY T-200AM SERIES



ITEM	T-200AM	QTY	DESCRIPTION
1	704997-01	1	Assy-Base Frame
2	8120378	8	Nut 1/2-13 GR 5 ZP
3	1014	2	Air Spring Assembly
4	1449	2	Wear Plate



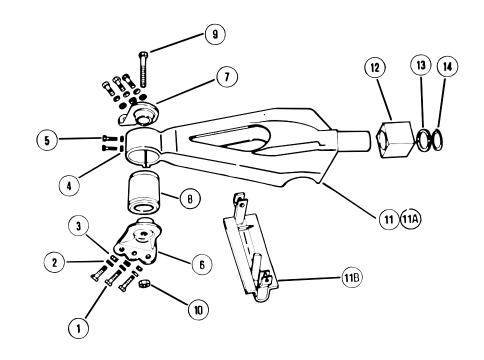
# SUSPENSION COMPONENTS FRAME ASSEMBLY T-300A SERIES



ITEM	T-300A-1	T-300A-2	QTY	DESCRIPTION
1	1471	1471	1	Assy-Base Frame
2	1144	1615	2	Assy-Air Spring Pad Upper
3	1015	1626	2	Assy-Air Spring
4	8120378		9	Nut-Hex 1/2-13 GR 5
4		180121	8	Bolt-Hex Hd 3/8-16 x 7/8 GR 5
4		103321	8	Washer-3/8 Spring Lock
5	1012	1612	2	Assy-Air Spring Pad Lower
6	1254	1254	2	Plate-Wear



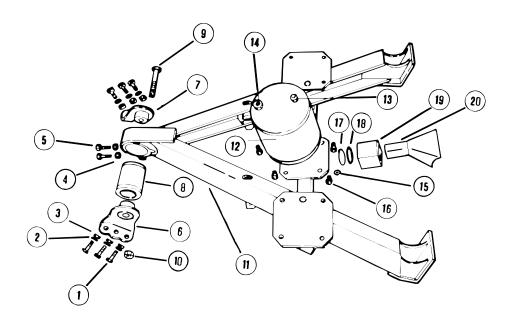
# SUSPENSION COMPONENTS DRAWBAR (ALL EXCEPT T-200AX and T-200AM)



ITEM	T-300A	T-200A	QTY	DESCRIPTION
1	223811	223811	6	Bolt-Hex Hd 5/8-18 x 2 GR 8
2	9422850	9422850	6	Washer-5/8 Flat Harden
3	9422306	9422306	6	Nut-Hex 5/8-18 Lock GR 8
4	9422302	9422302	2	Nut-Hex ½-20 Lock GR 8
5	427569	427569	2	Bolt-Hex Hd ½-20 x 1-3/4 GR 8
6	1029	1029	1	Anchor Pulling Point LH
7	1005	1005	1	Anchor-Pulling Point RH
8	1003	1003	1	Bushing-Pulling Point
9	9418372	9418372	1	Bolt Hex Hd 3/4-16 x 7 GR 8
10	9422308	9422308	1	Nut-Hex 3/4-16 Lock GR 8
11	1430	1430	1	Assy-Drawbar
11A		1432	1	Assy-Drawbar (pre 1978)
11B	1879	1879	1	Bracket-Lift
12	1219	1219	1	Block-Travel
13	1010	1010	1	Spacer-Travel Block
14	1426	1426	1	Ring-Snap



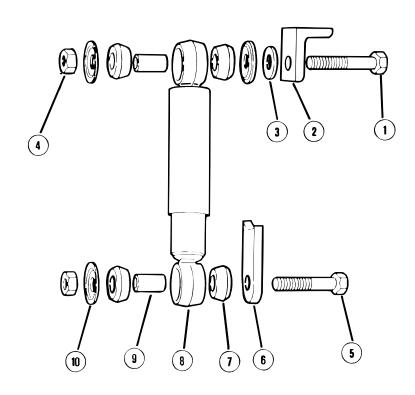
# SUSPENSION COMPONENTS DRAWBAR T-200AX and T200AM (12,000-16,000 CAPACITY MODELS)



ITEM	T-200 (AX and AM)-12	T-200 (AX and AM)-16	QTY	DESCRIPTION	
1	223811	223811	6	Bolt-Hex Hd 5/8-18 x 2 GR 8	
2	9422850	9422850	6	Washer-5/8 Flat Harden	
3	9422306	9422306	6	Nut-Hex 5/8-18 Lock GR 8	
4	9422302	9422302	2	Nut-Hex 1/2-20 Lock GR 8	
5	427569	427569	2	Bolt-Hex Hd 1/2-20 x 1-3/4 GR 8	
6	1029	1029	1	Anchor Pulling Point LH	
7	1005	1005	1	Anchor-Pulling Point RH	
8	1003	1003	1	Bushing-Pulling Point	
9	9418372	9418372	1	Bolt Hex Hd 3/4-16 x 7 GR 8	
10	9422308	9422308	1	Nut-Hex 3/4-16 Lock GR 8	
11	1388	1388	1 Assy-Drawbar		
12		1359	1	Assy-Air Spring	
13		8120378	1	Nut-Hex 1/2-13 GR 5	
14		219758	1	Nut-Hex ¾-16 Jam GR 5	
15		1032323	2	Washer-1/2 Spring Lock	
16		8180175	2	Bolt-Hex Hd 1/2-13 x 1-1/4 GR 5	
17	1426	1426	1	Ring-Snap	
18	1010	1010	1	Spacer-Travel Block	
19	1219	1219	1	Block-Travel	
20	1118	1118	1	Spindle-Rear	



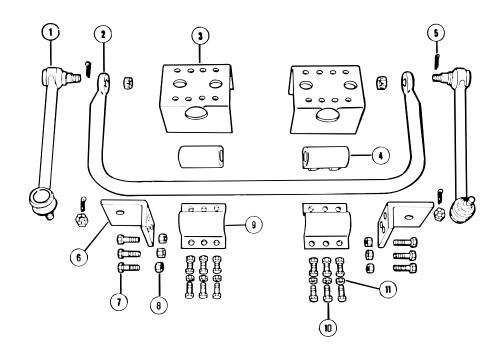
# SUSPENSION COMPONENTS SHOCK ABSORBERS (T-200A and T300A SERIES)



ITEM	T-200A	T-300A	QTY	DESCRIPTION
1	271803	271803	2	Bolt-Hex Hd 3/4-16 x 4-1/2 GR 5
2		1520	2	Bracket-Frame Shock
3		1094	2	Spacer-Shock
3	1094		4	Spacer-Shock
4	9422288		2	Nut-Hex 3/4-16 Lock GR 5
4		9422288	4	Nut-Hex 3/4-16 Lock GR 5
5	271799	271799	2 Bolt-Hex Hd ¾-16 x 3-½ GR 5	
6	2556	2556	2	Bracket-Axle Shock
7	1089	1089	8	Bushing-Rubber
8	1086	1086	2	Absorber-Shock
9	1087	1087	4	Sleeve-Bushing
10	1088	1088	6	Washer-Retainer



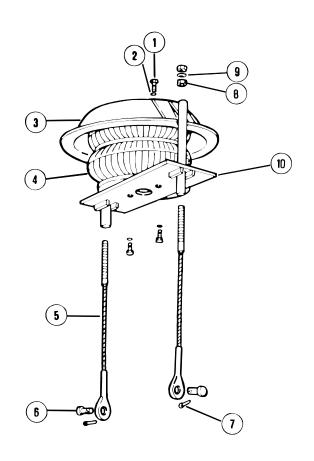
# SUSPENSION COMPONENTS STABILIZER BAR T-103S



ITEM	T-103S-2 (T-300A)	QTY	DESCRIPTION
1	1594	2	Vertical Link Assy 15" Long
2	1949	1	Stabilizer Bar
3	1288	1	Stabilizer Bar (pre 1976)
3	1954	2	Assy-Mounting Bracket
4	1290	2	Assy-Mounting Bracket (pre 1976)
4	1952	2	Bushing
5	1361	2	Bushing (pre 1976)
6	103389	4	Cotter Pin 1/8 x 2.00
7	1593	2	Assy-Angle Bracket
8	1951	2	Clamp-Stabilizer
9	1273	2	Clamp-Stabilizer (pre 1976)
10	455012	12	Bolt-Hex Hd ½-20 x 1-1/4 GR 5
11	941758	12	Nut-Hex 1-1/2 2-20 Lock GR 5



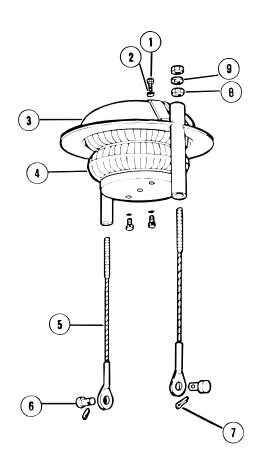
# SUSPENSION COMPONENTS AIR LIFT ASSEMBLY T-502L-1 (T-300A SERIES)



ITEM	T-502L-1	QTY	DESCRIPTION
1	180121	4	Bolt-Hex Hd 3/8-16 x 7/8 GR 5
2	103321	4	Washer-3/8 Spring Lock
3	1390	1	Assy-Lift Dome
4	1218	1	Assy-Air Spring
5	1883	2	Assy-Lift Cable
6	1235	2	Pin-Lift Cable
7	103408	2	Pin-3/16 x 1-1/4 Cotter
8	451539	4	Nut-Hex ¾-10 Jam GR 5
9	1595	2	Washer-"D"
10	1387	1	Assy-Plate



# SUSPENSION COMPONENTS AIR LIFT ASSEMBLY T-502L-5 (T-200AX and T-200AM SERIES)



ITEM	T-502L-5	QTY	DESCRIPTION
1	180121	4	Bolt-Hex Hd 3/8-16 x 7/8 GR 5
2	103321	4	Washer-3/8 Spring Lock
3	1390	1	Assy-Lift Dome
4	1218	1	Assy-Air Spring
5	1883	2	Assy-Lift Cable
6	1235	2	Pin-Lift Cable
7	103408	2	Pin-3/16 x 1-1/4 Cotter
8	451539	4	Nut-Hex ¾-10 Jam GR 5
9	1595	2	Washer-"D"



# MAINTENANCE RECORD

Vehicle No
Vehicle Serial No.
Suspension Model No
Suspension Serial No.
Date first put in service:

		Torqued N Insp	Nuts and ect	Parts	
Date	Mileage	Pivot	Axle Conn.	Replaced	Misc.



# NOTES

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#### **Warranty**

ReycoGranning® Suspensions warrants its suspensions (other than R-Series suspensions) to be free from defects in material and workmanship under normal use and service in the U.S. and Canada as follows:

Main Structural Components -- 36 months or 300,000 miles, whichever occurs first. Labor allowance is provided for 12 months or 100,000 miles, whichever occurs first. Labor will be allowed on ReycoGranning® Suspensions estimated time to make repairs at a maximum rate of \$50.00 per hour. Main structural components are defined as: hangers, beams, torque arms, axle saddles, clip plates, bellows pads - excludes bushings and fasteners.

Other Air Suspension Components -- 12 months or 100,000 miles, whichever occurs first -valves, fasteners, bushings, and other components not stated specifically (when provided by ReycoGranning® Suspensions), and other fabricated metal components. ReycoGranning® Suspensions provides no warranties on components such as axles, air springs, controls, 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.

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 trailer owner's manual or instructions. Labor allowance, if applicable, will be determined in accordance with ReycoGranning® Suspensions warranty labor rate and time allowances established from time to time.

#### **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 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 trailer 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.

2/2002