

Retain This Manual
for Future Reference

TANDEM AXLE RUBBER SUSPENSION SYSTEM

Suspension Codes: T01-01; Standard Tandem
L01-01; LITE/ryde Tandem

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SECTION I

DESCRIPTION

The MOR/ryde Tandem Axle Rubber Suspension System is a unique and technologically advanced suspension. The uniqueness of the MOR/ryde tandem axle suspension is in its:

1. 100% Natural Rubber Springs
2. Wider Spring Centers
3. Frame Attachment Between the Tandem Wheels Without a Slip Joint
4. Walking Beam Which Serves as a Mechanical Link Between the Tandem Axles

The MOR/ryde tandem axle suspension with its rubber springs provides three (3) distinct advantages:

1. Improved Braking
2. Improved Tire Life
3. Improved Towability

Routine preventive maintenance is critical to insure a MOR/ryde suspension will provide thousands of safe and trouble-free miles of performance. This Service Manual will provide information regarding routine maintenance and service instructions.

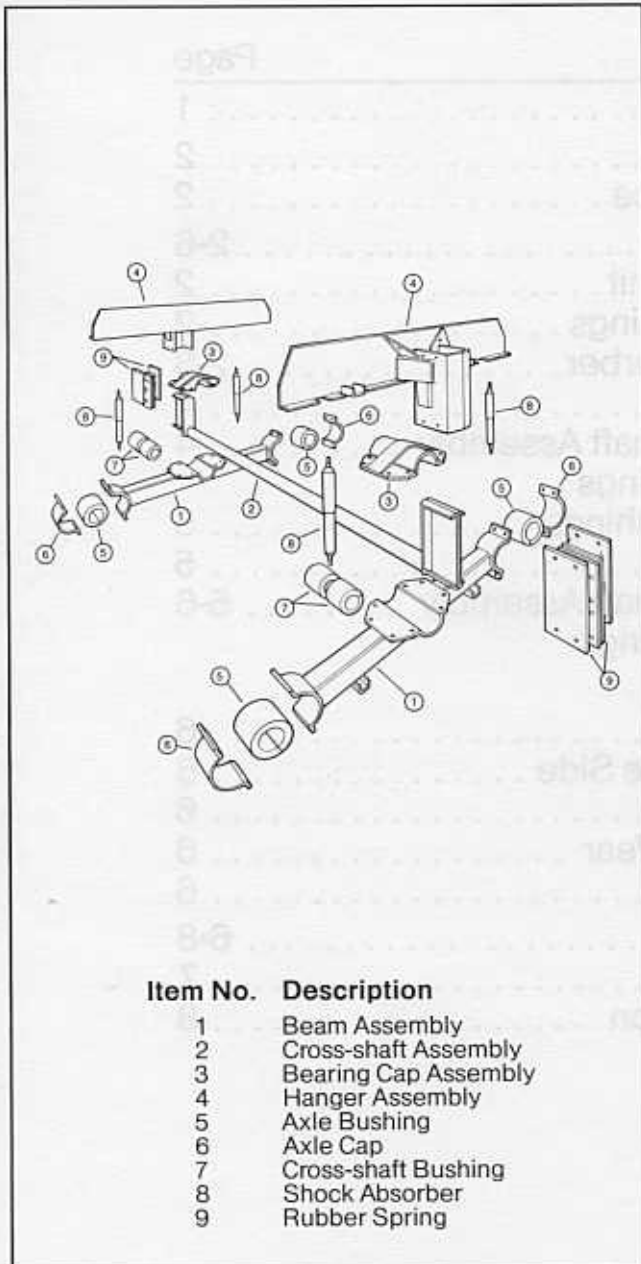


Figure 1 — MOR/ryde Tandem Suspension System (Part No. T01-01)

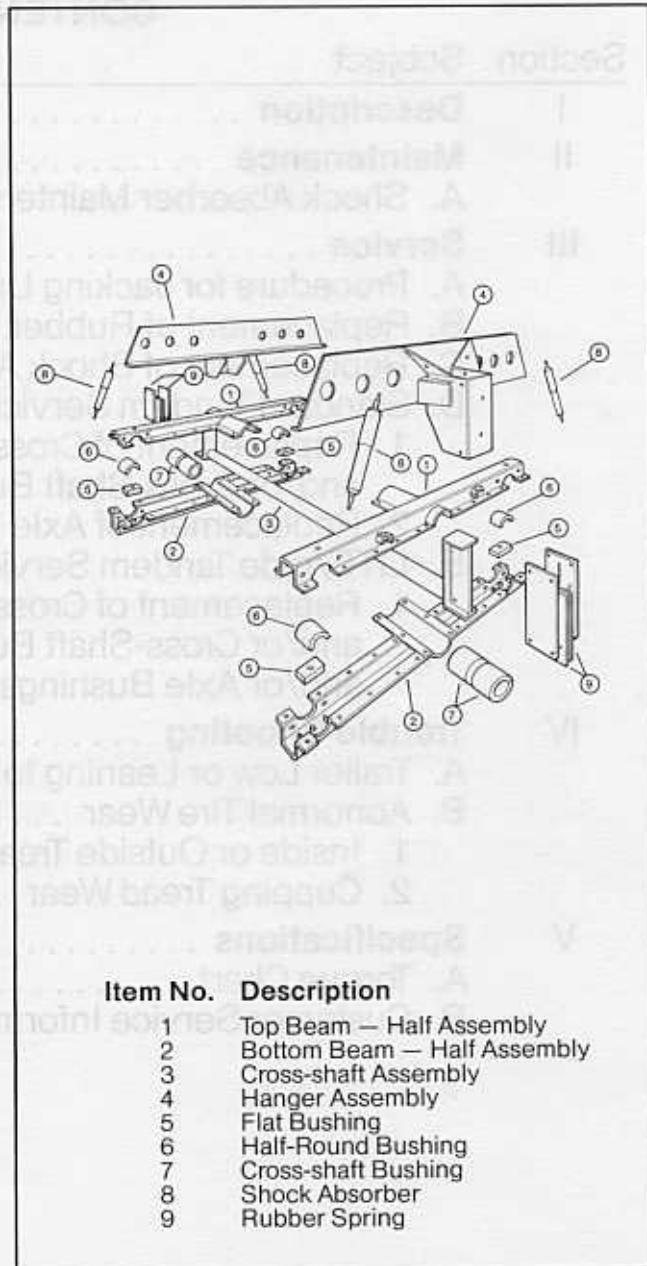


Figure 2 — Lite/ryde Tandem Suspension System (Part No. L01-01)

SECTION II

MAINTENANCE

Since the MOR/ryde Tandem Axle Suspension requires no lubrication, maintenance is limited to periodic inspections to insure all rubber bushings and rubber springs are intact.

II-A. SHOCK ABSORBER MAINTENANCE

The shock absorbers used on the MOR/ryde rubber

suspension are of the sealed, hydraulic type and require no periodic maintenance. Shock absorbers of this type should be checked every 10,000 miles to make sure they are functioning satisfactorily, bushings are not worn, and the dust cover has not been damaged by flying stones or debris from the road. If a shock absorber is leaking, fails to operate, or develops an unusual noise, the complete unit should be replaced. See Section III-D. for replacement procedure.

SECTION III

SERVICE

NOTE:

ALL SERVICE PROCEDURES MUST BE PERFORMED WITH THE VEHICLE SUPPORTED AT THE FRAME WITH SAFETY STANDS AND THE SUSPENSION HANGING UNSUPPORTED.

III-A. PROCEDURE FOR JACKING UP UNIT

It is permissible to jack up a unit equipped with a MOR/ryde tandem axle suspension any place except on the tube of the cross-shaft. **DO NOT JACK UP ON THE SUSPENSION'S CENTER CROSS-SHAFT TUBE.** Jacking on the cross-shaft tube will cause the tube to bend. The most efficient location to raise a unit is either at the frame or on the ends of the cross-shaft where the rubber springs are attached.

III-B. REPLACEMENT OF RUBBER SPRINGS

MOR/ryde rubber springs are made of a special formulation of natural rubber. The rubber springs are vulcanized (bonded) to steel plates. There are two (2) unlikely problems that may occur with MOR/ryde rubber springs:

1. The first type is a bond failure. This condition is apparent when the rubber separates from the metal plate.
2. The second type is a rubber failure. This condition is apparent when the rubber tears or delaminates and generally occurs in the middle of the rubber spring between the metal plates.

Either of the conditions described above would not always necessitate replacement of the rubber spring. If there is a question about the integrity of a marginal rubber spring, a 3" wide object (such as a 3" putty knife) can be used to probe the rubber spring in the affected area. If the probe penetrates the crack or separated

area .75 inch or more, the spring should be replaced.

To replace a rubber spring:

1. Make sure unit is elevated 13-14 inches, the frame is supported with safety stands and the suspension is hanging unsupported.
2. Remove both tires on the side of the unit the rubber springs are to be replaced.
3. Disconnect bottom of shock absorbers from walking beams.
4. Loosen brake wires to obtain slack.
5. Remove 3/8" bolts securing rubber springs to frame hanger assembly.
6. Pry rubber springs and suspension out of frame hanger assembly down to ground so rubber springs are completely exposed.
7. Remove 3/8" bolt attaching rubber springs to cross-shaft end. Rubber springs can now be removed.
8. Install new rubber springs in cross-shaft end.
9. Jack suspension up and into frame hanger assembly until rubber spring bolt holes are aligned and attach with 3/8" nuts and bolts.
10. Reattach brake wires to remove slack.
11. Reattach bottom of shock absorbers to walking beam.
12. Reinstall tires and remove jack stands.

III-C. REPLACEMENT OF SHOCK ABSORBER

There are four (4) shock absorbers utilized on the MOR/ryde tandem axle suspension system. These shock absorbers are made by Monroe with special valving and stroke length specifically designed for the MOR/ryde suspension and are **not** available through any Monroe aftermarket dealers. Consult MOR/ryde, Inc. direct for replacements. Refer to Figure 3.

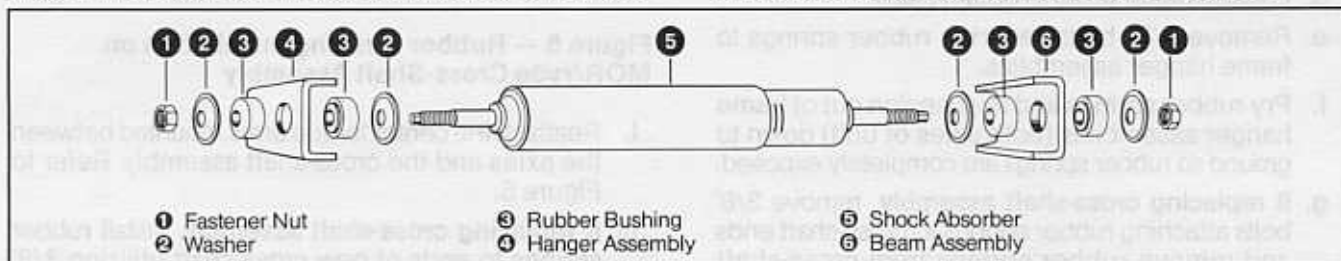


Figure 3 — Shock Absorber and Shock Fasteners

SECTION III

To replace a shock absorber:

1. Remove fasteners.
2. Remove shock absorber.
3. Install new bushings on new shock absorber per exploded illustration.
4. Install new shock absorber.
5. Torque fasteners per Torque Chart in Specification Section.

III-D. STANDARD TANDEM SERVICE

1. Replacement of Cross-Shaft Assembly and/or Cross-Shaft Bushings

The cross-shaft assembly utilized on the MOR/ryde tandem axle suspension acts as the fulcrum for the walking beam assemblies and supports one vertical side of the rubber springs located between the two (2) axles. Refer to Figure 4. The cross-shaft attachment to the walking beams is insulated through rubber bushings.

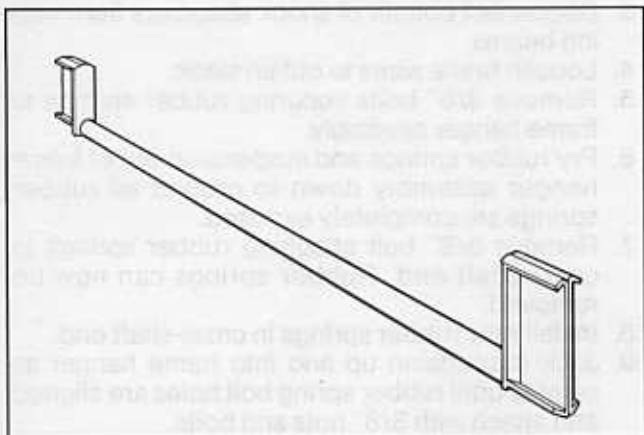


Figure 4 – MOR/ryde Tandem Cross-Shaft Assembly

To replace a cross-shaft assembly and/or cross-shaft bushings:

- a. Make sure unit is elevated 13-14 inches, the frame is supported with safety stands and the suspension is hanging unsupported.
- b. Remove tires.
- c. Disconnect bottom of shock absorbers from walking beams.
- d. Loosen brake wires to obtain slack.
- e. Remove 3/8" bolts securing rubber springs to frame hanger assemblies.
- f. Pry rubber springs and suspension out of frame hanger assemblies (both sides of unit) down to ground so rubber springs are completely exposed.
- g. **If replacing cross-shaft assembly**, remove 3/8" bolts attaching rubber springs to cross-shaft ends and remove rubber springs from cross-shaft assembly.

- h. **If replacing cross-shaft assembly**, disconnect center torque arms mounted between the axles and the cross-shaft assembly. Refer to Figure 5.

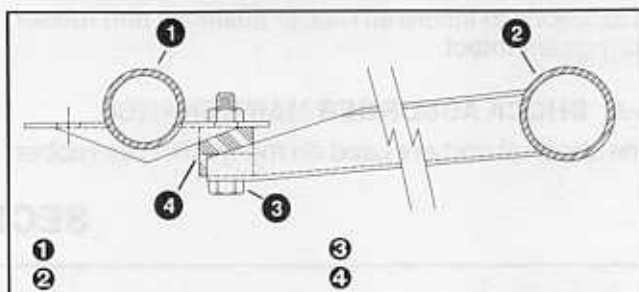


Figure 5 – Center Torque Arm Attachment to Cross-Shaft Assembly

- i. Remove 1/2" bolts in bearing cap assemblies which secure cross-shaft assembly to beam assemblies.
- j. Cross-shaft assembly and/or cross-shaft bushings can now be removed.
- k. Put new cross-shaft assembly and/or new cross-shaft bushings in place. Before tightening bearing cap assemblies, make sure cross-shaft bushings are properly located with seams aligned horizontally with mating surface of bearing cap assemblies. Refer to Figure 6.

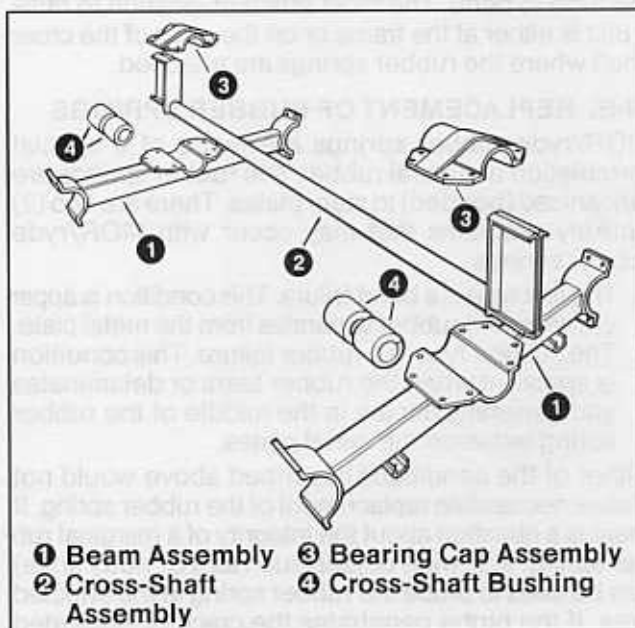


Figure 6 – Rubber Bushing Installation on MOR/ryde Cross-Shaft Assembly

- l. Reattach the center torque arms mounted between the axles and the cross-shaft assembly. Refer to Figure 5.
- m. **If replacing cross-shaft assembly**, install rubber springs to ends of new cross-shaft utilizing 3/8" nuts and bolts.

SECTION III

- n. Jack suspension assembly up and into frame hanger assemblies until bolt holes are aligned and attach with 3/8" nuts and bolts.
- o. Reattach brake wires to remove slack.
- p. Reattach bottom of shock absorbers to walking beams.
- q. Reinstall tires and remove jack stands.

2. Replacement of Axle Bushings

- a. Elevate unit at frame until tires are just off ground and support frame with safety stands.
- b. Do **not** remove tires.
- c. Disconnect center torque arms mounted between the axles and the cross-shaft assembly. Refer to Figure 5.
- d. Remove 1/2" bolts attaching axles to beam assemblies through axle caps. Refer to Figure 7.
- e. Carefully roll axles away from suspension until axle bushings are exposed.
- f. Remove old axle bushings and install new ones making sure seams of rubber bushings are pointed **down** in line with seams of axle caps.
- g. Roll axles back in place and utilizing 1/2" nuts and bolts attach axles to beam assemblies through axle caps. Refer to Figure 7.

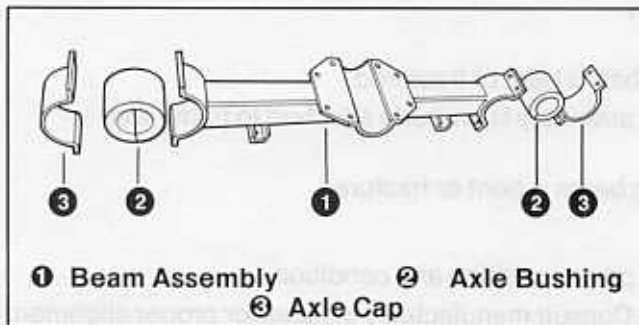


Figure 7 — Rubber Axle Bushing Installation on MOR/ryde Beam Assembly

- h. Reattach the center torque arms mounted between the axles and the cross-shaft assembly. Refer to Figure 5.
- i. Remove jack stands.

III-E. LITE/ryde TANDEM SERVICE

1. Replacement of Cross-Shaft Assembly and/or Cross-Shaft Bushings and/or Axle Bushings

The cross-shaft assembly utilized on the LITE/ryde tandem axle suspension acts as the fulcrum for the walking beam assemblies and supports one side of the rubber springs located between the two (2) axles. Refer to Figure 8. The cross-shaft axle attachments to the walking beams are insulated through rubber bushings. Refer to Figure 9.

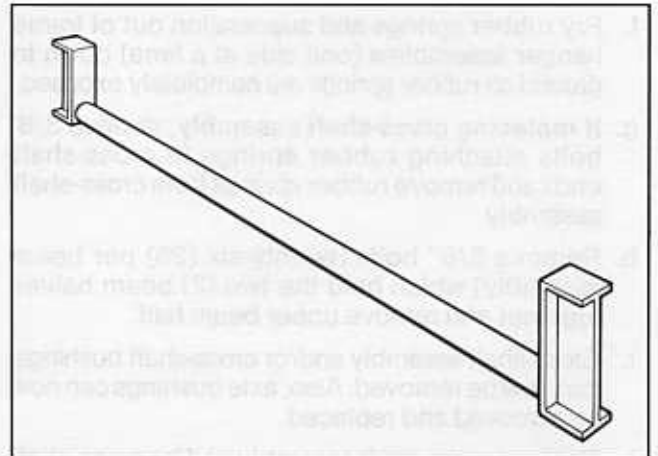


Figure 8 — LITE/ryde Tandem Cross-Shaft Assembly

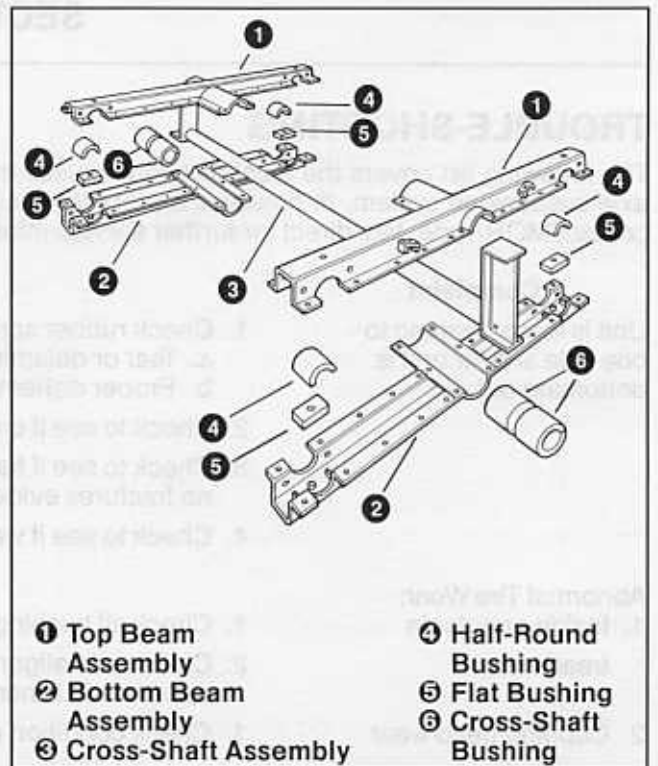


Figure 9 — LITE/ryde Beam, Cross-Shaft and Bushing Assemblies

To replace a cross-shaft assembly and/or cross-shaft bushings and/or axle bushings:

- a. Make sure unit is elevated 13-14 inches, the frame is supported with safety stands and the suspension is hanging unsupported.
- b. Remove tires.
- c. Disconnect bottom of shock absorbers from walking beams.
- d. Loosen brake wires to obtain slack.
- e. Remove 3/8" bolts securing rubber springs to frame hanger assemblies.

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- f. Pry rubber springs and suspension out of frame hanger assemblies (one side at a time) down to ground so rubber springs are completely exposed.
- g. **If replacing cross-shaft assembly**, remove 3/8" bolts attaching rubber springs to cross-shaft ends and remove rubber springs from cross-shaft assembly.
- h. Remove 3/8" bolts [twenty-six (26) per beam assembly] which hold the two (2) beam halves together and remove upper beam half.
- i. Cross-shaft assembly and/or cross-shaft bushings can now be removed. Also, axle bushings can now be removed and replaced.
- j. Replace cross-shaft assembly and/or cross-shaft bushings. Before putting beam halves together, make sure cross-shaft bushings are properly located with seams aligned horizontally with mating surfaces of beam halves. Refer to Figure 9.
- k. **If replacing cross-shaft assembly**, install rubber springs to ends of new cross-shaft utilizing 3/8" nuts and bolts.
- l. Jack suspension up and into frame hanger assemblies until rubber spring bolt holes are aligned and attach with 3/8" nuts and bolts.
- m. Reattach brake wires to remove slack.
- n. Reattach bottom of shock absorbers to walking beams.
- o. Reinstall tires and remove jack stands.

SECTION IV

TROUBLE-SHOOTING

The following list covers the most frequent causes for complaints which may occur in the MOR/ryde tandem axle suspension system. If, however, a problem occurs that is not addressed here, please do not hesitate to contact MOR/ryde, Inc. direct for further service information.

Complaint	Possible Cause
Unit is low or leaning to one side and/or unit is bottoming out	<ol style="list-style-type: none">1. Check rubber springs for:<ol style="list-style-type: none">a. Tear or delaminationb. Proper deflection2. Check to see if cross-shaft is bent or fractured.3. Check to see if hanger assembly is properly attached to frame with no fractures evident.4. Check to see if walking beam is bent or fractured.
Abnormal Tire Wear: 1. Inside or outside tread wear	<ol style="list-style-type: none">1. Check all bushings for proper position and condition.2. Check axle alignment. Consult manufacturer of axles for proper alignment specs and further axle service information.
2. Cupping tread wear	<ol style="list-style-type: none">1. Check condition of shock absorbers.

SECTION V

SPECIFICATIONS

TORQUE CHART

USE THESE TORQUE VALUES UNLESS OTHERWISE SPECIFIED ON PRINT.

<u>Bolt Size</u>	<u>Torque Ft. Lbs.</u>	
	<u>Grade 5</u>	<u>Grade 8</u>
3/8"	24	35
7/16"	30	45
1/2"	45	69
5/8"	90	135
3/4"	150	222
7/8"	227	355

U-Bolts

5/8"	—	150
3/4"	150	225

Note: Torque values must be verified with a torque wrench. A calibrated pneumatic impact wrench is not an acceptable substitute.

MERCHANDISE RETURNS

All goods to be returned to MOR/ryde, Inc. must have a return authorization number assigned prior to their being returned. This will enable MOR/ryde to have better control of parts being returned for replacement or credit.

A return authorization form will be sent out with any parts that are ordered for warranty replacement. In the event that new parts are not sent but there is a need to return parts, please provide MOR/ryde with the proper information before returning the parts. A return authorization form will be mailed to accompany the parts to be returned.

Returned parts, such as rubber springs, are tested in the MOR/ryde laboratory upon their receipt. If, after testing, the parts are determined not to be defective, they will be returned to the customer, freight collect, and credit will not be issued.

All return authorizations will be void after 60 days from the date of issue and the account **will be debited** accordingly.

CUSTOMER SERVICE

If you have any questions about servicing the MOR/ryde Rubber Suspension system or wish to order parts, please call the MOR/ryde Customer Service Department. You may telephone (574) 293-1581 between 8:00 a.m. to 4:30 p.m. EST, Monday through Friday.