

**SERVICE MANUAL**  
**FOR**  
**ENIDINE UNIVERSAL HD & HDA UNITS**

**Date: 11 JAN 00**

### IMPORTANT NOTES:

- ENIDINE recommends service/repair to be done at the factory for all units with stroke lengths of 12 inches (300 mm) or greater. Contact ENIDINE Sales Department for return authorization.
- All repairs to be done by factory authorized individuals.
- Read all instructions prior to any service to unit.
- The customer assumes the responsibility for any and all damages or injury incurred by improper assembly or disassembly of these units.

### INSTALLATION INSTRUCTIONS:

- The shock absorber should always be mounted with the fill port up.
- Proper installation requires support at both front and rear flanges for strokes greater than 12 inches (300 mm).
- Provide a positive stop at 1/8 inch (3 mm) before full stroke to prevent internal bottoming of the unit.
- *Side load condition* – This should not exceed 5° up to a stroke of 10 inches (250 mm) and 1° for stroke lengths above 10 inches (250 mm).
- Cylinder temperature should not exceed 150°F (65°C).

### GENERAL MAINTENANCE:

It is recommended that a preventative maintenance program be established to obtain optimum life from the shock absorber. Routine inspection (every six {6} months) should include the following:

1. Inspect for detrimental oil leakage around seals.
2. Performance of unit in application.
3. During long periods of inactivity (once every six {6} months), it is recommended that the units be cycled manually (by hand or using the driving load) to lubricate seals and assure proper unit function. Complete piston rod return indicates the bladder is sufficiently pressurized. It is not necessary to check the actual bladder pressure unless the piston rod does not fully return.

\* If malfunction is detected, replace with spare and/or repair the defective unit.

## FIELD REPAIR DISASSEMBLY INSTRUCTIONS

1. Refer to the exploded assembly drawing in this manual for reference purposes When disassembling or assembling the unit.
2. Remove protective cap (16) and valve cap (15) to access charging valve.  
**CAUTION: DEPRESSURIZE UNIT BEFORE ATTEMPTING TO DISASSEMBLE ANY PORTION OF THE UNIT.** This can be accomplished by depressing the needle of the valve core or by completely removing the valve core from the valve stem to discharge air from the bladder accumulator. To make sure all the air has been discharged, compress the piston rod fully while the valve is removed or depressed. If the piston rod does not remain compressed, the unit is not fully discharged. If the unit does not discharge, remove the valve core from the valve stem and let sit. If after 3 – 5 hours, the unit is still not completely discharged, return it to the factory for repair.
3. After depressurizing, remove fill plug (11) and drain oil from unit.
4. *For HDA Units:*  
Remove the security pin (6) from the rear flange (7). Remove the small screw (35) near the adjustment screw, and remove the adjustment screw (2) completely. Remove the O-ring (4) and backup ring (3) on the adjustment screw (2).
5. Remove all the set screws (8) from both flanges. You will find 3 of these screws on the sides of each flange and one screw (28) on the front of the lock ring.
6. Remove lock ring (27) and front flange (26). If unit has no front flange there will be a spacer (26) that will have to be removed.
7. *For HDA Units:*  
Remove the positive stop (29) which is mounted with 2 cap screws (30) on the bearing retainer (23).
8. Turn bearing retainer (23) counter clockwise to remove bearing retainer (23), piston rod (31), piston cap (32), and piston head (21).
9. Clamp piston rod with soft jaw vise (**be sure not to damage rod**) and remove the Piston cap (32) by removing the cap screw (33). The bearing retainer can now be taken off the piston rod (31).
10. Remove the wiper (25) and rod seal (24).
11. The cylinder (10) and bladder (12) can now be pulled off the cylinder base (1).

12. Remove valve hex nut (34) and push the valve into the cylinder (10). The bladder can now be pulled out of the cylinder.
13. Remove both the O-ring (5) and the rear flange (7). If the unit has no rear flange, remove the spacer.
14. The shock tube (9) is loctited to the cylinder base (1). To loosen these parts you must heat it up to approximately 200° C. (390° F.). We do not recommend removing the shock tube (9) from the cylinder base (1) unless it is absolutely necessary.
15. If the piston ring (20) shows signs of excessive wear, it should be replaced. This is done by removing the retaining ring (18) from the piston head (21) and sliding the piston ring (20) off. It is not necessary to remove the piston head.
16. **CLEAN AND INSPECT ALL PARTS FOR WEAR!**

**RECOMMENDED TOOLS**  
**FOR HD- & HDA- UNITS**

1. Hex key wrenches size 1.5 mm – 12 mm
2. Wrench key size 10
3. Internal retaining ring pliers
4. External retaining ring pliers
5. Screwdriver
6. Soft face hammer
7. Round steel pin
8. Seal remover pick
9. Vise with soft jaws
10. Torque wrench with hex key wrench adapter
11. Socket head wrenches

It is recommended that the shock absorber be repaired in a clean area to eliminate contamination.

**TROUBLE SHOOTING GUIDE**  
**FOR HD- & HDA- UNITS**

Do not hesitate to contact ENIDINE. We will assist you with any problem pertaining to our shock absorbers.

**Problem: No shock absorption through length of stroke.**

	Probable cause	Solution
1.	Incorrectly adjusted	Re-adjust unit, follow instructions
2.	Shock absorber improperly sized for application	Re-size shock absorber to be sure proper unit was selected
3.	Excessive oil leakage at seals	Install seal kit and inspect for worn parts
4.	Improper oil	Use correct oil after consulting ENIDINE
5.	Damaged shock tube after overloading	Replace shock tube

**Problem: Piston rod does not fully return**

	Probable cause	Solution
1.	Excessive oil leakage at seals	Install seal kit and inspect for worn parts
2.	Insufficient air pressure in the bladder	Check bladder pressure and increase to max 50 psi
3.	Bladder damaged	Replace bladder

## ASSEMBLING OF HD- & HDA- UNITS

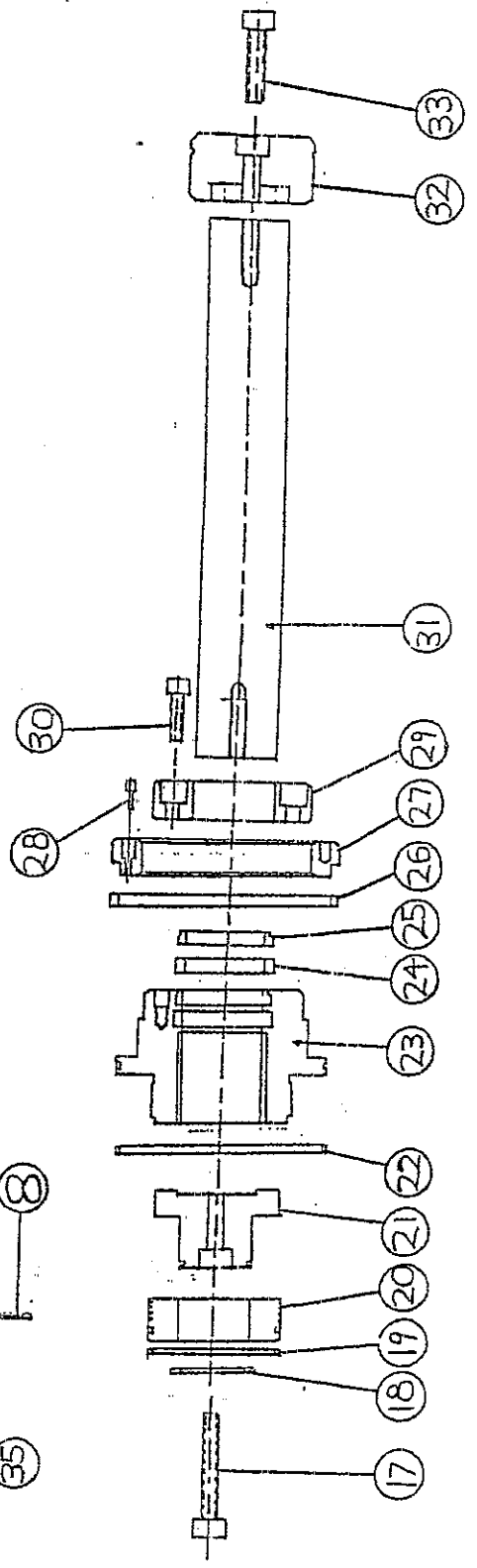
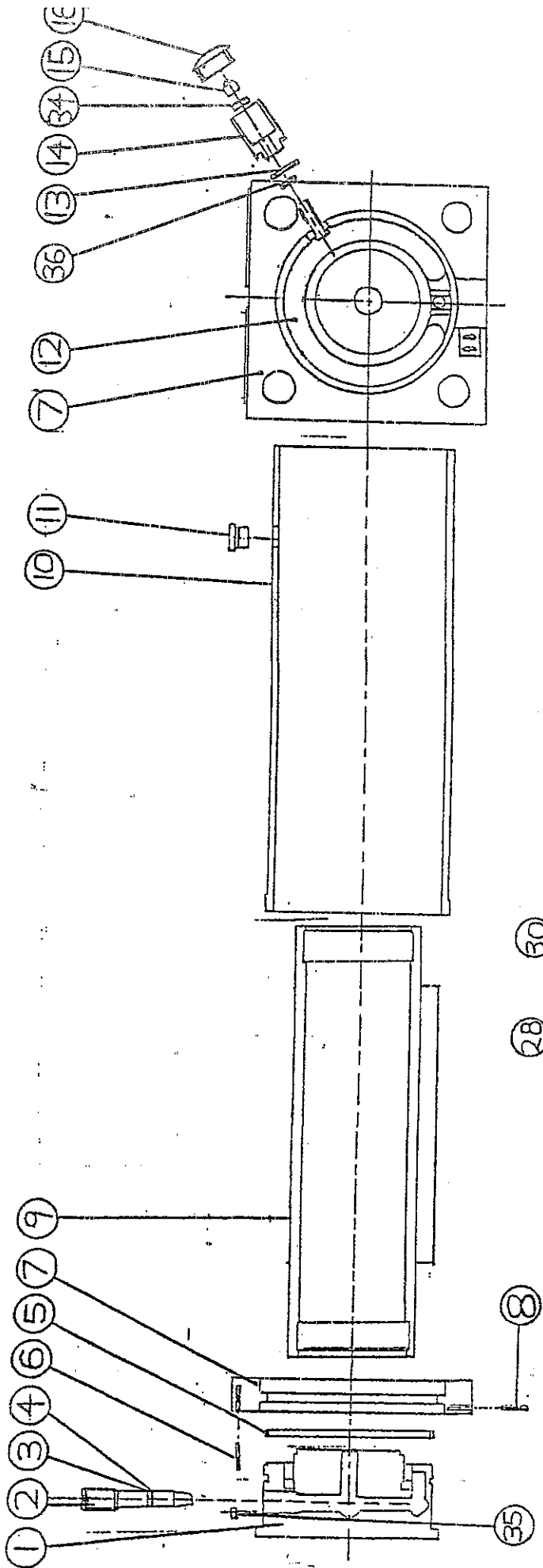
The assembling of shock absorbers should only be done in a clean area.

Before assembling unit you must clean all the parts so that you are sure that you get no dirt into the shock absorber.

1. Place Loctite on the threads of the cylinder base (1) and thread it into the end of the shock tube (9). Be sure to locate the return flow holes at the end opposite the cylinder base. The Loctite should harden for 30 minutes before you continue working with this part. HDA- orifice holes in the shock tube must be in line with the return flow hole of the cylinder base.
2. Prior to installing the bladder accumulator (12) into the cylinder (10), replace the O-ring (36) on the valve stem and apply RTV sealant to the valve stem liberally from the O-ring (36), on the nut, and downward around the valve stem base for about 1.0 inch in diameter. Push the valve stem through the charge port plug (14) making sure the bladder (12) is pushed out against the cylinder and being careful not to twist the bladder. While holding the bladder in place, install the thread seal on the valve stem and snug in place with the hex nuts (34) being careful not to twist the valve stem. **(NOTE: After bladder is secured in place, let the RTV sealant cure for six {6} hours before filling unit.)**
3. Lubricate the rod seal (24) and rod wiper (25) and insert each into the bearing retainer (23). **NOTE: Rod seal lips are to point into bearing retainer (23).**
4. Mount the piston head (21) on the piston rod (31). The screw on the piston head must be loctited.  
  
**ATTENTION: The piston head must be mounted on the piston rod side with the small chamfer (45°).**
5. Mount the cast iron piston ring (19) on the bronze piston ring (20). Place bronze piston ring (20) on the piston head (21) with the cast iron ring (19) mounted away from the piston rod (31). Secure in place with the retaining ring (18).
6. Now mount the bearing retainer (23) including the seals on the piston rod (31). For HDA- Units also put the positive stop (29) on the piston rod (31) but do not fix it to the bearing retainer (23). Loctite the piston cap screw (33) and mount the piston cap (32).
7. Mount the rear flange (7) on the cylinder base (1). Cylinder base O-ring (5) should also be installed at this time, and lubricated.

8. Position the cylinder (10) relative to the shock tube (9) such that the retaining rails on the shock tube (9) fit between the ends of the bladder (12). Slide the cylinder (10) down until seated against the rear mounting flange (7). Then secure the rear flange (7) with three {3} set screws (8) onto the cylinder (10).
9. Insert the piston rod assembly into the shock tube (9), being careful not to nick or scratch the piston ring (20) or the piston rod (31).
10. Mount the front flange to the cylinder using three {3} set screws (8). Install spacer (26) if unit has no front flange.
11. Mount the lock ring nut (27) and tighten.
12. Insert the security screw (28) into the lock ring (27) and tighten.
13. *For HDA- Units:*  
Apply backup ring (3) and O-ring (4) on the adjustment screw (2) and lubricate. The O-ring (4) should be closest to the taper on the adjustment screw (2). Turn the adjustment screw (2) into the cylinder base (1) and mount the security pin (6) and the small screw (35) to hold the adjustment screw (2) in position.
14. Move the piston rod (31) by hand from the extended to compressed position and back so you can be sure that the unit has no mechanical problems.
15. Now you can fill the shock absorber according to the filling instructions.





SEAL KIT  
ITEMS

ITEM NO	ITEM DESCRIPTION	PART NO.
4	O-ring (Adj. Screw)	
3	Backup Ring (Adj. Screw)	
25	Rod Wiper	
24	Rod Seal	Part Number is model dependent, contact ENIDINE for part numbers.
36	O-ring (Valve stem)	
20	Piston Ring (Bronze)	
5	O-ring (Cylinder Base)	
22	O-ring (Bearing Retainer)	
19	Piston Ring (Cast Iron)	