Mobility Dealer and Installing Technician

Congratulations,

You have just purchased the finest, most reliable Back-Up Steering system manufactured. We are offering a 3 year/36,000 mile manufacturer’s components warranty – see warranty pages for details. Please read and reread these instructions as improvements have been made to make your installation easier and the components last longer. If you follow the directions step by step as instructed, you will not encounter any problems and you will have a proper installation.

If you have any questions call 973-808-9709 between 8 am and 4:30 pm, Monday through Friday and ask for technical assistance.

Thank you for supporting Drive-Master Products.

Yours in mobility,

[Signature]

President
Subject: Possible OEM Line/Fitting Restrictions.

All B.U.S. except Dodge/Chrysler Caravans

Referenced Area: Any OEM molded plastic fitting or OEM metal fitting you are connecting Drive-Master Back up Steering Hoses, i.e.: OEM Power Steering Pump & OEM Power Steering Reservoir.

Action: You must look in these openings to make sure that there are no obstructions from the OEM. There must be full flow through the opening. If you find obstruction or deformity, you must use a drill bit or other tool to open the fitting for full flow.

If you do not do this, you will experience a restriction in the system. It will build pressure, and blow the reservoir can off the BUS pump. Warranty Void.

Background: Some dealers report the plastic fitting out of OEM P.S. Pump Reservoir is not fully open and must be drilled out.
DEALER WARNINGS

1. The back-up system should not be used to take the place of the factory power steering system.
2. Route all hoses to prevent rupture or chafing of back-up and factory lines and keep away from hot exhaust & manifold components.
3. Only trained and certified technicians can install Drive-Master back-up systems, otherwise the warranty will be void.
4. Do not mount back-up steering pump unit with the reservoir ports facing down towards the ground.
5. Flow sensor fittings and wires were specially checked for security prior to leaving our factory. Take care when installing not to loosen or break wires. To do so will DAMAGE FLOW SENSOR AND INVALIDATE WARRANTY. Refer to troubleshooting guide for test procedures.
6. Do not make any electrical connections that are different than the Drive-Master wiring instructions.
7. Disassembling components without prior Drive-Master notification and a valid Return Authorization (RA) in writing by a Drive-Master office liaison will void warranty, and a charge will be issued for any replacement parts. DO NOT CUT HARNESS’ WHEN REMOVING ELECTRICAL WIRING FOR RETURN-THIS WILL VOID WARRANTY!
8. 2001 through 2005 Daimler/Chrysler minivan products-Check the OEM return line from the cooler to the OEM fill reservoir to see if there is a metal restrictor in the line. This can be seen from under hood, right side of motor from reservoir. If there, remove and discard the line. Replace with the yellow push-lok hose supplied. FAILURE TO DO THIS WILL RESULT IN HOSE FAILURE AT THE COOLER END AND VOID THE WARRANTY!
9. Drive-Master does not have a labor reimbursement program. So, if you cannot diagnose the problem in 15 minutes, do not waste any more time and phone for technical assistance. (973) 808-9709 Mon. - Fri. 8:00AM - 4:30PM EST.
Back-Up Steering System Operation for the owner/user

The Drive-Master Back-Up Steering system is designed to provide emergency power steering in the event of engine stall or OEM power steering failure. You have a Back-Up Steering System because your OEM steering is modified to low or no effort. The Drive-Master back-up steering pump will automatically activate when the OEM power steering flow is disrupted. Audible and visual alarms alert the driver of the activation of the back-up steering system. (WARNING: THE ALARM BUZZER WILL STAY ACTIVE AS A REMINDER TO THE DRIVER TO GET OFF THE ROAD AS SOON AS POSSIBLE. STOP AND TURN OFF THE VEHICLE AND SUMMON HELP.)

The Drive-Master Back-Up system will become operational after the vehicle is running. This exclusive feature is accomplished by the Drive-Master back-up module (or relay in the toggle switch equipped model). Excessive current draw from the battery is eliminated until the engine is started. The back-up system’s operation can be tested two ways:

1. Start the engine. Turn the steering wheel left or right fully to end stops. The system will engage when the wheel hits the stop. The warning buzzer will sound (if equipped with buzzer), and the LED will light, alerting the driver of the back-up system’s operation.

2. The test/emergency switch can be manually operated from the Drive-Master back-up steering control module (or toggle switch) which overrides the system and activates the back-up steering immediately. Push the button or operate the toggle switch to the on position - the pump will run. Push the button again or toggle the switch to off & the pump will turn off.

The flow rate of the back-up steering pump is 3.5 gallons per minute. The system is V.A. tested and accepted. It will operate beyond the 180 second specification required for V.A. clients. The back-up system has its own one quart reservoir, and operates on the vehicle’s 12 volt battery.

**Maintenance:** Maintain normal fluid level in the OEM power steering reservoir. This should be checked when engine oil and filter are changed, every 3000 to 5000 miles.

**Leaks:** Any dripping or leak detection under vehicle – return to your mobility equipment dealer for repairs immediately.

**Steering:** If steering becomes hard to steer or noisy - return to your mobility equipment dealer for repairs immediately.

**Annually,** or every 30,000 miles - Return to your mobility equipment dealer for complete system check and replacement of the hydraulic low pour fluid in the system.

**Continuous Operation:** If the BUS motor runs continuously, turn vehicle off immediately and call your dealer for service.
DRIVE-MASTER  
BACK-UP STEERING SYSTEM  
LIMITED PARTS ONLY WARRANTY

DRIVE-MASTER warrants that the parts of your new Back-Up Steering System are free from defects in materials or workmanship for a period of 3 years or 36,000 miles from date of first retail purchase, whichever occurs first.

Return of Warranty Registration Card
Your return of the attached Warranty Registration Card within 10 days of your purchase is a condition of performance under this Limited Parts-Only Warranty.

What This Warranty Gives You:
If your Drive-Master Back-up Steering System is properly operated and maintained, any component covered by this limited warranty found to be defective in materials or workmanship, will be replaced without charge. Under this limited warranty, the sole and exclusive remedy is the replacement of defective parts with new or remanufactured parts, within Drive-Master’s sole discretion. 

NOTE – the cost of labor to install parts provided under this Limited Parts-Only Warranty is not covered by this Limited Parts-Only Warranty.

This Is Your Only Written Warranty
This Limited Parts-Only Warranty is the only express warranty applicable to your Back-up Steering System. Drive-Master does not authorize anyone to modify this Limited Parts-Only Warranty or to assume for Drive-Master any other obligation or liability in connection with this Limited Parts-Only Warranty.

Limitation on Implied Warranties and Consequential Damages
All Implied Warranties, including the implied warranties of merchantability and fitness for a particular use, are limited, to the extent allowed by law, to the time period covered by this Drive-Master New Back-up Steering System Limited Parts-Only Warranty, or to the applicable time period provided by state law, whichever period is shorter. Drive-Master is not responsible for any time that you lose, for any inconvenience you might be caused, for any commercial loss, for the cost of alternative transportation or hotels, or for any other incidental or consequential damages you may incur.

Some states do not permit a limitation on how long an Implied Warranty will last, or the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you.

This Warranty gives owners specific legal rights, and they may also have other rights that vary from state to state.

What Is Not Covered under this Limited Parts-Only Warranty

– Damage caused by accident or misuse or abuse
– Alteration, tampering or modification of the Back-up Steering System
– Claims involving disconnection or alteration of the vehicle odometer, or where the actual vehicle mileage cannot otherwise be determined
– Damage caused by failure to maintain or improper maintenance of the Back-up Steering System

See your Owner Maintenance section for proper maintenance of your Back-up Steering System.
We recommend servicing at qualified NMEDA dealers. Make sure your service location fills out the maintenance record in your owners manual so you will have a means to demonstrate that proper service has been performed.

– Other items and conditions not covered by this limited warranty
– Non - Drive-Master parts
– Normal wear and tear

How To Make A Claim
Contact Drive-Master at the following address and telephone:
37 Daniel Rd. West, Fairfield, NJ 07004 - 973-808-9709

Return of defective parts may be a condition of claim approval.
We suggest that you use mobility dealers who are members of the National Mobility Equipment Dealers Association (NMEDA). See www.nmeda.org or call us at 973-808-9709 and ask for the closest dealer.
IMPORTANT ADDENDUM
FOR CHEVY-FORD-TOYOTA
BACK-UP STEERING SYSTEMS

You must drain all fluid from the back-up steering system and refill with Lubriplate Special Low Pour hydraulic oil 5 gallon pail Part #LO767-060

If your local supplier does not have this product, call Lubriplate at 1-800-347-5343 for the nearest dealer who carries it.

If this fluid is not changed, there is the possibility the back-up pump reservoir will blow off the Back-up Steering Pump, and/or cause other serious damage. This will not be a warranty item.

021003
2000 Chevrolet Venture
Parts List

1 back-up pump and motor assembly with bracket and flow sensor attached.

1 solenoid.

1 back-up steering control module with wiring harness, OR:

   One toggle switch (on/off)
   One LED warning light
   One 8’ 14 gauge white wire (switch wiring)
   One 8’ 14 gauge orange wire (ignition wiring)
   One back-up steering relay
   Various electrical connectors

1 50” Blue tipped hose (compression fitting).
1 29” Red tipped hose (compression fitting).
2 46” yellow PUSH-LOK hoses with clamps.
1 10A circuit breaker.
1 24” 2 gauge battery cable with ends.
1 10” 4 gauge battery cable with ends.
1 1/4" Branch T assembly
1 3/8" Pipe Plug
1 Warning Label
1 Warranty Registration Mailing Card
1 Consumer User/Warranty Book
Jack up vehicle - support vehicle using 2 proper jack stands.
1. Disconnect OEM Battery.
2. Remove front right tire and both front plastic wheel well shrouds.
3. Remove both front corner lights and unclip front bumper cover.
4. a.) Mount Back-Up Steering pump/motor assembly under front bumper cover toward the right (passenger) side, with the bracket and hardware supplied. (See photos #1-2-3-4)
4. b.) Fill the bus canister with low pour fluid utilizing the 3/8” port. Plug after filling with the 3/8” pipe plug.
5. Remove the bolt holding the horn and relocate horn to sit on top of the frame.
6. Mount the Back-Up Steering solenoid on top of the cross bar running next to the battery. Make sure of proper grounding by cleaning paint from metal. See photo #5.
7. Connect the 24” length of four gauge red battery cable from the Back-Up Steering solenoid to the Back-Up Steering pump.
8. Cut the OEM rack return line that is attached to the right side of the engine cradle about 1-1/2” from the clamp. Flare the short end using double flaring tool. Holding the cut line, turn the rack return line 90° and secure with a 5/8” wire loop and 3/8” self-tapping sheet metal screw to the engine cradle. See photo #6.
9. Connect the 46” lengths of Back-Up Steering return lines (yellow PUSH-LOK hose). Route the lines along the top of the body frame using two 1-1/8” wire loops to secure them between the two holes for the plastic shroud. Connect them from two sides of T assembly located on the bus reservoir to each cut OEM return line from the rack. See photo #7 & #9
10. Cut the OEM Power Steering Pump pressure line approximately 3” from the pump.
11. Connect the 50” blue tipped pressure line from the Back-Up Steering Flow Sensor, to the OEM power steering pump pressure line. Route under the axle and rack. Secure with two metal wire loops and sheet metal screws. Screw into existing holes in the lower frame. See photo #7&8.
12. Connect the 10” length of two gauge red battery cable from the OEM battery to the Back-Up Steering solenoid.
13. Connect the 29” length red tipped pressure hose from the Back-Up Steering Pump to the pressure side of the rack.
14. Cut the lower plastic shroud if needed to fit properly.
15. Install wiring as per Wiring Procedure in installation manual.
WARNING: Do not let OEM pump run dry.
17. Test system operation prior to re-installing front bumper cover.
18. Check that all hoses and wires are away from any and all moving parts, and items that get hot: ie. any engine parts, mufflers and exhaust pipes.
19. Affix the warning label to the inside of the vehicle within view of the customer. Instruct customer of it’s placement.
20. Fill out warranty protection card. Have customer sign and return mail to Drive-Master to register the equipment.
21. Explain the system to your customer and give him the supplied Drive-Master Back-Up owner’s manual.
PREPARED FILLING INSTRUCTIONS

WARNING: The fluid level should be checked with engine off to prevent injury from moving components.

GENERAL PROCEDURE: Fill back up steering reservoir as stated in prior step. Fill OEM power steering reservoir. Attach hand vacuum pump to OEM power steering reservoir and carefully follow steps to completion. Fill OEM power steering reservoir & back up steering reservoir with Lubriplate Special Low Pour hydraulic fluid Part #LO767-060 or equal. Call 800-347-5343 for your nearest supplier.

CAUTION: If the air is not purged from the power steering system correctly, pump failure could result.

NOTE: Be sure the vacuum tool used in the following procedure is clean and free of any fluids.

1. Check the fluid level. As measured on the side of the reservoir, the level should indicate between MAX and MIN when the fluid is at normal ambient temperature. Adjust the fluid level as necessary. (Refer to 19 - Steering/Pump/FLUID - Standard (Procedure).

2. Tightly insert Power Steering Cap Adapter (4), Special Tool 9688, into the mouth of the reservoir (3).

CAUTION: Failure to use a vacuum pump reservoir (1) may allow power steering fluid to be sucked into the hand vacuum pump.

3. Attach Hand Vacuum Pump (2), Special Tool C-4207 or equivalent, with reservoir (1) attached, to the Power Steering Cap Adapter (4). Call 973-495-6182 Mactools. Ask for Kevin O’Malley. He has offered us special pricing for the tool and reservoir adapter M4000 Pump and MIL9688 Adapter.

CAUTION: Do not run the engine while vacuum is applied to the power steering system. Damage to the power steering pump can occur.

NOTE: When performing the following step make sure the vacuum level is maintained during the entire time period.

4. Using Hand Vacuum Pump (2), apply 68-85 kPa (20-25 in. Hg) of vacuum to the system for a minimum of three minutes.

5. Slowly release the vacuum and remove the special tools.

6. Adjust the fluid level as necessary. Refer to Step #1.

7. Repeat Step #1 through Step #6 until the fluid no longer drops when vacuum is applied.

8. Start the engine and cycle the steering wheel lock-to-lock three times.

NOTE: Do not hold the steering wheel at the stops.

POWER STEERING FLUID LEVEL CHECKING

WARNING: Fluid level should be checked with the engine OFF to prevent personal injury from moving parts and to assure an accurate fluid level reading.

NOTE: Although not required at specific intervals, the fluid level may be checked periodically. Check the fluid level anytime there is a system noise or fluid leak suspected.

The power steering fluid level can be viewed through the side of the power steering fluid reservoir. Compare the fluid level to the markings on the side of the reservoir. When the fluid is at normal ambient temperature, approximately 21°C (70°F to 80°F), the fluid level should read between the MAX. and MIN. markings. When the fluid is hot, fluid level is allowed to read up to the MAX. line.
Insert (2) supplied Blind Hole Clips in frame as shown.

Photo #1
Installation of pump mounting bracket.

Photo #2
Back-up pump mounted.

Photo #3

Attach ground strap
Installation Completed

Photo #4
Mount Solonoid to brace under hood in engine compartment as shown.

Photo #5
Cut and flare OEM metal power steering lines before installing yellow low pressure PUSH LOK. Secure to frame when done.

Photo #6
Hose Routing and mounting.

Photo #7
**WARNING:**

All hoses must be away from all moving parts of the engine vehicle suspension, and exhaust (if this is not done, failure will occur and warranty will be voided.)
T-Assembly with Fittings

Photo #9
Drivemaster Back-Up Steering System
Troubleshooting Guide

Do the diagnostics before you call 973-808-9709 and double check your wire connections. Mon.-Fri. 8:00AM - 4:30PM EST.

If back-up pump does not come on lock-to-lock:
Check green wire connected to the battery side of the solenoid (positive power) with key off.

Check orange wire positive power with ignition on.
With ignition off, cut ungrounded wire at the flow sensor. Check continuity through flow sensor. No continuity means a bad flow sensor.

If control module does not turn back-up system on:
With ignition on, ground out the red wire from the gray harness. The back-up pump should activate. If no activation, check pin connectors in the control module plug. If pin connectors are correct the control module is defective.

Check pin connectors in the plug.

After filling, bleeding, and running the system, BEFORE re-assembling the OEM vehicle body parts, run the vehicle to OEM operating temperature. Operate the Back-up steering system six to twelve times. Check the OEM reservoir for proper fluid level. Re-check all of your hydraulic connections for clean, dry, fittings with no leaks.

WIRING SYSTEM CHECK: Check wire connections from the control module

Green = Power + key off
Orange = Power + ignition on
Red = Flow Sensor
White = Solenoid trigger post
#2 Red = Positive battery terminal to solenoid (see diagram)
#2 Wire = Positive from solenoid to Drive-Master back-up steering pump

Verify system operation with engine failure:
a. Pull out fuel pump relay while engine is running
b. When engine stalls, Drive-Master back-up steering system will activate

Affix the warning label to the inside of the vehicle within view of the customer.
Instruct customer of it’s placement
**Legend**

OR: ORANGE = 12V IGNITION HOT  
GN: GREEN = 12V CONSTANT HOT (SOLENOID)  
BK: BLACK = GROUND  
PK1: RED = FLOW SENSOR TO RELAY/MODULE  
PK2: PINK = FLOW SENSOR TO PUMP GROUND OR CHASSIS GROUND  
WT: WHITE = SOLENOID TRIGGER POST (BOTH SYSTEMS)  
WT: WHITE = 12V HOT TO TRIGGER POST V1A ON/OFF TOGGLE SWITCH  
RD: RED = 12V HOT TO BATTERY (2 GA. WIRE)

**Warning:** Do not apply 12 volts directly to either pink wire on the flow sensor. The unit is ground operated and applying direct power will short out the device. The resulting damage is not under OEM warranty, and therefore not under warranty by Drive-Master.
WARNING: The ignition wire to the back-up steering system must be a true ignition wire. If you attach ignition wire to an accessory circuit the back-up steering will activate when you turn the vehicle off.

LEGEND
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Solenoid Wiring Diagrams

New type solenoids can be used on new or old back-up systems. Systems using a hot fired solenoid changed approximately Oct. 2003 to ground fired.

Ground Fired Solenoid

Hot Fired Solenoid
ALTERNATIVE FITTING & HOSE CONFIGURATION
ALL B.U.S. EXCEPT DODGE/CHRYSLER CARAVANS

Elbows can be configured as needed

3/8 Pipe Plug
Prefill Pump Here

PUSH-LOK Hose

Drive Master # 2007

Pressure Out

Other Configurations

Straight Thru

HOSE

HOSE