HAYES LEMMERZ®

INTERNATIONAL, INC.

# INSTALLATION AND OPERATING INSTRUCTIONS
# ENERGIZE III® #81741B

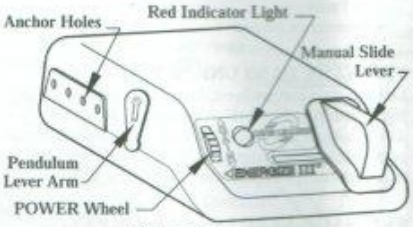

Figure 1

**FOR TRAILERS WITH 2 OR 4 ELECTRIC BRAKES AND VEHICLES WITH 12 VOLT NEGATIVE GROUND SYSTEMS ONLY.**

**INSTALLER AND OWNER**: Read and follow these installation and adjustment instructions carefully. Leave in tow vehicle for future reference. If there are questions on Installation, Adjustment, Trouble Shooting or Operation of Brake Controllers call **800-892-2676** Monday through Friday between 8:00 AM and 5:00 PM Eastern Time.

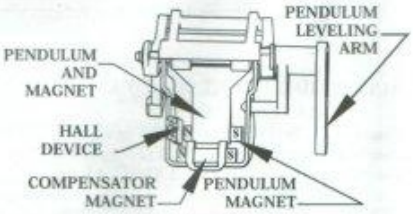

Figure 2

## AUTOMATIC OPERATION

During braking, when the tow vehicle stop lamps come on, the controller electric circuit is activated by power on the red stoplight wire connected to the tow vehicle stop lamp switch. As the tow vehicle decelerates, due to increased brake pedal effort, the pendulum magnet (Fig. 2) pulls away from the pendulum hall device and sends an electrical signal for the controller to increase amperage to the trailer brakes. The trailer brakes will apply in direct proportion to the tow vehicle braking effort. The controller red indicator light (Fig. 1) will illuminate from dim to bright during the stop and will return to dim when deceleration is no longer detected. When the tow vehicle brake pedal is released, the controller and red indicator light will be turned off.

**WARNING:** In the automatic mode, the trailer brakes are energized only when the pendulum sensor detects deceleration. With the vehicle at rest and the brake pedal depressed, there should be no or slight output to the trailer brakes.

## GAIN WHEEL ADJUSTMENT

The gain wheel (Fig. 1) is located on the front left side of the controller and is used to adjust the amount of current to the trailer brakes for obtaining smooth, proportional and optimum tow vehicle and trailer brake response. To increase the amount of current required, rotate the gain wheel upward toward the top of the case. To decrease the amount of current required, rotate the gain wheel downward toward the bottom of the case.

**WARNING:** Improper adjustment of the controller gain wheel and pendulum may result in loss of trailer brakes, steady or no red indicator light, aggressive, grabby, pulsating or delayed trailer brakes.

## MANUAL OPERATION

The manual slide lever (Fig. 1) located on the front right side of the controller is used to apply the trailer brakes independently of the tow vehicle brakes or to override the automatic trailer brakes. The further the manual slide lever is moved from the right to the left, the greater the amount of trailer braking effort applied. The manual lever operation is an independent circuit and overrides the gain wheel adjustment to allow full braking effort when required.

**WARNING:** The manual operation may not disengage the Cruise Control on some vehicles.

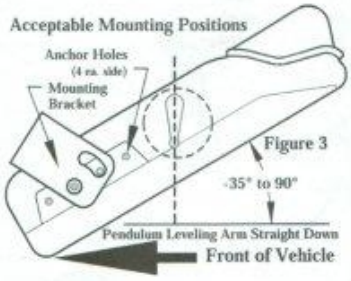

Figure 3

## CONTROLLER MOUNTING

The controller must be mounted with the back of the controller toward the front of the vehicle. Mounting angles must be within -35 to 90 degrees (Fig. 3). Use the reversible slotted mounting bracket. Do not mount upside down or sideways. If the controller is mounted incorrectly, the pendulum within the controller cannot operate correctly while braking and may cause loss of trailer braking.

1) Install the mounting bracket to a solid surface under the tow vehicle dash using the two sheet metal screws or the two machine screws and the Tinnerman fasteners provided and tighten until snug.

2) Insert four of the sheet metal screws provided through the mounting bracket holes and into the desired controller anchor holes and tighten until snug. Do not use longer screws than the sheet metal screws provided.

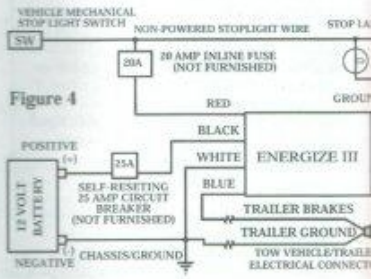

Figure 4

## CONTROLLER WIRING

Read the wiring instructions completely before you wiring the controller to the tow vehicle.

**WARNING:** All four controller wires must be connected properly for the controller to operate correctly (Fig. 4). Failure to do so can cause loss of trailer braking. The controller MUST be installed on 12 volt negative ground systems only. Reverse polarity, i.e. Reversing black battery (+) wire and white ground wire (-), breakaway kit activation without unplugging tow vehicle/trailer electrical connector or improper wiring will destroy the controller and void the manufacturer's warranty. Hayes Lemmerz recommends that all connections be made using insulated, solderless, crimp style connectors. Use 14 gauge or heavier wiring for all wiring connections.

**WHITE GROUND WIRE** must be connected grounded metal part of the firewall or directly to the negative (-) terminal of the battery. (Fig. 4)

**WARNING:** If not properly grounded, the controller and/or red indicator will not operate correctly, which may result in erratic or no trailer brakes and no red indicator. Improper or no connection may result in no trailer brakes or destroy the controller and void the manufacturer's warranty.

**BLUE BRAKE WIRE** must be connected direc the trailer brake wire or tow vehicle/ trailer connect (Fig. 4)

**RED STOPLIGHT WIRE** must be connected non-powered stop lamp wire of the stop lamp switc trailer tow wiring harness. It is recommended that a amp inline fuse be installed between the controller stoplight wire and the vehicle stop lamp switch connection. (Fig. 4)

**WARNING:** Refer to the vehicle manufacturer or Hayes Lemmerz for the latest controller red stoplight wire to stop lamp switch connections. Improper connections may result in no trailer brakes or destroy the controller and void the manufacturer's warranty.

**WARNING:** All 1999 and later Ford vehicles without the trailer tow wiring package: The controller red stoplight wire MUST be connected to the light green wire of the brake stop lamp switch through a 20-amp inline fuse. 1989-91 Ford Bronco, Econoline, F-Superduty and F 150-350 Series: The red stoplight wire MUST splice into the turn signal connector harness and not the stop lamp switch.

**BLACK POWER WIRE** must be connected through a 25 amp self resetting circuit breaker to the positive (+) terminal of the battery (Fig. 4). Route the black wire through a grommet hole in the fire wall to reduce wire grounding and away from the radio antenna to reduce any possible AM radio interference

**WARNING:** Do not connect the black wire to any vehicle power supply lines or fuse panels as such improper connections could cause circuit overload or damage to tow vehicle wiring and vehicle electronics.

## ADJUSTING THE PENDULUM

A. Connect the trailer to the tow vehicle for this adjustment. If a load leveling hitch system is used, it should be connected and operational. Locate the tow vehicle and trailer on a flat level surface. Make sure the tow vehicle stop lamps are operating correctly and disconnect the tow vehicle/trailer electrical connector between the tow vehicle and the trailer.
B. Adjust the gain wheel to its maximum setting.
C. Depress the brakes pedal far enough to turn on the vehicle stop-lamps. Hold this position.
D. Pull the pendulum leveling arm (Fig. 1) toward the red indicator light. The red indicator light should illuminate bright red.
E. Push the pendulum-leveling arm away from the indicator light until the light just reaches minimum brilliance. The leveling arm (Fig. 3) should be approximately straight down. Repeat steps D and E several times to make sure the indicator light has just reached minimum brilliance.
F. Release the brake pedal. The pendulum is now initially adjusted. A readjustment may be necessary if the loading of either the tow vehicle or trailer causes a considerable change in the tow vehicle front to rear position. Also a further readjustment may be desired during road test and performance adjustments.
G. Move the controller manual slide lever (Fig. 1) to the left, the controller red indicator light must become increasingly brighter and the tow vehicle stop lamps must illuminate.
H. If the red indicator light does not illuminate or glows dimly, the tow vehicle has a short to ground in the trailer brake circuit or the controller white ground wire is not connected to ground, check and repair wiring and tow vehicle/trailer connector.
I. If the stop lamps do not illuminate, check the red stoplight wire connection of the brake controller for connections to the non-powered stop lamp wire of the vehicle stop lamp switch.
J. Connect the tow vehicle/trailer electrical connector. Move the controller manual lever to the left. The controller red indicator light must illuminate from dim to bright and the trailer stop lamps must illuminate.
K. If the red indicator light does not illuminate or glows dimly, check and repair the trailer brake magnets and trailer brake circuit (including the tow vehicle/trailer connector) for a short to ground.
L. If the trailer stop lamps do not illuminate, check and repair trailer wires, bulbs, bulb ground connections and the tow vehicle/trailer connector.
Also check the red stop light wire connection of the brake controller for connections to the non-powered stop lamp wire of the vehicle stop lamp switch.

**NOTE:** It is normal to hear the trailer brake magnets "hum" when operating the trailer brakes.

## ROAD TEST AND PERFORMANCE ADJUSTMENTS

To adjust the gain wheel (Fig. 1) setting with the trailer connected.
A. Find a flat, hard, dry surface.
B. Adjust the gain wheel to the midrange setting.
C. At a moderate speed (25mph or less) push on the tow vehicle brake pedal in a normal manner. A firm braking action should occur.
D. The red indicator light should illuminate from dim to bright during the stop and back to dim after the stop is completed.
E. If more trailer braking is required, increase the gain wheel. If less trailer braking is required, decrease the gain wheel.

**WARNING:** Gain wheel adjustments may be required based upon speed, trailer load and road conditions. Optimum trailer braking occurs just before the trailer wheels lockup. Trailer brake lockup could cause loss of control of the trailer and/or tow vehicle.

F. At a moderate speed (25mph or less) energize the manual lever slowly to the left. A much harder stop can always be obtained, as the gain wheel setting does not affect the manual lever. The red indicator light should illuminate from dim to bright during the stop.
G. Readjustment of the pendulum-leveling arm: If the conditions described occur, refer to Figures 3, 5 and 6 for the affects of pendulum leveling arm adjustment.

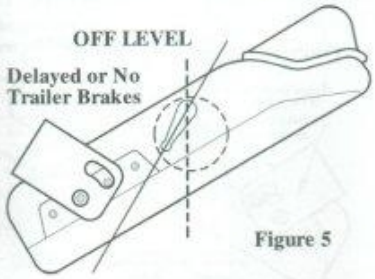

Figure 5

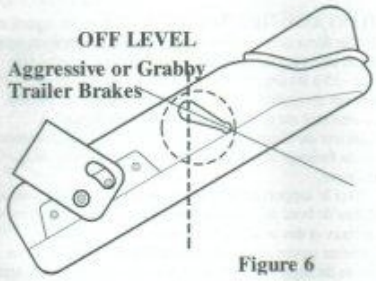

Figure 6

1. Pendulum leveling arm adjusted too far to the rear the controller (Fig. 5):
   - No indicator light
   - Delayed braking
   - No braking
2. Pendulum leveling arm adjusted too far toward the front of the controller (Fig. 6):
   - Steady illuminated indicator light
   - Grabbing trailer brakes
   - Trailer brakes will pulse with 4-way flasher lig
3. Pendulum leveling arm adjusted correctly (Fig. 3):
   - Dim indicator light when vehicle is stopped on level
   - Increasing indicator light as pedal effort is increased while stopping
   - Smooth braking

## BRAKING ON HILLS

When properly adjusted, the controller will allow a slightly greater amount of trailer braking going dowr and slightly less trailer braking going uphill. Normal no controller readjusting is needed for towing in the

## TRAILER BRAKING WITH 4-WAY FLASHERS OPERATING

A. With the controller properly adjusted, the red indicator light may flash with the 4-way flasher light but will not operate the trailer brakes. (Fig. 3)
B. If the controller is not adjusted correctly; the trail brakes can possibly pulse with 4-way flasher lights. (Fig. 6)

## HAYES LEMMERZ TRAILER ACCESSORIES

Syncronizer (2 - 4 Brakes) Controller #81725
ENERGIZE III (2 - 4 Brakes) Controller #81741B
ENERGIZE XPC (2 - 4 - 6 Brakes) Controller #817
ENERGIZE XPC Manual Remote #81746
ENERGIZE XPC with Manual Remote #81747
Micro Control HD Plus (2 - 4 - 6 - 8 Brakes) Controller #81750
Micro Control HD Plus Manual Remote #81751
Air Brake Controller #100400B
Ammeter #810
Trailer Wheels