

ACA Performance Inc.

Instructions and Information Package

Metal-Halide Arc Discharge headlamp package

Part Numbers HID 7-0013 and HID 7-0011

1-General Information:

HID Package HID 7-0013 and HID 7-0011 are complete headlamp systems. Unlike 'retrofit' or 'adapter' packages that replace some elements of an existing headlamp system, the HID 7-0013 and HID 7-0011 include ALL components except for headlamp mounting brackets. The HID 7-0013 headlamp system requires bracketry of the same type used with a quad-round sealed beam, type C headlamp system consisting of two 5.75" round sealed-beam high/low-beam headlamps marked "2" or "2C1" and two 5.75" round sealed-beam high-beam headlamps marked "1" or "1C1". The HID 7-0011 headlamp system requires bracketry of the same type used with a quad-rectangular sealed beam, type A headlamp system consisting of two 165mm x 100mm rectangular sealed-beam high/low-beam headlamps marked "2A1" and two 165mm x 100mm rectangular sealed-beam high-beam headlamps marked "1A1".

2- DOT compliance information

HID 7-0013 and HID 7-0011 are certified as complying with all applicable performance, construction and durability requirements under US Federal Motor Vehicle Safety Standard 108 and under Canadian Motor Vehicle Safety Standard 108 for a headlamp system for use in on-road vehicles in the US and Canada. Examine the lenses of the headlamps contained in your HID 7-0013 or HID 7-0011 headlamp package. Note the "DOT" lens marking. This is your assurance that these headlamps, when properly installed and correctly aimed, are legal for on-road use in cars and trucks in all states, provinces and territories in America and Canada. **IMPORTANT: In order for your vehicle to remain compliant with state, provincial and/or federal lighting laws, you must install ALL components of the HID 7-0013 or HID 7-0011 package. Do not attempt to mix components of the HID 7-0013 or HID 7-0011 with parts from any other headlamp system.** Doing so may create a noncompliance with applicable regulations and requirements, and will reduce your roadway safety after dark. If replacement parts are required, use only genuine **ACA** components.

3- Headlamp function information

Conventional headlamps operate by passing electric current through a tungsten filament wire. The electric current causes the filament to get white-hot, which produces light. This light is bounced off the reflector and passed forward through the lens to produce a headlamp beam.

Arc Discharge headlamps, including the low beam headlamps in ACA HID 7-0013 and HID 7-0011 headlamp packages, operate by using an electronic controller (ballast) to produce a high-voltage current which creates and maintains an electrical arc between two electrodes inside a capsule containing Xenon gas and metal salts. The heat from the arc vaporizes the metal salts, and the metallic vapor makes the arc extremely bright. Arc Discharge headlamp capsules are much more efficient. They produce about 3 times the light produced by a Tungsten filament, while using less than 2/3 the electricity. Arc Discharge headlamp capsules are also many times more durable and much more resistant to vibration than tungsten filaments. **Arc Discharge headlamp capsules cannot safely be retrofitted to headlamps meant to use tungsten filament bulbs**, which is why the ACA HID 7-0013 and HID 7-0011 packages are engineered and constructed as complete Arc Discharge headlamp systems, right from the start.

4-Beam pattern information

A headlamp beam is not simple. It is not a floodlight that sprays light in all directions, nor is it merely a spot beam that concentrates light in one direction only. Headlamp beams are specifically designed to place light where it needs to go so that you can safely see at night in good and bad weather, while at the same time not blinding other road users. Proper beam pattern design is very important not only to maintain and improve your roadway safety and to protect others' roadway safety, but also to comply with state, provincial and federal headlighting regulations. The ACA HID 7-0013 and HID 7-0011 packages produce a good, safe, high-performance and legally compliant beam pattern.

5- Unpacking and assembly information

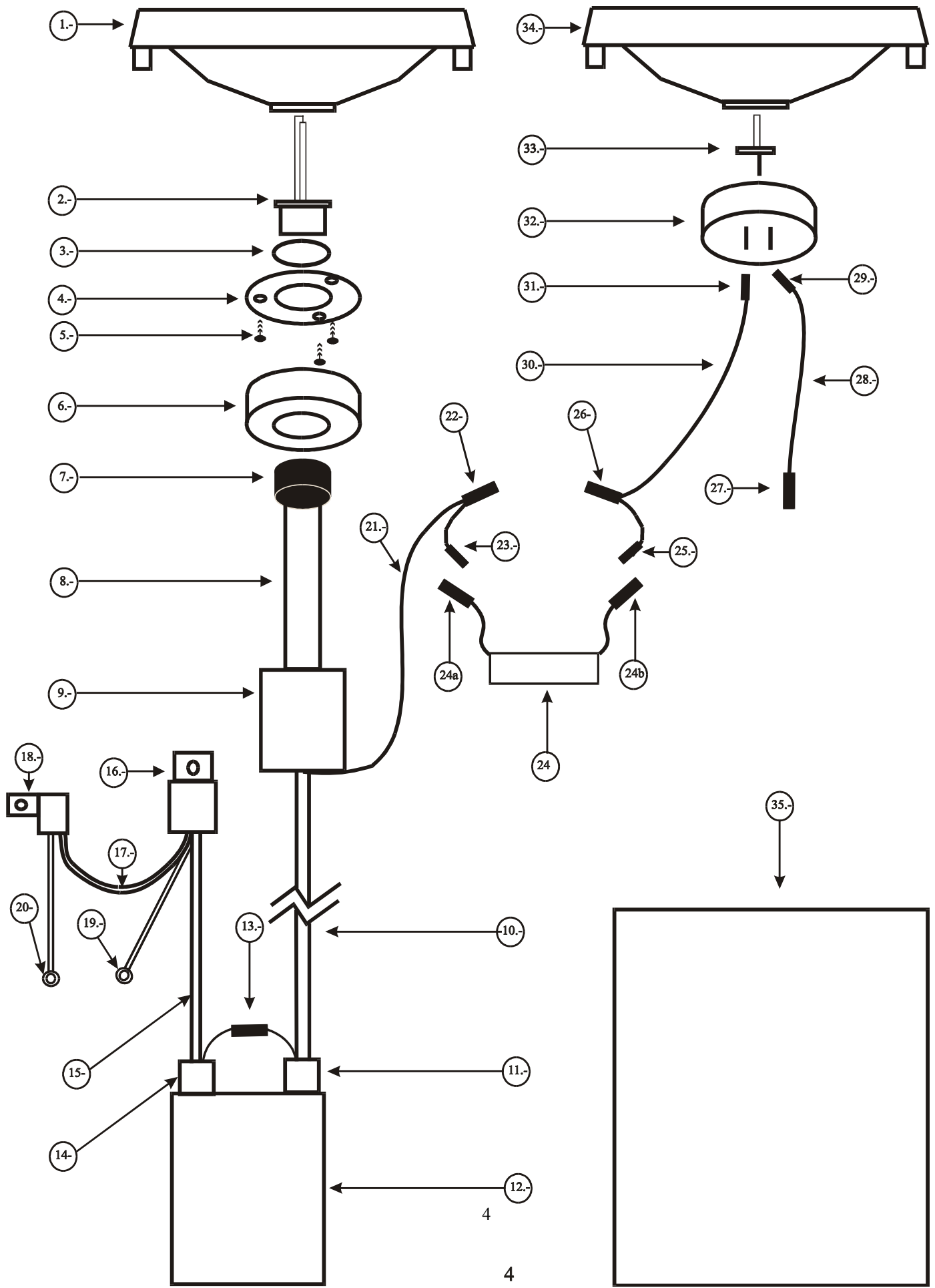
Unpack your HID 7-0013 or 7-0011 headlamp package. You will find:

Fig	Description	Qty.
1.-	HID Low Beam Headlamp	2
2.-	D2R HID Bulb	2
3.-	Rubber O-Ring	2
4.-	Retainer Plate	2
5.-	Screws	6
6.-	Dust Boot	2
7.-	D2R Socket	2
8.-	High Voltage Harness	2
9.-	Igniter	2
10.-	Short / Long Wire Harness	1/1
11.-	Black Connector to Ballast	2
12.-	HID Ballast	2
13.-	Trigger Wire Split	2
14.-	Grey connector to Ballast	2
15.-	Wire harness to Relay	2
16.-	30A Relay with Tab	2
17.-	Wire Harness to Fuse	2
18.-	Fuse Holder with Tab	2
19.-	Relay Eyelet Connector	2
20.-	Fuse Eyelet Connector	2
21.-	Trigger Wire	2
22.-	Trigger Connector	2
23.-	Trigger Pig-tail Connector	2
24a-	Bridge Low Beam Connector	1
24.-	High/Low Beam Bridge	1
24b-	Bridge High Beam Connector	1

Fig	Description	Qty.
25.-	High Beam Pig-tail Connector	2
26.-	High Beam Feed Connector	2
27.-	High Beam Ground Connector	2
28.-	High Beam Ground Wire	2
29.-	High Beam Spade Connector	2
30.-	High Beam Feed Wire	2
31.-	High Beam Bulb Connector	2
32.-	Dust Boot	2
33.-	H1 Bulb	2
34.-	High Beam Headlamp	2
35.-	Hardware Bag	2

Hardware Bag Contents	
Qty.	Description:
3	Bolts
3	Nuts
3	Washers
8	Plastic Wraps
1	20 Amp Fuse
1	Velcro
3	Male Connectors
4	Self tapping screws

Layout all of the parts so that you can have ready access to them as you assemble your headlamp package and install it in the vehicle.



6-Installation

NOTE: It is recommended that a qualified service technician do the installation.

Installation of the HID 7-0013 or HID 7-0011 headlamp system will require both mechanical placement of components, and electrical wiring of components. All components must be secured to the vehicle as directed and all wiring and splicing must be done in a good and durable manner. Use quality terminals and supplies, work carefully and ensure that none of the wiring work done in the process of installing the headlamp system will:

- Interfere with other vehicle systems
- Deteriorate due to vibration, corrosion, heat, or exposure to moisture or dirt
- Present a hazard to service personnel

To install the HID 7-0013 or HID 7-0011 headlamp system on a vehicle:

You will need to get access to the REAR of the headlamps once they are installed in the vehicle's headlamp brackets. If your vehicle does not have provisions for access to the rear of the headlamps with the lamps in the brackets, it may be necessary to gain access by cutting or drilling a hole in the rear of the headlamp compartment. In some cases, it may be sufficient to remove the headlamp holder brackets, install the lamps in the brackets, connect the headlamp wiring to the rear of the lamps, then reinstall the holders with the connected lamps already installed. Each specific vehicle type will vary somewhat. Take time to examine the headlamp holders and headlamp compartment on your specific vehicle to determine the best way to gain or create access and room for the wiring. It will be necessary to find or create a hole, which the Arc Discharge headlamp socket and wiring will pass through to the rear exterior of the headlamp compartment. It is usually best to use the hole through which the old headlamp wiring passes, though you may need to enlarge it. In some cases, you can remove the headlamp housing and bracket from the vehicle, place the ballast behind the rear of the housing, place the arc capsule socket in front of the front of the housing, create a notch in the edge of the housing for the cable, then reinstall the ballast and notched

housing at the same time. In all cases, make sure sharp metal edges will not rub or chafe the arc capsule cable.

Attach each pre-assembled wiring harness to the Arc Discharge ballast. The wiring harness uses colour-coded, keyed plugs and sockets for easy assembly and to ensure it can only be assembled correctly. Take a moment to examine the wiring harness. You will see a gray plastic plug and a black plastic plug. There is a matching gray plastic socket and a matching black plastic socket on the Arc Discharge ballast. Gently but firmly insert the black plug into the black socket, and the gray plug into the gray socket.

To connect the Arc Discharge socket to the low beam headlamp, line-up the slots in the socket rim with the pins on the capsule base. Push the socket evenly and firmly onto the capsule and twist it slightly clockwise until it stops.

The arc starter module is a small metal box between the ballast (large metal box) and the headlamp arc capsule. Secure it to a convenient location using supplied adhesive Velcro.

Install the low beam and high beam lens-reflector units in the headlamp brackets. Make sure all brackets and retainer rings are in good condition. On each side of the vehicle, the low beam must be installed in the **outer** or **upper** headlamp holder, and the high beam must be installed in the **inner** or **lower** headlamp holder. Install and secure the retaining rings so that the headlamp lens-reflector units are held securely and evenly in the headlamp holders. Do not install the headlamp bezels at this time.

To mount the Arc Discharge headlamp ballast:

Select a location that will be protected from road splash, excessive heat or excessive vibration, and is within reach of the headlamps, determined by the length of the cable connected to the grey plug on the ballast. You will notice that there is one long harness and one short harness – this is to facilitate mounting in a common location. The inner fenderwell or the radiator support is often a suitable location. **DO NOT** attempt to increase the length of any portion of the cable connected to the grey plug on the ballast! Secure the ballast using the three mounting tabs cast into the ballast housing.

If you are installing the HID 7-0013 or HID 7-0011 system on an application that will involve severe vibration, utilize appropriate anti-shock mounting hardware to reduce vibrations reaching the ballast.

Examine the portion of the wiring harness that is connected to the black plug on the ballast. You will find a four-pin receptacle socket, which is attached to a relay. Utilizing the tab on the relay, mount this relay and plug to a location convenient to a constant (non-ignition-controlled, non-switched) 12V source, such as the battery terminals or the charging terminals and a suitable ground.

The red wire with the ring terminal must get connected to an unswitched, non-ignition-controlled +12V feed, such as the +Positive battery terminal or the +Positive charging terminal. The black wire with the ring terminal must be connected to an unswitched, non-ignition-controlled ground, such as the negative battery terminal, the negative charging terminal, or the alternator housing.

You will find an oblong black plastic housing in the red wire between the ring terminal and the relay/plug assembly. This oblong black plastic housing is a splashproof fuseholder. Using the tab on the fuseholder, mount this fuseholder to a location that will not stretch the red wire and will not be subjected to excessive heat. Lift the locking tab away from the fuseholder body and pull the fuseholder plug (with two red wires) out of the fuseholder. Install a 20A miniature blade type (ATC20) fuse in the fuseholder plug, then replace the fuseholder plug in the fuseholder housing.

GREEN TRIGGER WIRE:

The single green wire switches the HID 7-0013/HID 7-0011 system on or off. It must be wired in one of several ways to operate correctly.

1.- VEHICLES WITHOUT DAYLIGHT RUNNING LIGHTS and VEHICLES WITH DAYLIGHT RUNNING LIGHTS THAT OPERATE THE TURN SIGNAL BULBS FULL-TIME:

Connect the green wire to the low-beam feed wire on each side of the vehicle. This is the wire that receives 12V power when the low beam headlamps are switched on. Connectors are supplied.

2.-VEHICLES WITH DAYLIGHT RUNNING LIGHTS THAT OPERATE THE HEADLAMPS FULL-TIME:

Vehicles on which the headlamps also serve as Daylight Running Lights (DRLs) require special wiring to permit proper operation of the HID 7-0013 or HID 7-0011 headlamp system while maintaining a safe and legally-compliant DRL function. First, determine what type of DRL operation is used on your vehicle. With no headlamps installed on your vehicle, perform the following sequence of tests to determine what kind of DRL system your vehicle uses, and how to wire the HID headlamp system appropriately.

- 1) Find the vehicle low-beam feed wire on one side of the vehicle. This is the wire that receives 12V power when the low beam headlamps are switched on.

- 2) Place a voltmeter between the low-beam headlamp feed and ground. Switch-on the low beam headlamps. Measure and record the voltage. Switch off the low beam headlamps.

- 3) With the voltmeter still between the low-beam headlamp feed and ground, and the low beam headlamps switched off, activate the DRLs. Depending upon the type of DRL system, this may involve starting the vehicle, releasing the parking brake, and/or placing the vehicle in a forward gear

range. **USE CAUTION when performing a voltage check on a running vehicle!** Measure and record the voltage. Switch off the low beam headlamps.

4) Compare the voltage reading obtained in step 2 with the voltage reading obtained in step 3.

If the voltage obtained in step 2 matches the voltage obtained in step 3: Your vehicle is equipped with full-voltage low-beam DRLs. Connect the green wire to the low-beam feed wire on each side of the vehicle.

If the voltage obtained in step 2 is higher than the voltage obtained in step 3: Your vehicle is equipped with reduced-voltage low-beam DRLs. Connect the green wire to an ignition-switched source of +12V.

HOW TO SELECT an ignition-switched source of +12V

The ignition switch in your vehicle controls many circuits. An ignition-switched source is a circuit that receives +12V when the ignition is in the "RUN" position, but not in the "ACCESSORY" or "OFF" position of the ignition switch. It may be helpful to consult the vehicle wiring diagram to locate and select such a circuit.

If the voltage obtained in step 3 is zero volts: Your DRL system does not use low beam headlamps. Proceed to the next test:

1) Locate the vehicle's high-beam feed wire (the wire that receives 12V power when the high beam headlamps are switched on).

2) Place a voltmeter between the high-beam headlamp feed and ground. Switch-on the high beam headlamps. Measure and record the voltage. Switch off the high beam headlamps.

3) With the voltmeter still between the high-beam headlamp feed and ground, and the high beam headlamps switched off, activate the DRLs. Depending upon the type of DRL system, this may involve starting the vehicle, releasing the parking brake, and/or placing the vehicle in a forward gear range. **USE CAUTION when performing a voltage check on a running vehicle!** Measure and record the voltage. Switch off the high beam headlamps.

4) Compare the voltage reading obtained in step 2 with the voltage reading obtained in step 3.

If the voltage obtained in step 2 matches the voltage obtained in step 3: You performed the test improperly, or there is a vehicle wiring fault. High beam headlamps are never run at full voltage as DRLs.

If the voltage obtained in step 2 is higher than the voltage obtained in step 3: Your vehicle is equipped with reduced-voltage high-beam DRLs. This DRL type is not compatible with the HID headlamp system, so DRL operation must be moved to the low beam headlamps. Connect the green wire to an ignition-switched source of +12V. **You will need to disable the high-beam DRL circuitry of the vehicle by disconnecting, removing or deactivating the vehicle's DRL module. Consult the vehicle service manual and wiring diagrams.**

HOW TO SELECT an ignition-switched source of +12V

The ignition switch in your vehicle controls many circuits. An ignition-switched source is a circuit that receives +12V when the ignition is in the "RUN" position, but not in the "ACCESSORY" or "OFF" position of the ignition switch. It may be helpful to consult the vehicle wiring diagram to locate and select such a circuit.

If the voltage obtained in step 3 is zero volts: Your DRL system does not use high beam headlamps, or your vehicle does not have DRLs.. Refer to vehicle service manual for a description of the DRL system on your vehicle, if applicable.

UNDER NO CIRCUMSTANCE should you hook the HID headlamp system to anything but a full-voltage source. Connecting to a reduced-voltage source will not reduce the intensity of the headlamps and will damage system components.

7- Installing high-beam headlamps

- 1) Without high beam headlamps installed on the vehicle, turn on the headlamp switch and make sure the beam selector is set to the "high beam" position.
- 2) Place a voltmeter or test light between a good ground and first one, then the other vehicle high-beam headlamp wire. The wire that produces a reading of approximately 12 Volts on the voltmeter is the feed wire; the remaining wire is the ground wire.
- 3) The H1 high beam should already have the bulb, boot and short wiring harness installed. Using supplied connectors, connect the feed wire to the red wire on the harness. Next, connect the ground wire to the black wire on the harness.
- 4) The white wire is discussed in the next step.

8- High-beam bridge

The HID 7-0013 and 7-0011 systems are designed for the low beam headlamps to remain on when the high beams are selected. The high-beam lamps provide long-distance, down-the-road throw needed for driving on dark, empty roads at night, while the low beam lamps provide the near and midrange illumination. The high-beam bridge, a black plastic box with one green and one white wire, permits the lamps to function in this manner.

- 1) Connect the green "LOW BEAM" bridge wire to either the right or left vehicle low-beam feed wire by using the preinstalled green pigtail.
- 2) Connect the white "HIGH BEAM" bridge wire to the high-beam feed wire using the preinstalled white pigtail wire from the high beam lamp on the same side of the vehicle used in the previous step.
- 3) There will now be 2 pigtail connectors on the other side of the vehicle that will not be used. **These must be sealed off and insulated as they are live.**

9- Aim information

ATTENTION: ALL HEADLAMPS, including those in your HID 7-0013 or HID 7-0011 headlamp system, are **DANGEROUS** and **INEFFECTIVE** if they are not aimed properly. Improper aim robs your headlamps of their ability to shine light where you need it in order to see your way through the night, and, especially with high-performance headlamps such as these, also creates blinding glare for other road users. Improper aim can also be cause for a police officer to issue you a citation. It is **very important** and **very worthwhile** for you to have your headlamps aimed properly.

Your HID 7-0013 or HID 7-0011 headlamps, like most headlamps in the US and Canada, **CANNOT** be correctly aimed using visual (by eye) methods. Various visual methods have been printed in service manuals over the years. These usually involve measuring the height of the headlamps, placing the vehicle on level ground a certain distance from a wall, marking the headlamp height on the wall, and adjusting the headlamps to shine a certain way relative to the markings on the wall. **THESE METHODS ARE UNSUITABLE**, because they result in incorrect aim.

In order to aim your HID 7-0013 or HID 7-0011 headlamps correctly, a headlamp aimer set must be used which interfaces with the prongs on the lens faces of the lamps. Equipment meant for use with sealed-beam headlamps is acceptable for use with HID 7-0013 or 7-0011, because the lens prongs on these headlamps are in the same locations and orientation as those on a sealed-beam headlamp. Follow the instructions supplied by the headlamp aimer manufacturer regarding vehicle condition (fuel load, tire inflation, vehicle load, etc.) and correct operation of the aimer.

Headlamp aim should be checked and, if necessary, corrected on a regular schedule, especially in high-vibration or high-mileage applications. Remember, headlamp aim is normally checked upon replacing a burnt-out headlamp. However, your HID 7-0013 or HID 7-0011 headlamps will last many times longer than conventional headlamps, so it is important to remember to check the aim frequently.

10-Maintenance

No routine maintenance is required. Headlamp aim should be checked and, if necessary, corrected on a regularly scheduled basis. Headlamp lenses should be cleaned with plenty of clean water and soap. The polycarbonate lenses on your ACA headlamps are designed to withstand most standard cleaning chemicals. However, as with all polycarbonate lenses, they can be scratched if insufficient water or a dirty wash cloth is used.

It is strongly recommended that copies of these instructions be kept with the vehicle service manual, should the headlamp system require service at a future date. It is also recommended that copies of these instructions be kept in the vehicle at all times, should the headlamp system require service in a location other than that where it was originally installed. Questions or comments concerning the installation or performance of your ACA HID headlamp system should be referred to:

ACA Performance – 1-800-816-3665

NOTES: