Installation MANUAL

PACBRAKE®

DirectMount

EXHAUST BRAKES

COMPRESSOR INSTALLATION

APPLICATIONS:

Vehicles With **NO** Air System Requiring An Exhaust Brake

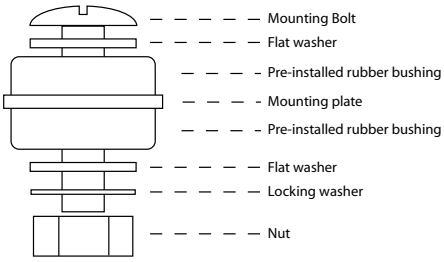
Getting Started

Before starting, be sure your kit contains all parts necessary.

1 This manual covers the installation and basic wiring of a Pacbrake compressor for use on vehicles without an onboard air system which require an engine retarder. Installation instructions for mounting the exhaust brake unit into the exhaust system are covered in the standard installation manual #L2009.

2 Select a location to mount the 12V air compressor. Locate a flat and secure metal surface away from heat sources that could damage the compressor. The compressor is moisture and splash resistant, but is not water proof. Do not mount the compressor in a location where it will be in contact with water. To maximize the compressor's performance, locate it close to the battery. Do not mount the compressor near areas where flammable liquids are stored. The compressor makes an audible pumping sound when activated. Consider this when choosing a mounting location.

3 Using the compressor mounting hardware supplied, and the template on the back page, drill 3 mounting holes and install compressor assembly.

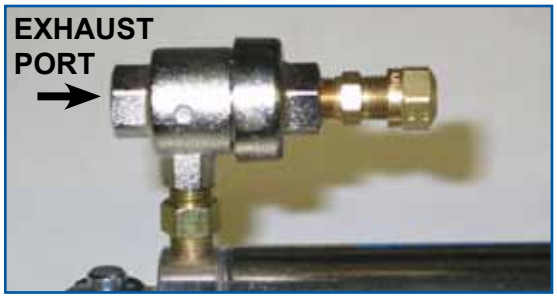


4 **Remote inlet air filter installation:**

Install the ¼" NPT(F) x ¼" tube fitting onto inlet air filter and hand tighten (Teflon tape is not recommended). Locate an appropriate area where remote inlet filter is to be installed. Keep in mind the location should be dry and away from any heat source, and that the air inlet slots on the inlet air filter are free from blockage, and are facing downward. The air inlet filter should be located lower than the compressor. Drill a 3/8" mounting hole. Push remote filter bracket pin into hole. Insert the ¼" nylon airline to the fitting of air inlet port of compressor. Route the nylon airline to remote inlet air filter. Measure and cut to the appropriate length then attach to remote inlet air filter. When routing airline tubing, always remember to avoid sharp edges, heat sources, and tight bends that could restrict the air intake (Airline must be routed at least 12" away from exhaust system and components).

Some installations require a quick release valve be installed in the air cylinder. If one is included in your kit follow STEPS 5 & 6. If one is NOT provided proceed to STEP 7.

5 Using thread sealant, install the quick release valve into the air cylinder on the brake unit as shown. Aim the exhaust port away from areas where contamination, such as road spray may exist. Attach the hose fitting to the quick release valve, again using thread sealant.

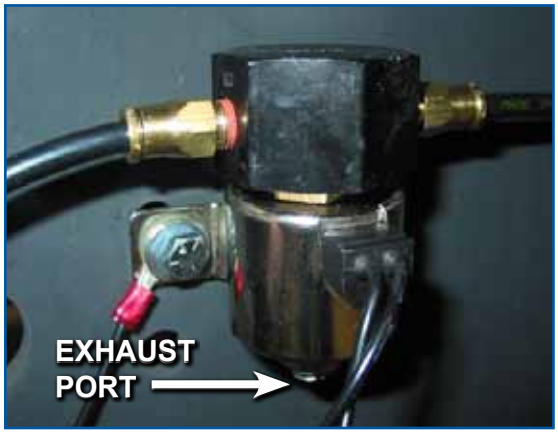


For all other installations install the 90° fitting provided into the air cylinder using thread sealant.

Note: Exhaust port remains open

6 Connect and route the Teflon air hose from the compressor assembly to the quick release valve/fitting on the exhaust brake.
Cut the hose and make the connection, being careful that the hose is secured away from any heat source that could damage it.

7 Choose a location close to the exhaust brake to mount the air solenoid. The solenoid must be mounted with the exhaust port pointing down as shown in the photo. Using the eye terminal provided, connect one of the two black wires to one of the solenoid mounting fasteners. Ensure a good ground is achieved. Using the fittings and airline provided, connect the solenoid port marked “IN” to the fitting at the air compressor. Using the remaining length of airline and fittings, connect the solenoid port marked “CYL” to the air cylinder of the exhaust brake.



Electrical Installation

Every vehicle has different exhaust brake interface requirements depending on the optional equipment, type of engine, transmission and antilock brake systems. It is impossible to provide a wiring schematic for every combination of engine, transmission and antilock braking systems available on trucks today. It is also impossible to keep up with the rapid changes to vehicle electrical systems. Some vehicle OEM’s require the electronic control module to be turned on, some also require the dash switch be enabled, they do charge to perform the turn on at no preset cost. If you decide to interface with the VOEM wiring, it would be expedient to contact the vehicle manufacturer with the VIN# for their version of the exhaust brake wiring.
Upon request Pacbrake can provide a wiring schematic for most engine and transmission combinations but cannot held responsible for it’s compatibility with the VOEM.

The schematics provided in this manual are generic samples to meet the minimum requirements for exhaust brake operation.

Please consider the following requirements for exhaust brake actuation, choose which systems meet the customers needs.

1) The exhaust brake should have a throttle switch or throttle switch relay, in order to prevent the exhaust brake from being applied when the engine is under power.
2) The exhaust brake should have a cruise control relay installed, or means to prevent the exhaust brake from being applied when the engine is under power. ***Not required with Allison Transmissions**
3) The exhaust brake must have an ABS (antilock brake) disable relay installed if equipped with ABS, or means to turn the exhaust brake off if wheel skid occurs.
4) If the exhaust brake is installed on a vehicle with an Allison electronic transmission it must be interfaced, in order to provide the torque converter unlock feature and automatic downshifting.
5) The exhaust brake to be used as a warm-up feature requires a special dash switch and an additional relay in some cases.

The choice of the electrical actuation system should be discussed with the vehicle owner prior to starting the installation. The VOEM integrated system provides the most seamless interface with the other vehicle features, but is by far the most difficult and costly to install. The basic schematics provided in this manual are simple to install and are the most cost effective to the customer. Pacbrake technical service will assist you in choosing the correct control group for your choice of actuating system should you have difficulty.

Electrical Installation Instructions

8A OPTIONAL FOOT SWITCH GROUP INSTALLATION:

Mount the electrical foot switch in a convenient location on the floor for actuation by the driver's right or left foot. The foot switch is the only switch in the exhaust brake system required to achieve retarding mode.

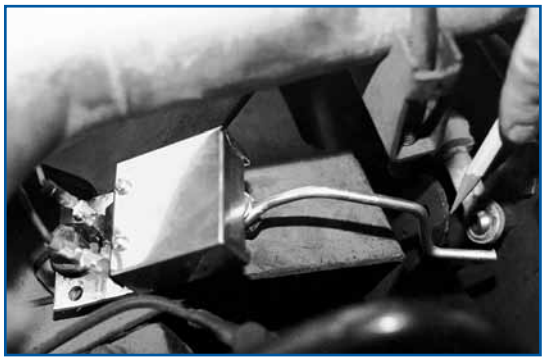
See Schematic "A".

Note: This system should have a switch or relay installed to prevent the exhaust brake from being applied when the throttle is depressed.

8B THROTTLE SWITCH INSTALLATION (mechanical engines):

This system requires installing a dash switch in a convenient location for the operator. Mount the throttle switch so the switch actuating arm is contacted by the throttle linkage. Adjust the throttle switch so that the arm is contacted and the switch "clicks" (closes) when the throttle is within 1/4" of its totally closed position.

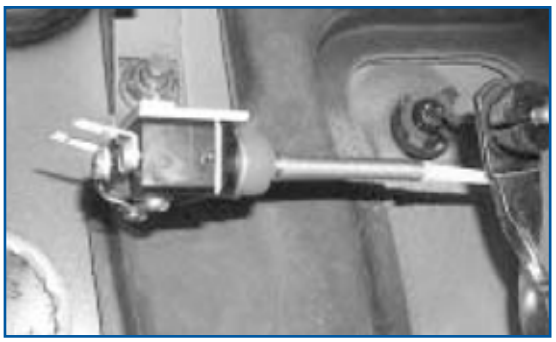
NOTE: This group contains a dash and throttle switch. See schematic B.
The mounting of this switch varies between engine types. It is permissible to bend the switch arm to achieve proper adjustment.



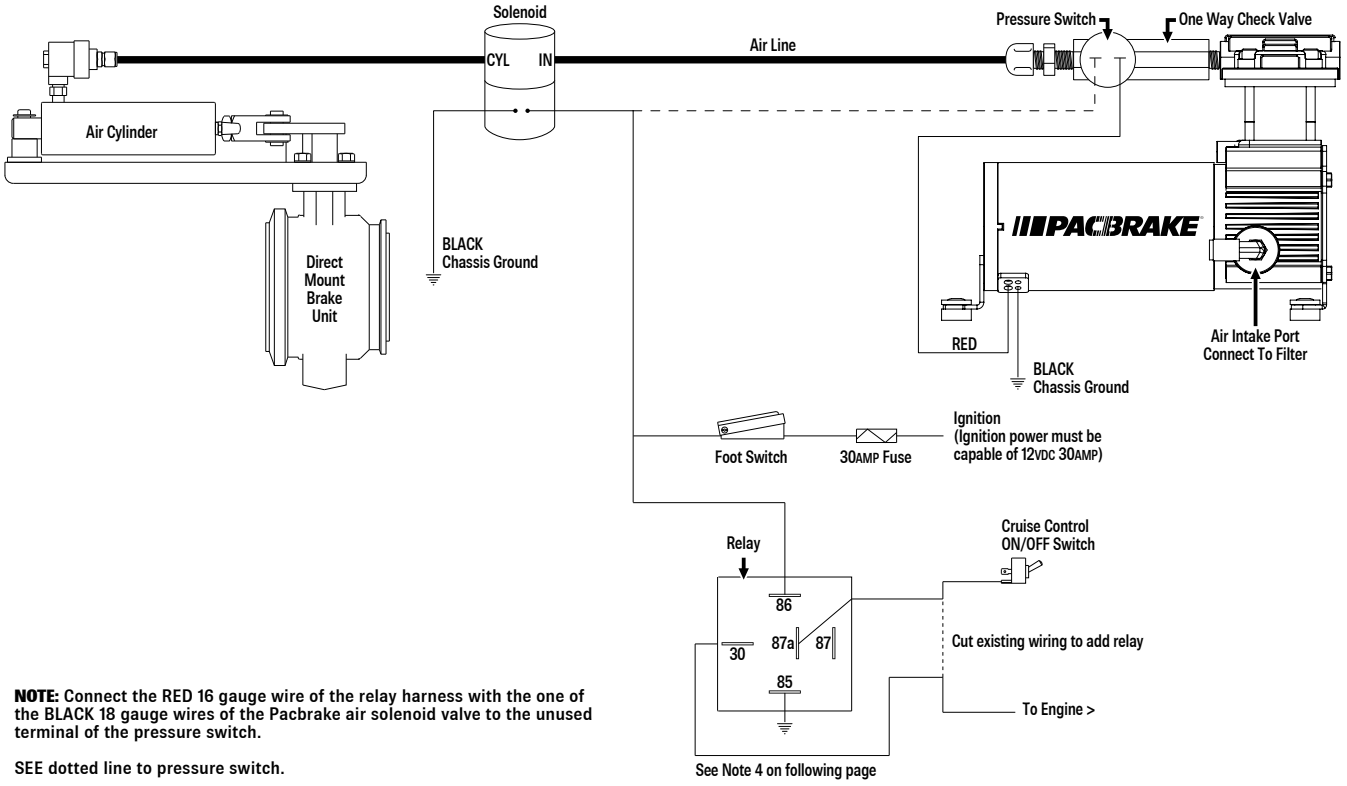
8C INSTALLATION FOR CATERPILLAR 3116/3126 mechanical engines:

Install the throttle switch assembly to the firewall with the switch arm horizontal and behind the throttle linkage as shown.

Adjust the switch by loosening the screws and positioning it to "click" as the throttle returns to it's released position. Cycle the throttle and listen for the click each time the throttle returns to idle. Tighten screws when adjustment is complete.



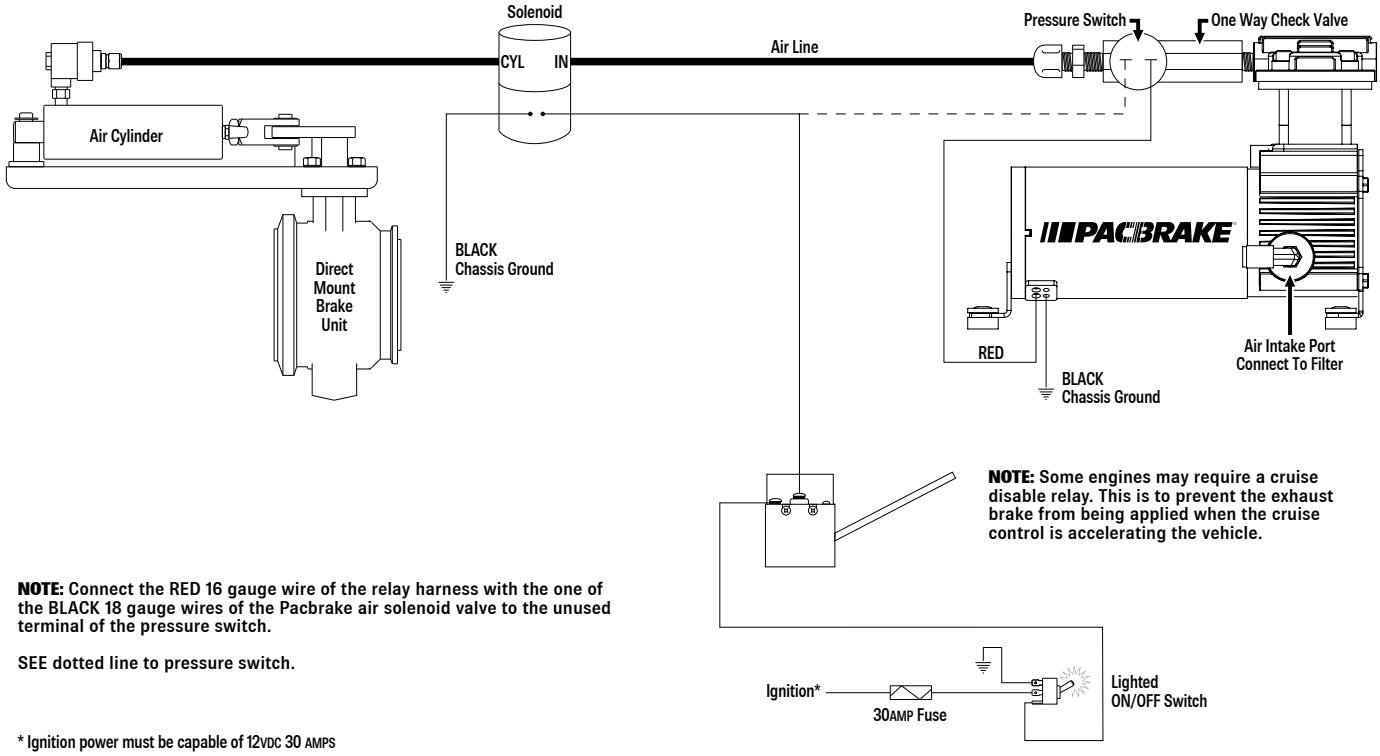
Schematic A - Optional Foot Switch Installation



NOTE: Connect the RED 16 gauge wire of the relay harness with the one of the BLACK 18 gauge wires of the Pacbrake air solenoid valve to the unused terminal of the pressure switch.

SEE dotted line to pressure switch.

Schematic B - Throttle Switch Installation - mechanical engines only



NOTE: Some engines may require a cruise disable relay. This is to prevent the exhaust brake from being applied when the cruise control is accelerating the vehicle.

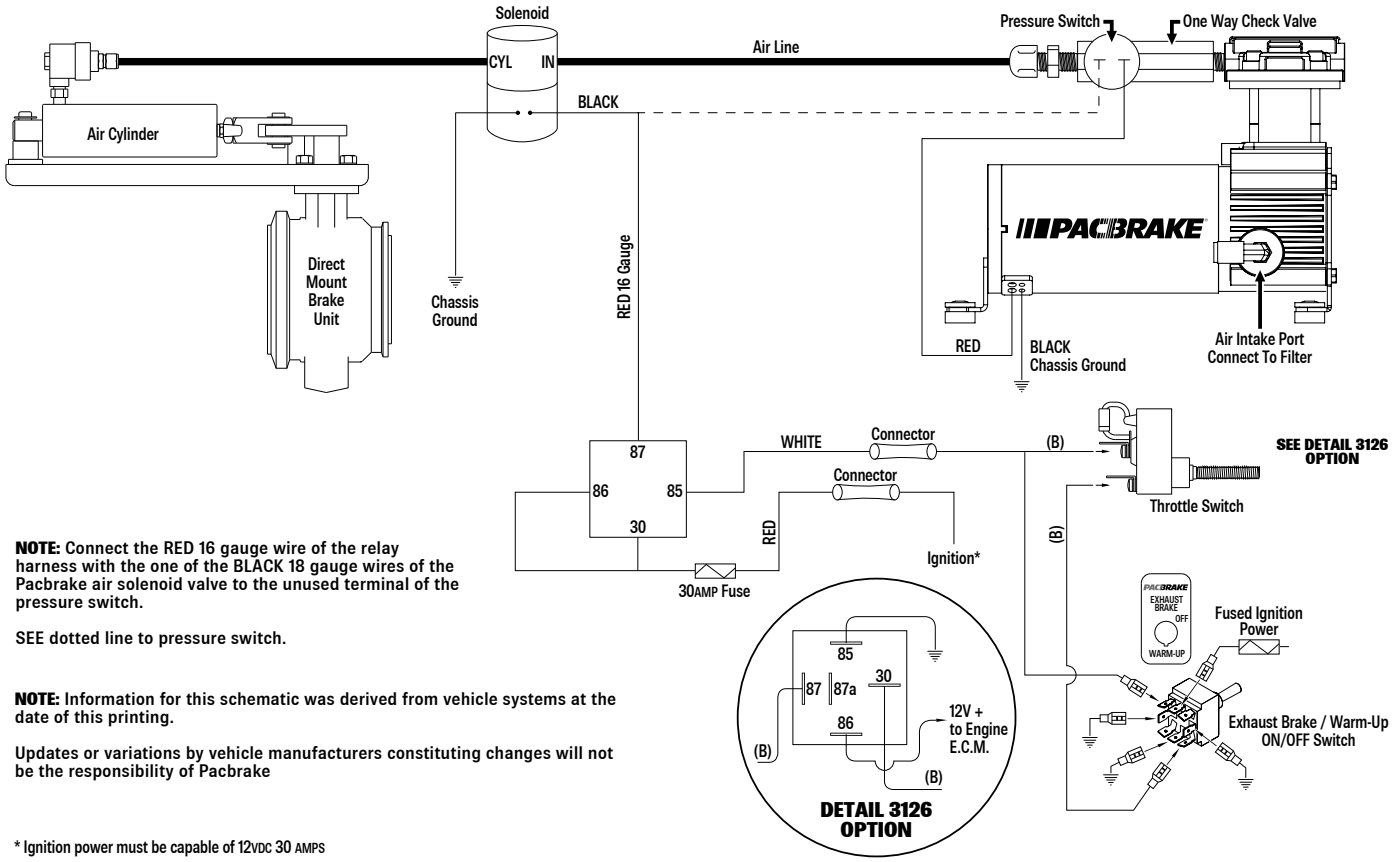
NOTE: Connect the RED 16 gauge wire of the relay harness with the one of the BLACK 18 gauge wires of the Pacbrake air solenoid valve to the unused terminal of the pressure switch.

SEE dotted line to pressure switch.

* Ignition power must be capable of 12VDC 30 AMPS

Schematic C - Caterpillar 3116/3126 Installations

GROUND CIRCUIT APPLICATIONS WITH WARM UP OPTION (C12011 Exhaust Brake Kit)



NOTE: Connect the RED 16 gauge wire of the relay harness with the one of the BLACK 18 gauge wires of the Pacbrake air solenoid valve to the unused terminal of the pressure switch.

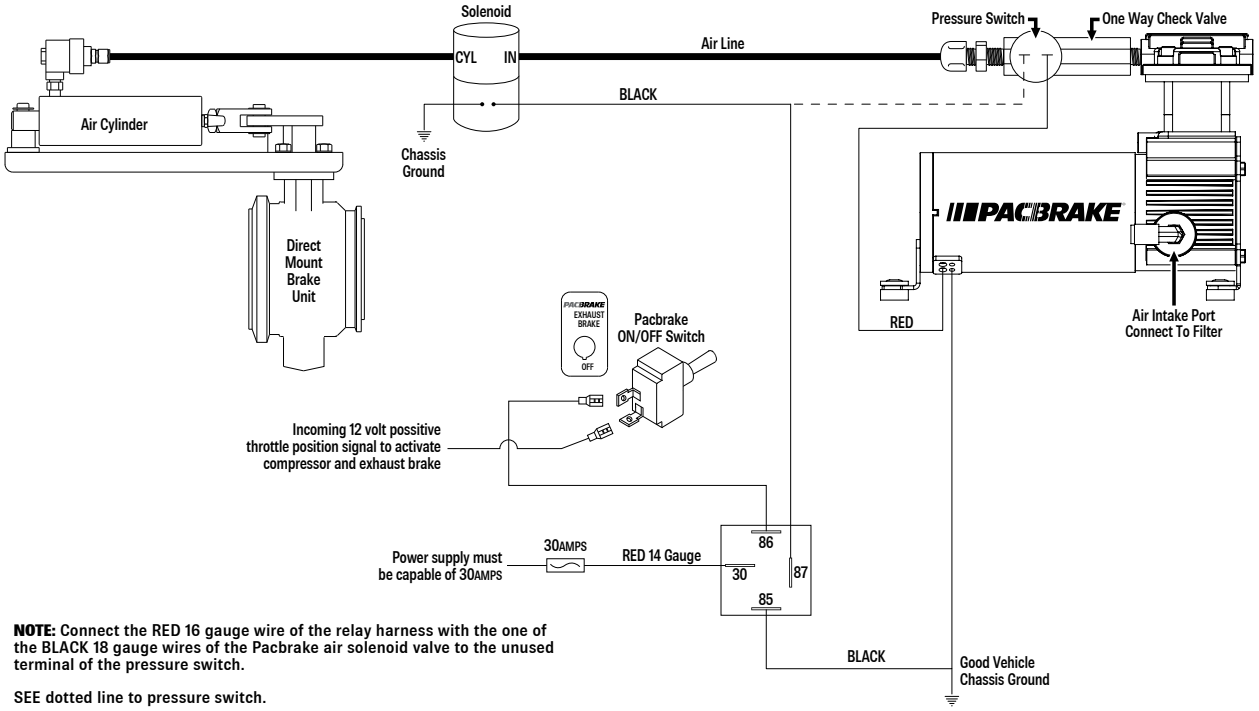
SEE dotted line to pressure switch.

NOTE: Information for this schematic was derived from vehicle systems at the date of this printing.

Updates or variations by vehicle manufacturers constituting changes will not be the responsibility of Pacbrake

* Ignition power must be capable of 12VDC 30 AMPS

Schematic D - Electronic Engines With Manual Shift Transmissions

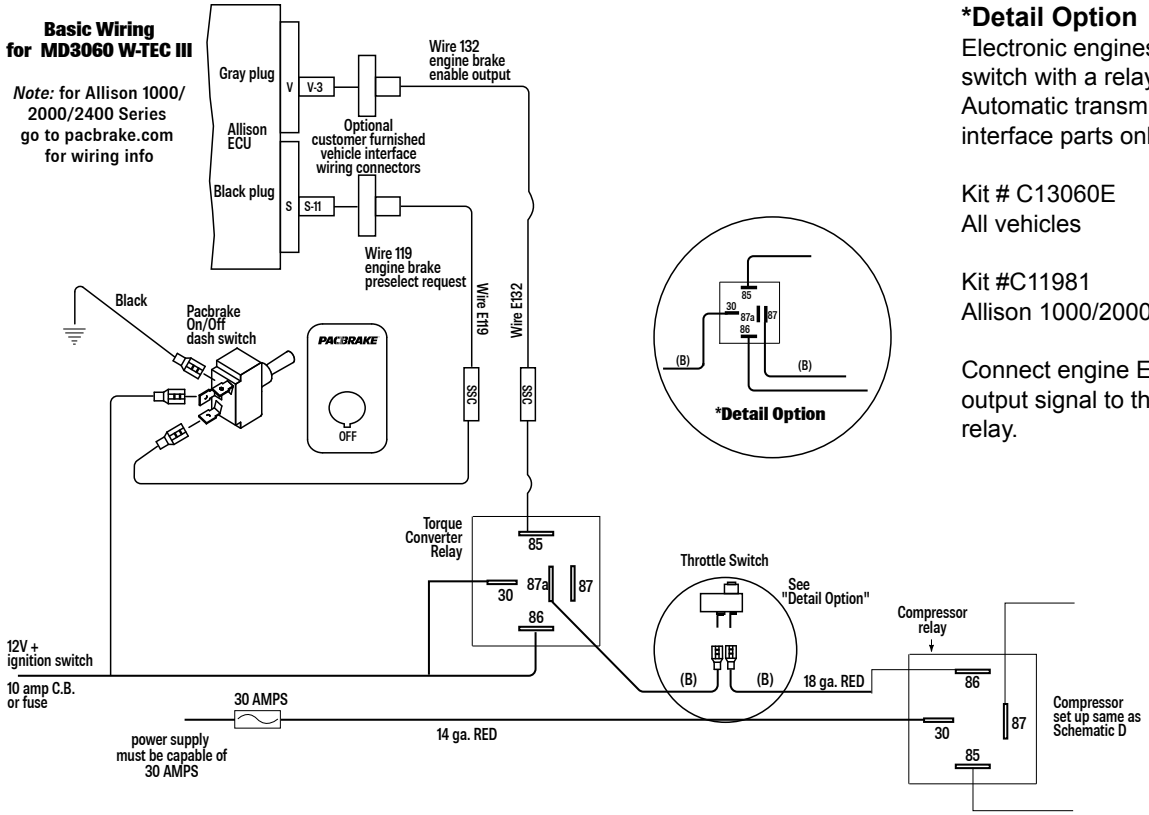


NOTE: Connect the RED 16 gauge wire of the relay harness with the one of the BLACK 18 gauge wires of the Pacbrake air solenoid valve to the unused terminal of the pressure switch.

SEE dotted line to pressure switch.

Schematic E - Allison MD3060 WTEC III Transmission Interface

Note: Below is a sample of a specific Allison Transmission Interface. Verify your model of transmission BEFORE making any connections.



***Detail Option**
Electronic engines replace throttle switch with a relay. Automatic transmission interface parts only.

Kit # C13060E
All vehicles

Kit #C11981
Allison 1000/2000/2400 Series

Connect engine ECM throttle output signal to the coil side of the relay.

Testing The System

These Air Control Groups are designed to provide air for exhaust brake actuation “on demand”. The following tests should be performed with the vehicle’s engine OFF and ignition ON.

Foot Switch Control Group - Schematic A

1. Depress foot switch – compressor comes on and exhaust brake is actuated. Compressor will remain on momentarily until full pressure in the air cylinder is reached. Compressor will shut off, exhaust brake will remain on.

2. Release foot switch – air pressure is exhausted through the quick release valve and exhaust brake returns to “off” position.

3. If a cruise control relay has been installed, a road test will be required to test brake and cruise interface.

4. A throttle switch or throttle position relay should be installed to prevent the exhaust brake from being applied when engine is under power.

Throttle Switch Control Groups - Schematic B and C

1. Turn dash switch on – compressor comes on and exhaust brake is actuated. Compressor will remain on momentarily until full pressure in the air cylinder is reached. Compressor will shut off, exhaust brake will remain on.

2. Apply slight pressure to the throttle pedal air pressure is exhausted through the quick release valve and exhaust brake returns to “off” position.

Electronic Engines Control Group - Schematic D

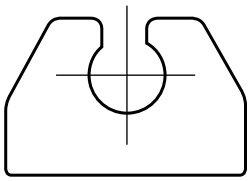
1. Turn dash switch on, increase engine RPM to Governor and quickly release throttle. Compressor comes on and exhaust brake is actuated. The engine ECM will turn the exhaust brake off below 1000 RPM. Some engine ECM’s require the service brakes be applied before the exhaust brake will apply. Consult OEM for specific requirements.

Allison Electronic Transmission - Schematic E

1. A road test must be performed to test the exhaust brake. The torque converter relay will disable the exhaust brake when the vehicle is stationary. During the road test, turn the Pacbrake switch on, then release the accelerator pedal. If the vehicle is in 5th Gear or higher the transmission should downshift and the exhaust brake apply. Depress the accelerator and the exhaust brake should release and the transmission should upshift normally.
   * Pre 1992 transmissions may require programming, later versions can be reprogrammed to either 4th gear downshift or 2nd gear downshift, this must be done by an Allision Transmission dealer.

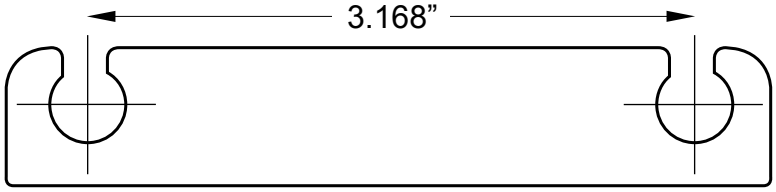
NOTE: Exhaust retarder units can be ordered preset from the factory with the correct back pressure setting and no road test is required. Units NOT preset will require a road test and back pressure adjustment. Refer to the application information for the correct engine manufacturers specified back pressure, and follow the adjustment instructions from the standard installation manual (Form L2009).

Compressor Mounting Template



This copy may have been altered from it's original size. Please use the measurements as a reference.

7.584”



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