LINGENFELTER
PERFORMANCE ENGINEERING

1997-2004 C5 Corvette
Lingenfelter Battery Relocation Kit
Installation Instructions

(Standard and lightweight versions)

PN: L450010197 (lightweight)
PN: L450020197 (standard)

1557 Winchester Road
Decatur, IN 46733
260-724-2552
260-724-8761 FAX
www.lingenfelter.com

The LPE C5 Corvette battery relocation kit improves vehicle weight distribution by moving weight to the rear of the vehicle. The improved weight distribution increases traction for better acceleration along with providing improved handling and braking. The battery relocation kit also provides space in the engine compartment for intercooler water tanks and other vehicle additions. The installed kit safely mounts the battery in the rear storage well of the Corvette and, in those applications equipped with the storage well cover, fits under the existing rear storage well cover for a clean and stock appearance.

For added safety, the LPE battery relocation kit is designed to mount to the frame of the vehicle in four places and also includes a sealed battery box with an external vent tube. The relocation kit is NHRA and IHRA accepted and is also legal for use in SCCA classes that allow battery relocation. The kit includes all necessary hardware for installation. The standard kit utilizes heavy-duty 1/0 gage battery cables to minimize voltage drop. The light-weight kit uses 1 gage battery cables and uses the frame as the ground cable, significantly reducing the weight of the system. The light-weight kit is recommended for drag racing and road racing applications that will not see high battery current drain from cold starts or high power stereos or other accessories.

The LPE battery relocation kit is designed to fit all body styles of the 1997 to 2004 C5 Corvette. The battery box will accept most stock and aftermarket Corvette batteries but does not accept the larger and heavier, early style 78H-6YR batteries. The cables in the kit are designed for side post batteries. If you have a Corvette with the newer top post battery, you will need to change the battery cable terminal ends, install side post adapters or change to a different battery. Compatible batteries include:

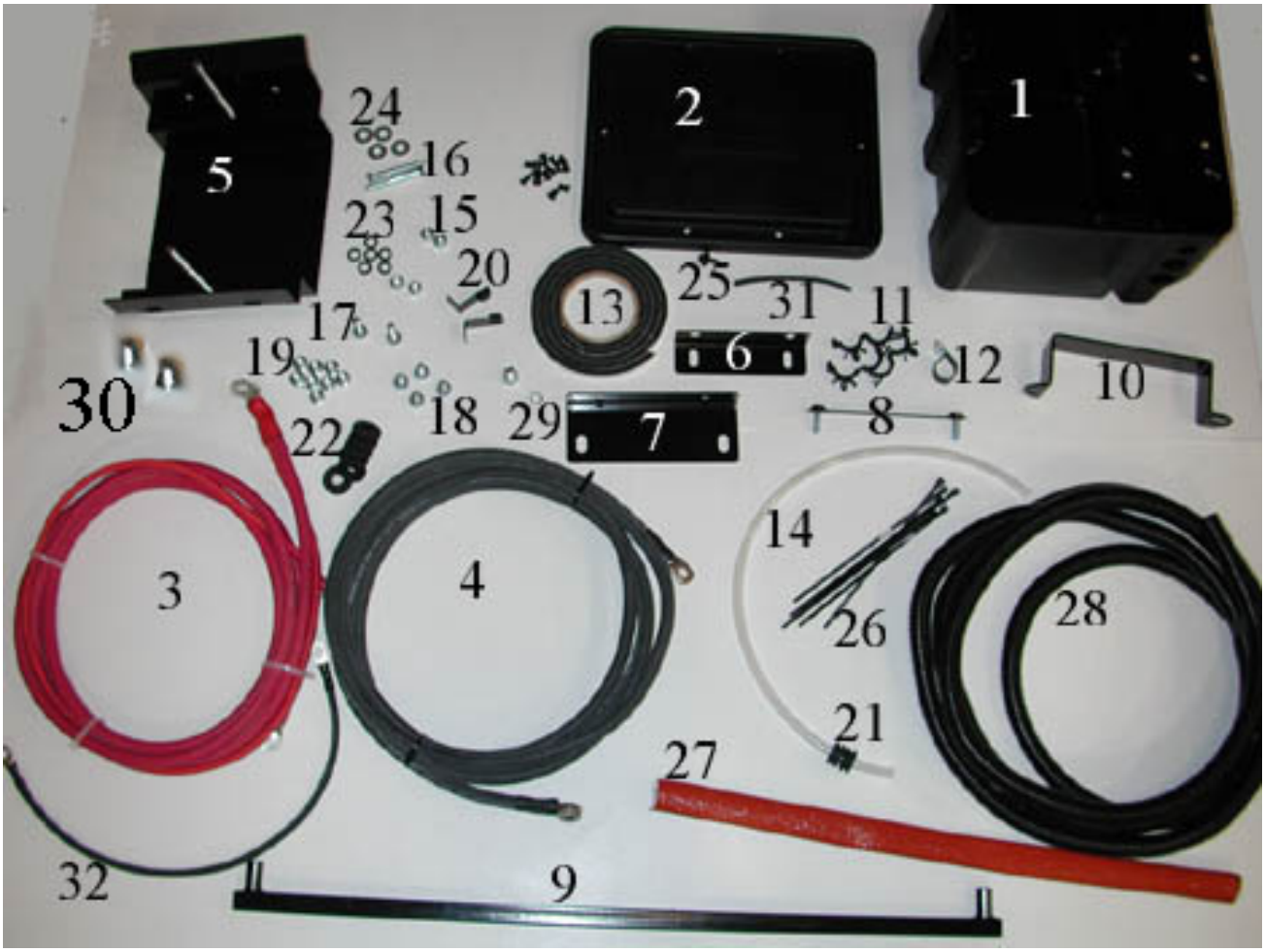
- AC Delco 75-7YR (35.3 lbs)
- AC Delco 75P-7YR (35.3 lbs)
- Optima 8004-0003, model 34/78 (38.8 lbs)
- Optima 8022-091, model 75/35 (33.1 lbs)

Parts List

#	Part #	Description	Bag Section	Item #
1	LN4226-001	battery box	NA	1
1	*(part of battery box)*	battery box lid	NA	2
6	93040A104	push/pull clamps for lid *(part of lid assembly)*	NA	2
1	H212607WCR-13.4	positive cable, #1 gauge x 13.4', red *(LW kit)*	NA	3
1	H102609CRD-13.4	positive cable, 1/0 gauge x 13.4', red *(STD kit)*	NA	3
1	H102609WCB-15	full length negative cable, 1/0 gauge x 15', black *(STD kit)*	NA	4
1	LN4226-003	battery box cradle bracket (battery tray)	NA	5
1	LN4226-006	angle bracket with 4 slots, black	NA	6
1	LN4226-007	black angle bracket with 2 slots and 2 holes, black	NA	7
1	LN4226-008	stud plate, black	NA	8
1	LN4226-005	square tube with stand-offs at each end, black	NA	9
1	LN4226-004	battery hold down bracket	NA	10
3	AV 14547	plastic wire loom holder	3	11
1	AV 9387	metal loom holder	3	12
5'	R538	rubber/foam seal lid to box, black, 5/16 x 3/8" x 5'	NA	13
14"	5231K171	PVC tubing, 0.5" OD, clear	6	14
2	MMC 95615A140	3/8-16 Nylock nut, grade 5	2	15
2	MMC 91247A593	5/16-18 x 2-1/2" hex head cap screw, grade 5	1	16
2	MMC 92323A539	5/16-18 x 1-1/4" serrated flange cap screw	1	17
4	MMC 92323A535	5/16-18 x 3/4" serrated flange cap screw	1	18
8	MMC 94831A030	5/16-18 serrated flange nut	1	19
2	LN4226-009	L bracket, 5/16" x 18 nut welded to retainer	3	20
2	EST-0653-25012	grommet, 1/2" ID x 3/4" groove	2	21
4	EST-2983-006	grommet, 1/2" ID x 1" groove	2	22
4	MMC 90130A031	rubber washer, 3/8" x 0.093"	2	23
5	90108A415	5/16" flat washer, 3/8" ID & 7/8" OD	5	24
1	AV 12351	black sheet metal screw	3	25
5	MMC 7134K3	black cable tie, 8" long	6	26
24"	791201128	24" X ¾" flame guard heat sleeve	NA	27
14'	1769	3/4" black slit loom, 14'	NA	28
1	MMC 91280A626	M10x1.5x20mm bolt	4	29
1	91114A031	external-tooth lock washer 3/8" screw size	4	29
2	92865A624	3/8-16 x 1" hex bolt	5	30
2	91114A031	external-tooth lock washer 3/8" screw size	5	30
2	MMC 95462A031	3/8" hex nut, grade 5	5	30
1	8507K141	black edge trim, 5" long, notched	6	31
1	H61813HDWCB-21	chassis ground cable, #6 gauge x 21", black *(STD kit)*	NA	32
1	H11833HDWCB-21	negative cable, battery to frame, #1 gauge x 21", black *(LW kit)*	NA	33
1	H1833HDWCB-12	negative cable, frame to engine, #1 gauge x 12", black *(LW kit)*	NA	34
2	1101	battery cable side mount bolt	5	35
2	MMC 95462A031	3/8" hex nut, grade 5	5	*Not shown*
1		installation instructions	NA	*Not shown*
1	L920010000	LPE decal	NA	*Not shown*

(Picture of parts and corresponding Item Numbers on next page.)

*Item # 30 only used on light-weight kit (*L450010197*). Will be excess parts on standard kit.*

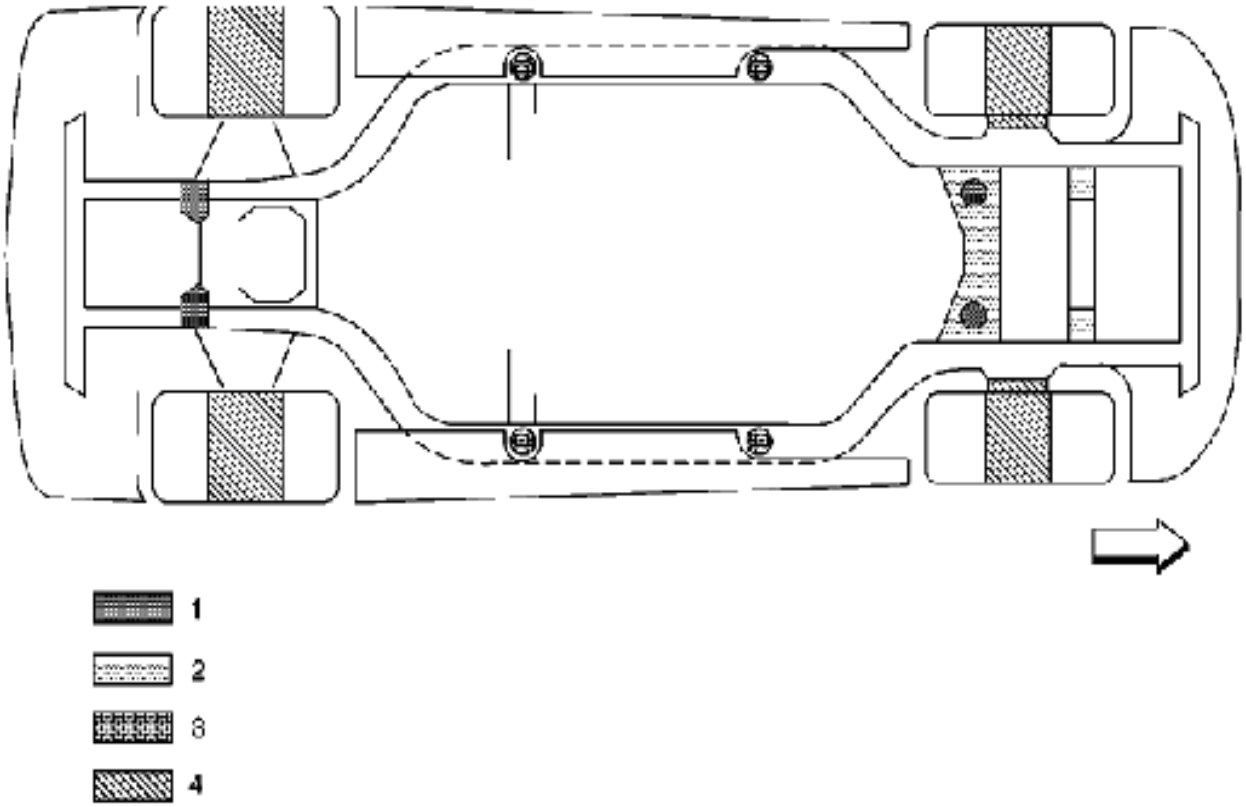


Tools and Materials Needed

- hole saw, step drill, or wood bit to drill holes with diameters of ¾” and 1-1/16”
- scissors
- razor blade knife
- sand paper
- Phillips and flathead screwdrivers
- needle nose pliers
- hole saw (1 ½”)
- WD40
- Magic Marker
- tin snips
- drill bits (21/64” and 9/32”)
- electrical tape (or self fusing silicone tape)
- flathead screwdriver
- standard / metric socket set
- tape measure
- 3/8” or ½” electric drill
- ½” end wrench
- 5/16” end wrench
- 9/16” end wrench
- hoist or vehicle jack and jack stands
- torque wrench (to tighten lug nuts)

WARNING - the light-weight version of this kit requires welding to the frame of the vehicle. If you do not feel comfortable performing this operation we recommend the standard version of the kit or that you have the kit installed by a qualified shop.

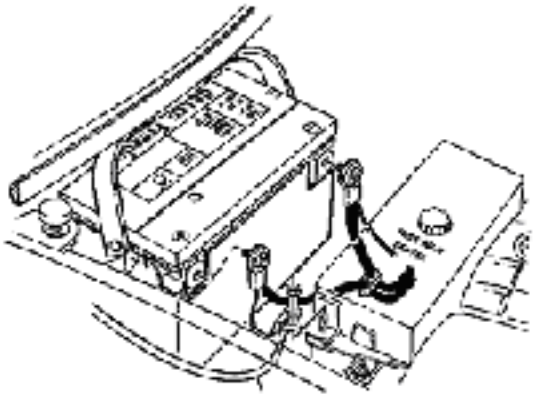
Raise the vehicle on an automotive lift or with jack stands at the points recommended by the manufacturer. Refer to the owners manual or a shop manual for further specifications. To avoid any vehicle damage, serious personal injury, or death, when major components are being removed from the vehicle and the vehicle is supported by as hoist, support vehicle with jack stands at the opposite end from which the components are being removed.

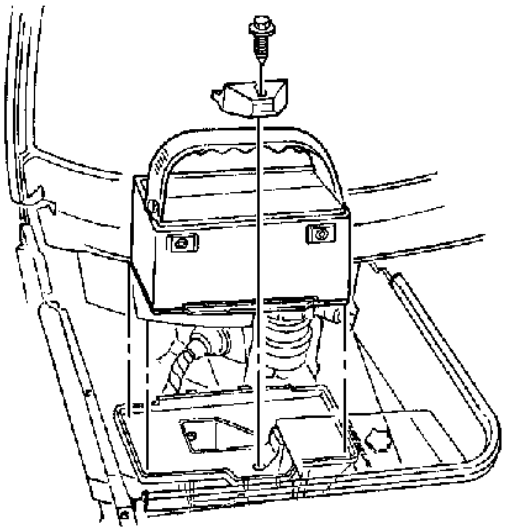


1. Preferred Vehicle Jacking Locations
2. Optional Vehicle Jacking Locations
3. Frame Contact Hoist Locations, Optional Vehicle Jacking Locations
4. Suspension Contact Hoist Locations

Remove the right rear tire.

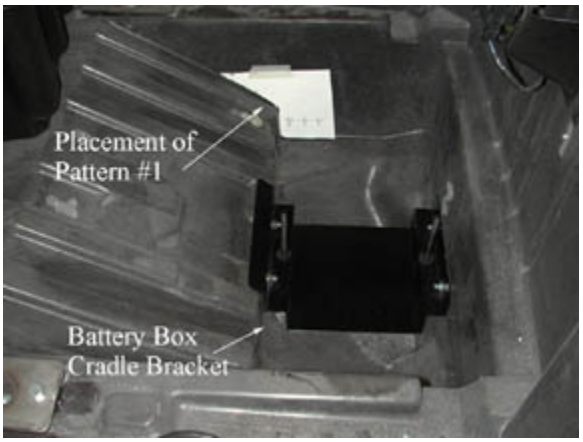
Remove the battery and remove from the car. Always turn the ignition OFF when connecting or disconnecting battery cables, battery chargers, or jumper cables. Failing to do so may damage the Powertrain Control Module (PCM) or other electronic components.





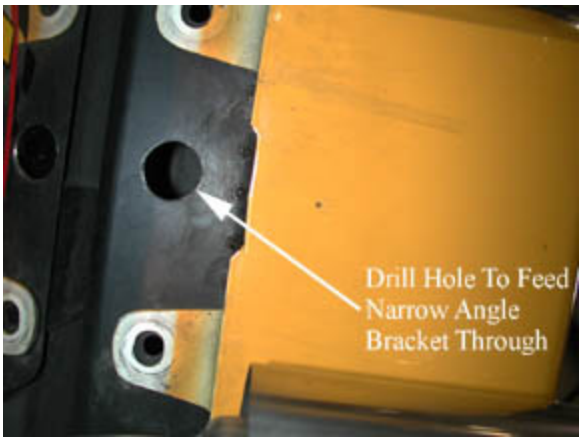
1. Disconnect the negative battery cable.
2. Disconnect the positive battery cable.
3. Remove the battery hold down retainer bolt.
4. Remove the battery retainer.
5. Remove the battery with the insulator from the tray.

Remove carpet in rear of car to expose the fiberglass tub area in the center and rear of car.



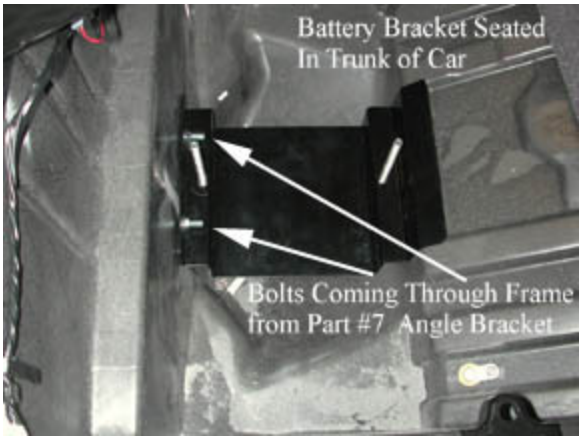
Cut out the supplied pattern labeled “Pattern 1” (found on page 14). Lay it in the right side of the tub section inside of the car. It should fit the contour of the fiberglass. Mark the three hole centers and drill to the proper size. The size of the holes that are being drilled are specified on “Pattern #1.” There are two holes that are 1 1/16 inches in diameter and one hole that is ¾ inches in diameter. If you don’t have a step drill, a spade wood bit will work. Drop the carpet back in location and mark the three holes onto the carpet from outside the car. Remove carpet and cut or punch the three holes. Cut the carpet according to the “Carpet Cutting” instruction sheet.

From underneath the rear of car, remove the two center fasteners that hold the fascia to rear metal bumper. Using a hole saw, drill a hole approximately 1-½ inch hole that is centered between the two fascia mounting holes.

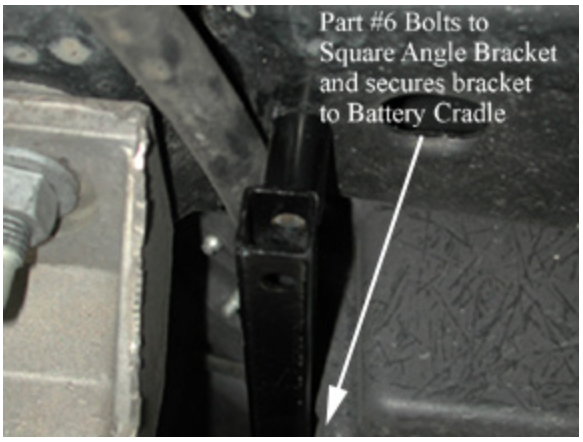


Find the black narrow stud plate that has two 5/16" bolts welded to it (part #8), insert it into the 1-½ inch hole and drop the studs through the fascia mounting holes. (Needle nose pliers can make this easier.)

Locate the black angle bracket that has two slots and two round holes (part #7). Place the slots over the studs. You will have to pull the fascia downward to install this bracket so that it directly contacts the frame. Let the fascia go back onto the studs. Use flat washers and nuts to snug bracket, slide bracket tight against the fiberglass tub, tighten nuts.

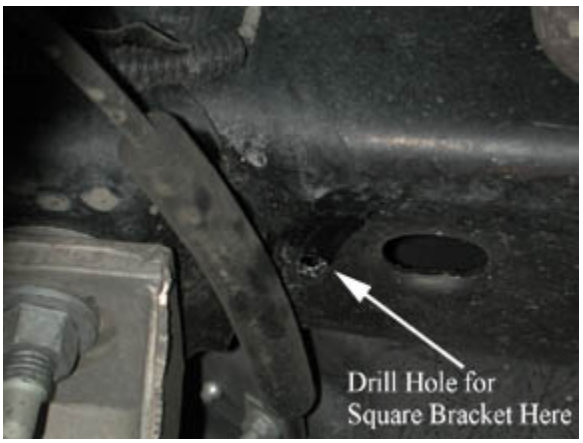


Drill 21/64 inches through the two holes on the bracket through the fiberglass; make sure carpet is out of the way. Place the black battery tray with 4" studs (part #5) in the fiberglass tub. It should be lined up with the holes you have drilled. From the exterior, install 5/16" x 3/4 serrated flange bolts and put nuts on battery tray side, then snug, but do not tighten the nuts.



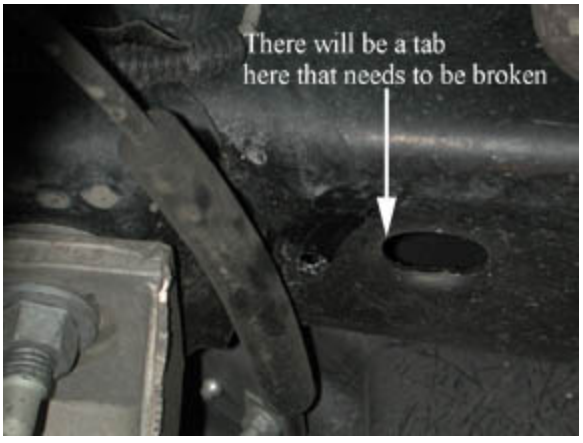
Center the battery tray in tub. Then drill 21/64 inches through the two holes in the front of the battery tray. Locate the black angle bracket with four slots (part #6). Using two 5/16”x18”x 3/4” (part #18) serrated flange bolts, install the bracket from underneath the car. The horizontal leg of the angle bracket should be to the bottom. Install 5/16 inch nuts (part #19) from inside the car, make these nuts snug, but do not tighten.

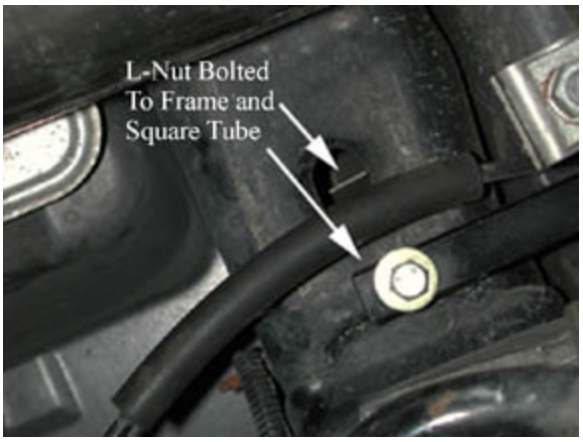
Locate the black square tube with stand-offs on each end. This tube should slide in from underneath the car and sit on top of the angle bracket. The stand-offs should be in contact with the frame on both sides. The small round tubes have been welded off-center to clear the sub-frame mounting weld. Drop in the two 5/16”x18x1-1/4 bolts (part #17) from the top to secure the square tube to the angle bracket. Install two 5/16-inch nuts (part #19) finger tight.



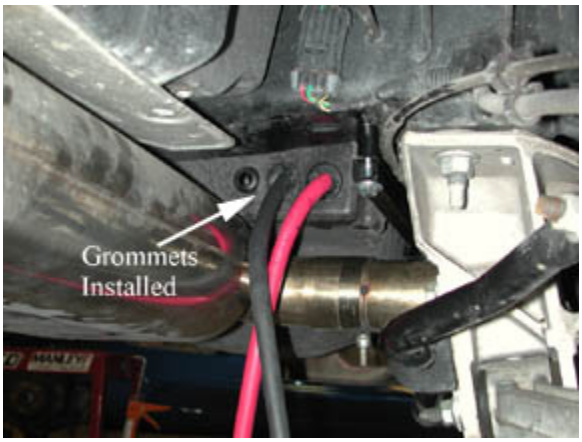
Make sure the stand-offs are sitting flat against the frame. If the stand-offs hit the weld, sand a small bevel on the standoff. Then transfer punch through the stand-offs to mark the frame for drilling. Remove the square tube and drill the frame 21/64 inches in the two marked places.

On the frame rails directly behind the hole you just drilled, you will see that the slotted hole still has the punched slug still attached to it. You will need a Phillips screwdriver to pry it over. Now go through your 21/64 inches hole with the Phillips screwdriver and push it the other way. Work it back and forth until it breaks off.





Reinstall the square tube member, but do not tighten it. Locate the two black "L" nuts (part #20). These will go in the slots on the frame rails. Hold in place with needle–nose pliers while installing the 5/16"x18"x2-1/2 (part #16) bolts with flat washer. Tighten these bolts securely. Now tighten all other bolts/nuts previously installed. On the right side, use a blunt object to bend the L nut so it is flush with the frame, this is where a battery cable will pass.



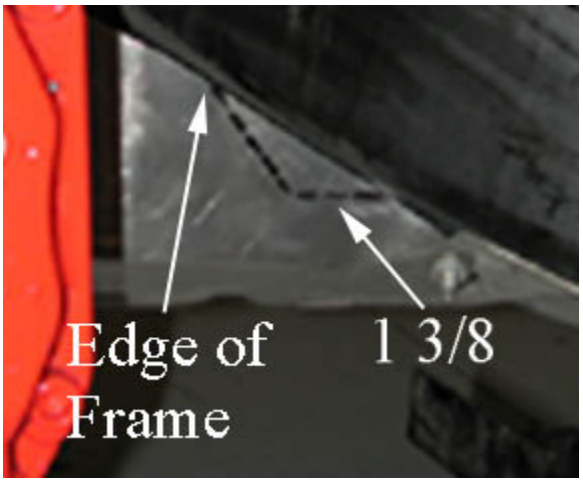
From outside of the car, route the round end of the positive (red) cable (part #3) through the 1" hole in the fiberglass panel that is located towards the front. Spray a large grommet (part #21) with WD40 and from inside the car, force it over the cable end and work it into place on the fiberglass. On the standard kit, repeat with the negative cable (part #4). The lightweight kit uses the frame as the ground path.

Now install the smaller rubber grommet (part #21) in the remaining hole. Work carpet back into location feeding the cables through the proper holes as marked on "Pattern 1". Place two rubber washers (part #23) on each stud of the metal battery tray. Work them down to the bottom so they seat against the tray. Now install the plastic battery box (part #1) by sliding it down over the studs and making sure it is seated to the lowest point. Install a regular 3/8"x16 nut on each stud and run it down to the plastic. Tighten snuggly but do not over-tighten. If studs appear to be leaning outward straighten by grabbing the upper edges of the battery box and adjusting as necessary.

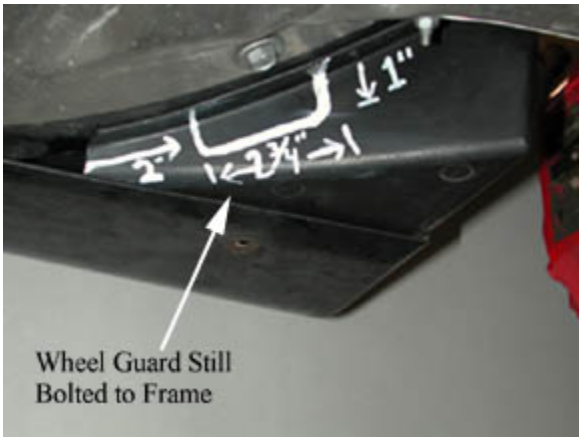
Now route the positive cable through the bottom hole of the box and install grommet (part #22). Repeat for the negative cable. Install the smaller remaining grommet (part #21) in the top hole. Install the battery and slide cables in or out to achieve proper length but do not fasten to battery. Make sure they are not resting against the battery and creating a "hot cable." Install black bracket that holds down the battery (part #10). The slotted hole in this bracket will go towards the front of the car for that hole we will use a flat washer (part #24) and a Nylock nut (part #15). Use just a Nylock nut on the rear stud, tighten snuggly but do not over-tighten.

When installing the clear plastic tube (part #14), it should go through both of the smaller grommets so that it protrudes inside the battery box a few inches and outside the fiberglass at least one inch.

Mark the gas tank shield as shown. The line should start at the point where the shield is approximately flush with the frame rail. Extend downward until about 1 3/8 inch up from the horizontal break; draw a line horizontally staying 1 3/8 inches from the break.

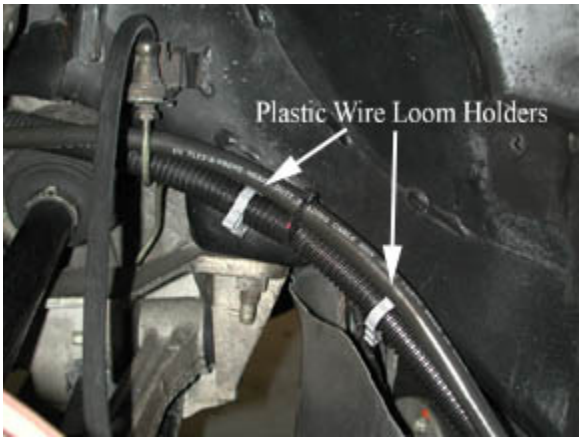


Mark the inner fender liner as shown; this will be your wire routing. Remove the gas tank shield and cut with tin snips. Use the supplied, pre-cut black piece of edge protector (part #31) on the shield, this must be installed to prevent cutting of the battery cable. Remove the inner fender liner and cut as marked. Install the gas tank shield but leave the fender liner out for now. For the LPE minitub kit, cut a notch of the same width and height in approximately the same location shown here.



Install the black slit loom (part #28) over the positive cable from where it exits the fiberglass. Continue loom on the positive cable until you are about 24 inches from the 90° lug, cut loom with scissors, then use electrical tape to seal loom to cable at this point.

This is the most critical portion of the install. The red cable will be clamped at all clamping points. Directly under the right rear upper A-arm there is a loom and a plastic loom holder (part #11). Use a screwdriver to unsnap the loom and pry out the loom holder. Replace it with one of the supplied large loom holders. Clamp the red cable in the loom holder that you have just installed. Cable tie the factory loom to the positive cable, if you have a full length ground cable (part #4) it will also tie here. Continue winding the cables forward.

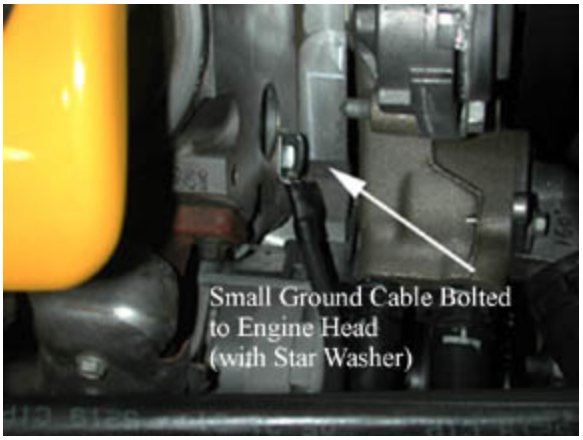


On the front of the shock mount bracket welded to the frame, there is a hole on the bottom side of the forward edge, which is 3/16 inches in diameter. Find the metal loom holder and the sheet metal screw with the 10 mm head (part #25). Place the metal loom holder on the red cable oriented so that the cable is being held inboard and tighten screw.

Continue the cable(s) forward through the opening between the frame rail and brake line. On the sub frame mounting pad about 3 inches forward of the brake line you will see a hole approximately 3/16 inches diameter. Drill this out to 9/32 inches and install a plastic loom holder. Clamp the red cable to the loom holder. Approximately 4 inches forward of this clamp, and as low as possible on the frame, drill another 9/32 inches hole. Install a plastic loom holder and clamp the red cable. Your routing should look like the pictures shown**. Make sure the red cable is not near anything that may penetrate the cable.**

Standard Cable Installation:

Vehicles with the standard (full length) ground cable will bolt to the engine block in place of the original ground cable. With this configuration you will need to install the supplied 21" #6 black ground cable (item # 32)



Use the M6x1 ground stud on top of the frame rail directly under the A/C charge port. This is about even with the front edge of the coolant reservoir. Attach the end with the smaller hole. Attach the other end to the front of the cylinder head using the M10x1.5x20mm bolt and star washer supplied (item # 29).

Lightweight Cable Installation:

Vehicles with the light-weight cable configuration will require a 3/8"x16x1 bolt (part #30) welded in the rear and front sections. The rear ground bolt should be located on the bottom of the frame about 5 inches back from the rear of the aluminum sub frame and as far to the outside of the frame as possible while remaining on the flat surface. The head of the bolt should be sanded flat before welding and the paint must be sanded off of the frame in area to be welded. **Disconnect the PCM before welding on chassis.** Weld the bolt continuously around so moisture does not get between the bolt and the frame.

The front ground bolt should be located under the coolant reservoir on top of the frame surface about 1 inch forward of the strut tower bracket. It should be prepped as explained for the rear ground bolt. TIG welding is recommended to minimize chance for fire or damage to surrounding parts. Use the 12 inch ground wire to go from your front ground stud to the front of the head. Install a star washer and 3/8"x16 nut on the ground stud, use the supplied M10x1.5x20mm bolt and star washer (item # 29) to secure to the front of the cylinder head. Use a star washer and a 3/8"x16 nut to secure ground to frame on the rear.

Remove the plastic panel behind the right front tire. This can be achieved more easily when you take the tire off.

Remove the stock battery tray from the engine compartment, noting that it is bolted from the center outward. Route the cable(s) forward from the rear fender well until they come out of the front fender well area. Cable(s) should route above the PCM (Powertrain Control Module) as shown.

Slide the heat sleeve (part #27) over the positive cable, using electrical tape or self fusing silicone tape to secure it. Once the cable(s) have reached the stock battery location they will take the route of the stock cables. The supplied heat shield should be used on the positive (red) cable from the starter lug back. Use cable ties to secure cable(s) to loom against firewall. Make sure there is adequate clearance between cable(s) and exhaust manifold. Connect the red wire (part #3) to the lug on the fuse relay center, it should appear similar to the stock wire. Both red and black stock cables should be removed from the vehicle.

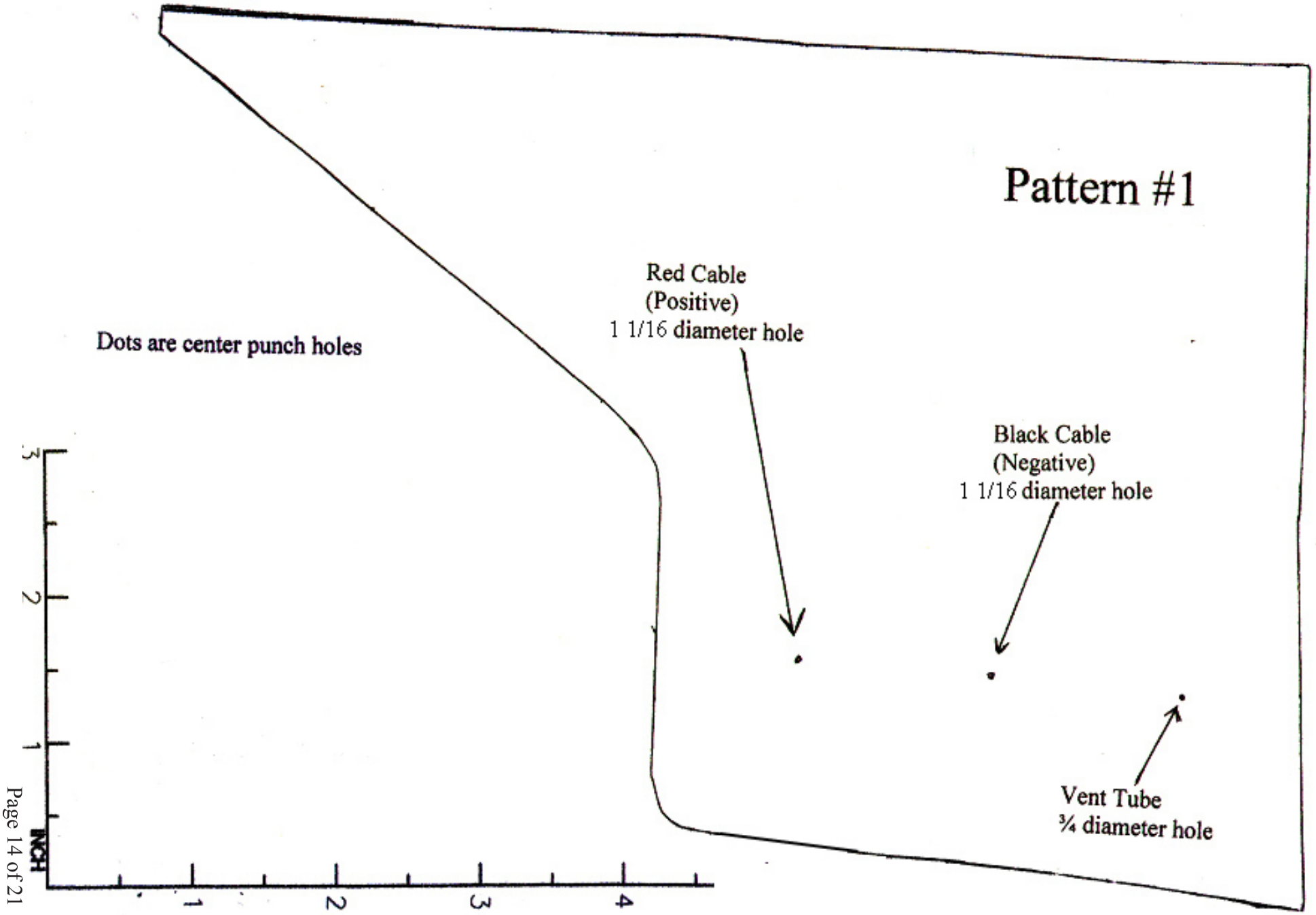
Inside the battery box, make sure you have the red cable go to the positive side of the battery and the black cable to the negative side. Make sure ignition and all electrical switches are turned off. Bolt the cable ends to the battery using the supplied battery lug bolts with 5/16" hex head.

Install the seal in the groove on the lid by starting in a straight area, taking care not to start in a corner. Begin with the end that is already cut at 45°. Work the seal into the groove with something round such as a ballpoint pen or center punch. Do not stretch the seal during installation. This could cause a gap at the overlap after the seal relaxes. When the starting point is reached, cut the seal at a 45° angle to overlap properly. Cut approximately 1/8" long and work the seal in to ensure a tight fit. When installing the lid, it may be necessary to push down firmly on either side of the latch during first installation. The seal will conform to the box after about 15 minutes of being latched.

Reinstall wheel guard, carpet, and any other stock parts that you have taken off during this installation. Check connections on battery cable before starting car.

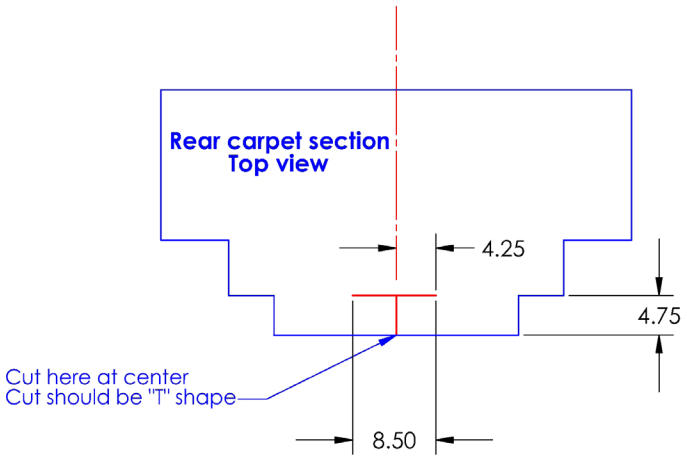
Congratulations - you have completed the installation process.

1557 Winchester Road
Decatur, Indiana 46733
260 724 2552 phone
260 724 8761 fax
www.lingenfelter.com

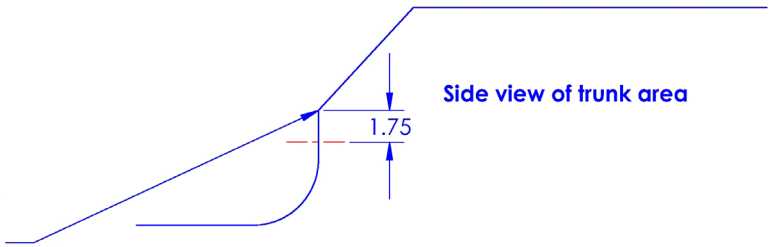

Pattern #1
Red Cable
(Positive)
1 1/16 diameter hole
Dots are center punch holes
Black Cable
(Negative)
1 1/16 diameter hole
Vent Tube
¾ diameter hole
INCH
1
2
3
4

Carpet Installation Instruction
C5 Hardtop (FRC) Corvettes

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED



From here, measure down 1 3/4" & make a horizontal line 8 1/2" long, 4 1/4 each way from the center. Cut from center point, down to end of carpet. You will be cutting a "T" shape just like the other carpet section. When installing the flaps you created by cutting the "T" should go under the metal battery tray. You will have to drill holes in the fiberglass & then reinstall the carpet to mark the holes for cables & vent tubes.



Side view of trunk area

NEXT ASSY	USED ON	
APPLICATION		

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL --
FINISH --

		DATE	NAME
DRAWN	CAJ	1/14/05	
CHECKED			
ENG APPR.			
MFG APPR.			
Q.A.			

COMMENTS:

Lingenfelter Performance Engineering
1557 Winchester Rd, Decatur, IN 46733
P. 260-724-2552

TITLE:
Carpet Installation Instructions
C5 Hardtop (FRC) Corvette

SIZE	DWG. NO.	REV
B		

SCALE: 1:1	WEIGHT:	SHEET 1 OF 1

Carpet Cutting Instructions for C5 Convertibles & Coupe Corvette

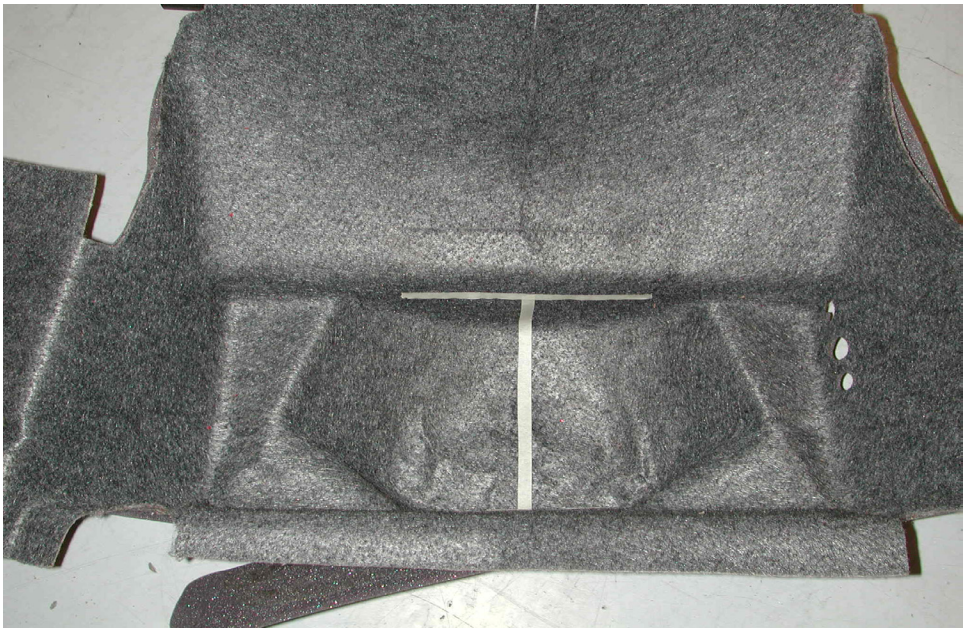


Figure: 1 Top View

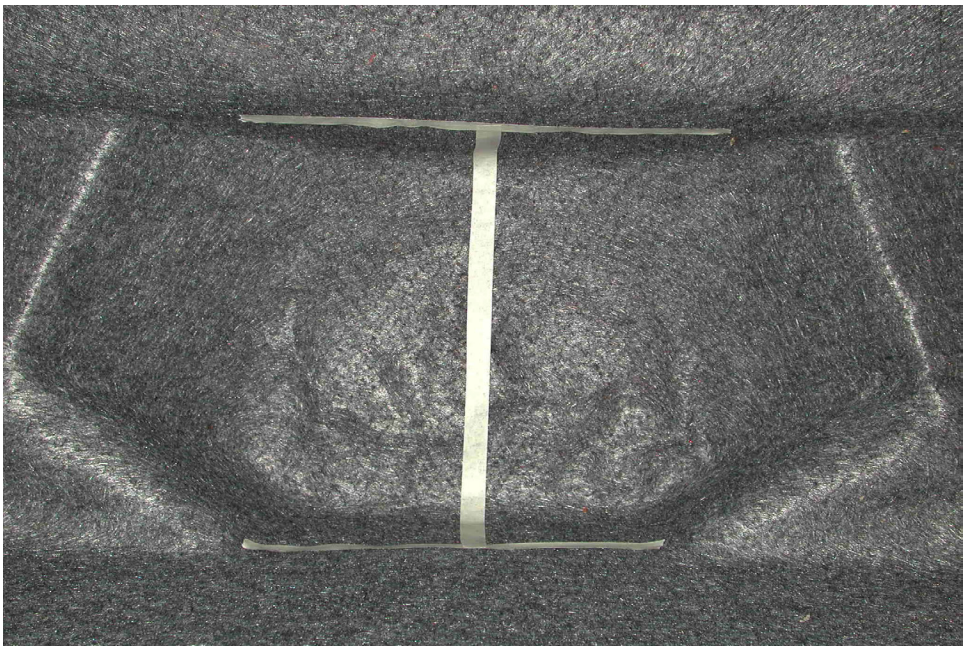


Figure: 2 (Close up of Figure 1)

Figures 1 & 2 are top views of the trunks molded carpet section. The cutting lines are laid out in the shape of the letter "I". This is the pattern your will be cutting to fit your carpet around the battery tray.

NOTE: YOU ARE ONLY CUTTING *SLITS* IN THE CARPET, YOU ARE NOT REMOVING ANY MATERIAL!

Dimensions For Locating Cut Pattern

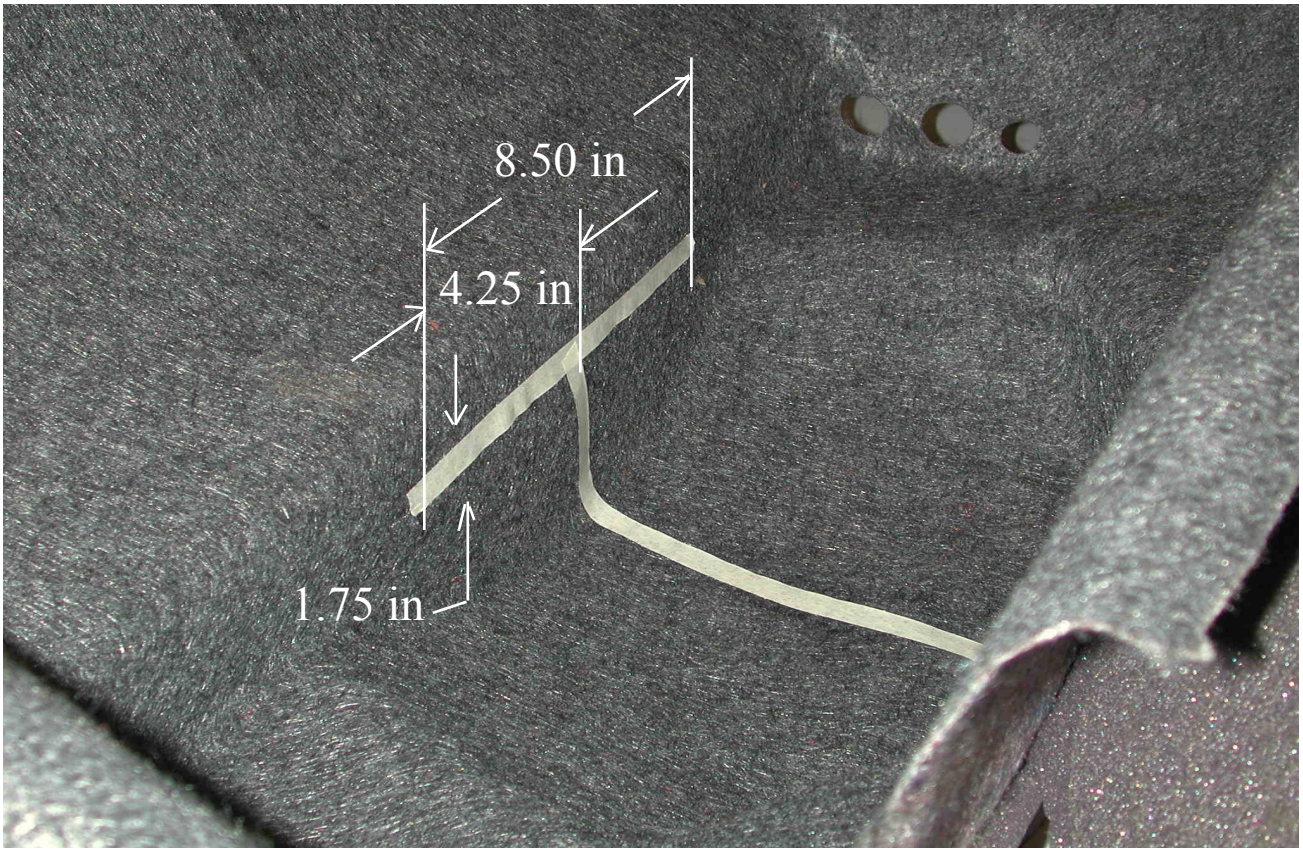


Figure: 3

Figure 3 shows the location of the front slit to cut, the dimension shown is from top of the hump. The 8.50 in dimension is centered as shown by the 4.25 in dimension and in figures 1 & 2.

Dimensions Continued

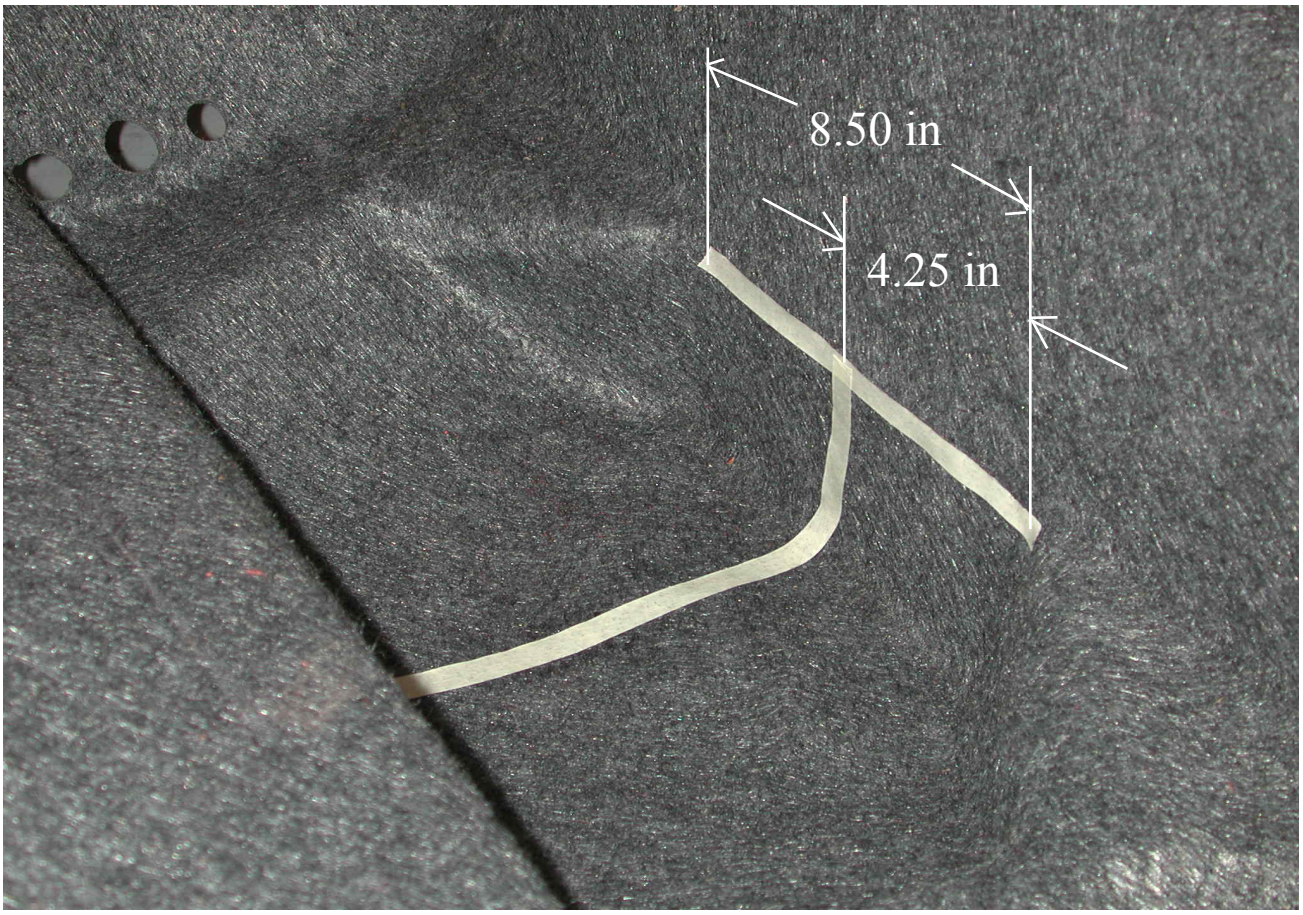


Figure: 4

Figure 4 shows the location of the rear horizontal slit. It is in-line with the two small platforms on each side as shown. The 8.50 in dimension is centered between the two platforms as shown by the 4.25 in dimension.

Dimensions Continued

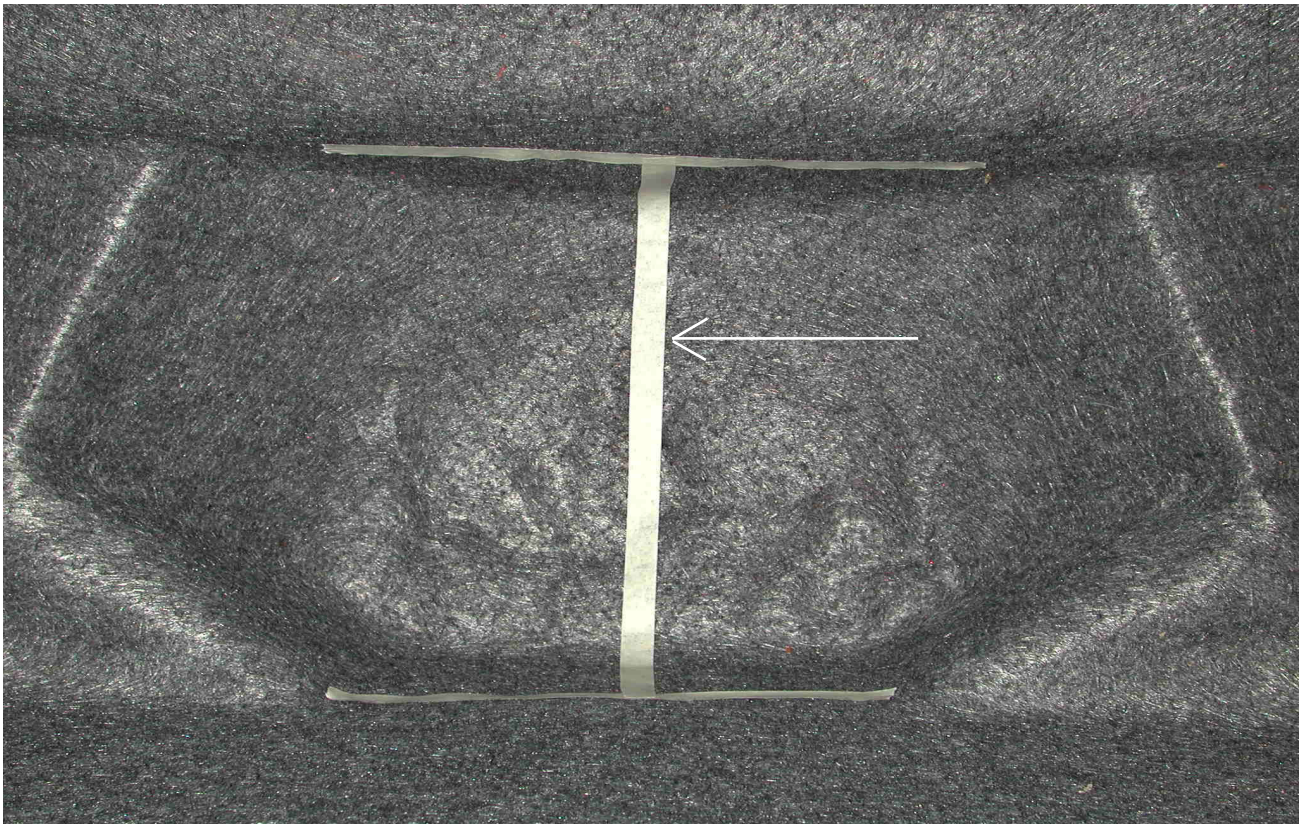
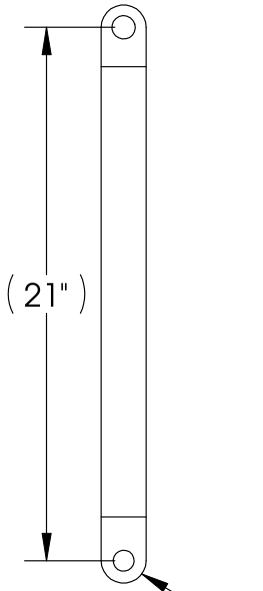


Figure: 5 Top View

Finally, cut the vertical slit connecting the two horizontal slits you just cut, as shown in figure 5. upon installing the carpet, tuck the flaps under & around the battery tray.

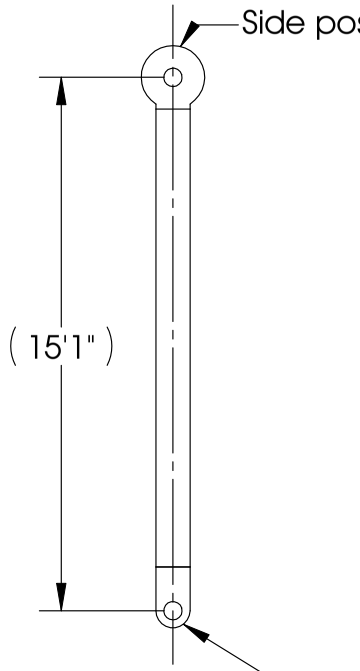
ZONE	REV.	REVISIONS DESCRIPTION	DATE	APPROVED

XX08685-0012
Chassis ground
Black in color
6 AWG wire



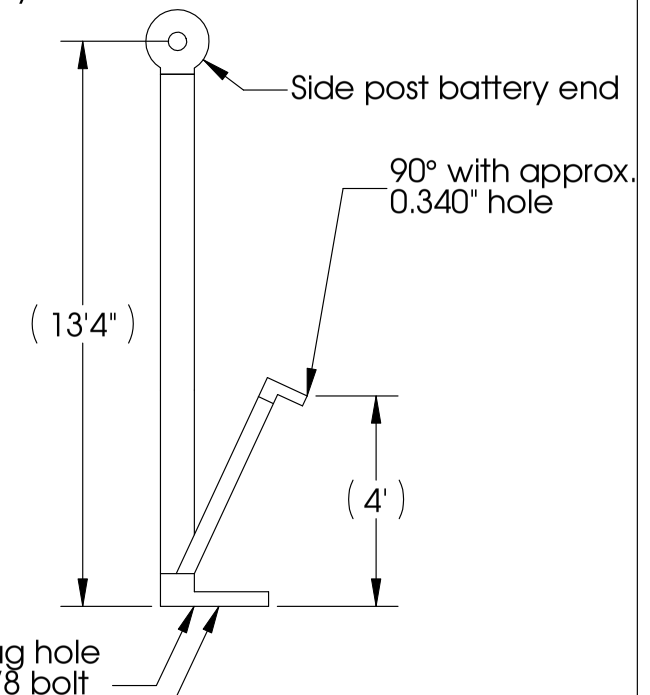
Straight lugs at both ends
Approximately 0.340" hole

XX08685-0011
Negative ground
Black in color
1/0 AWG wire



Straight lug
Approx. 0.420" hole

XX08685-0010
Postive cable
Red in color
Long wire is 1/0 AWG
Short wire is 6 AWG



90° lug hole
for 3/8 bolt

Both wires are connected
to the 90° lug hole terminal

PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF LINGENFELTER PERFORMANCE ENGINEERING. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF LINGENFELTER PERFORMANCE ENGINEERING IS PROHIBITED.

NEXT ASSY	USED ON
APPLICATION	

DIMENSIONS ARE IN INCHES
TOLERANCES:
0.XXX plus or minus 0.002

MATERIAL
- -

FINISH
- -

DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	BTW	8/4/04
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

COMMENTS:

Lingenfelter Performance Engineering

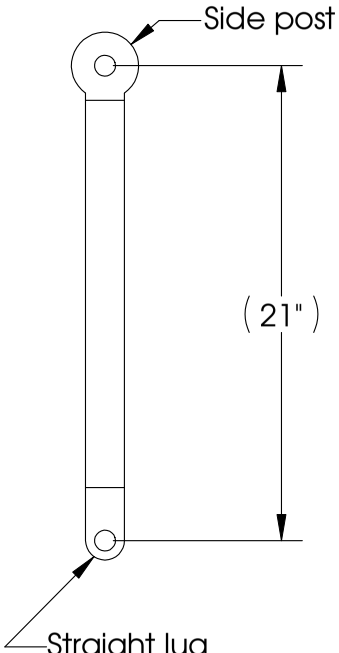
Standard Kit Battery Cable Specifications

SIZE	DWG. NO.	REV.
A		

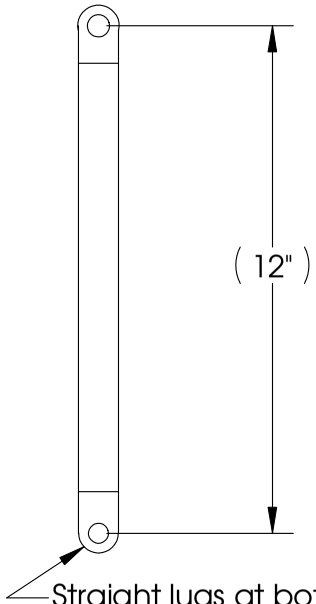
SCALE:1:4 | WEIGHT: | SHEET 1 OF 1

ZONE	REV.	REVISIONS DESCRIPTION	DATE	APPROVED

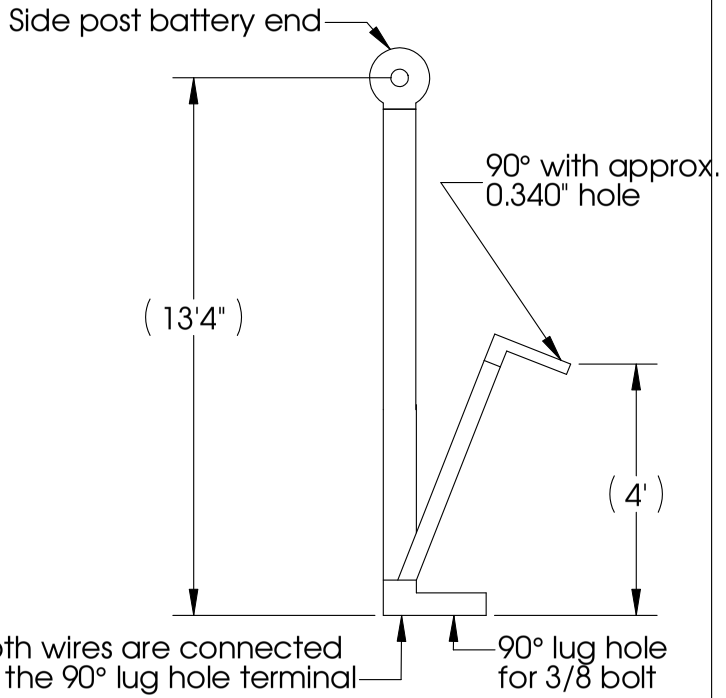
XX08685-0022
Battery ground to chassis
Black in color
1 AWG wire



XX08685-0021
Chassis to engine ground
Black in color
1 AWG wire



XX08685-0020
Postive cable
Red in color
Long wire is 1 AWG
Short wire is 6 AWG



PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF LINGENFELTER PERFORMANCE ENGINEERING. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF LINGENFELTER PERFORMANCE ENGINEERING IS PROHIBITED.

NEXT ASSY	USED ON
APPLICATION	

DIMENSIONS ARE IN INCHES
TOLERANCES:
0.XXX plus or minus 0.002

MATERIAL - -

FINISH - -

DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	BTW	7/29/04
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

COMMENTS:

Lingenfelter Performance Engineering

Light Weight Kit Battery Cable Specifications

SIZE	DWG. NO.	REV.
A		

SCALE:1.5:1	WEIGHT:	SHEET 1 OF 1