Supplemental Information & Instructions for
021-682 Heat Shield Kit, with Hardware
Austin Healey BN1, BN2

About this kit….

One of the distinctive features of the Big Healeys is the off-white asbestos heat shield panels attached to the foot box on the 100s, and the foot box and firewall of the 100-6 and 3000s, They were originally made from material containing asbestos, and aside from being a health hazard, they were fragile and prone to breaking, especially when being removed or installed.. The panels are also prone to deterioration, crumbling and simply falling apart.

Moss Motors has sold firewall heatshield kits from several different suppliers over the years. We have had problems with shipping damage, and we have also had a variety of complaints about the material, the shapes and design of the individual pieces. Many restorers would not buy the commercially available heatshield kits, preferring to make their own using their own patterns.

In 2008 we started gathering data on original panels, and we relied heavily on the collection of original samples collected by Eric Grunden (Absolutely British, Santa Maria, California) and Roger Moment. Eric has restored many Concours winning Healeys, and Roger is a recognized authority on the Healey 100. The kit we are offering for the BN1 and BN2 was developed primarily with input from Roger Moment. He made patterns based on the panels from his car, and refined the patterns based on hours spent examining other 100s. The patterns were revised several times before he turned them over to us.

We realize that the very early BN1s (body numbers B.21-5745) had only three heat shield panels. Beginning with B. 5746, they went to five panels, all of which had new part numbers. Finally, while the BN2 was in production, they split one of the five panels into two pieces without changing the part numbers-five panels listed, but six separate pieces fitted. Because it would be very impractical to produce all three versions of the heat shields, we decided to reproduce the last version, the 5-panel (6-piece) heat shield set. If you have an early BN1 with three panels, you may fit three of the panel from our kit.

Getting the patterns sorted was a major hurdle, but there remained two others- the material, and the surface finish. Talking to Roger and Eric, as well as other Healey enthusiasts, we quickly came to the conclusion that the soffit material from the James Hardie Company was the right raw material. It has the right thickness, and is has a smooth side, and a side with a distinctive "waffle pattern". It is a reasonably good insulator, and it is a very good approximation for the original material. It is asbestos free. It is not exactly the right color, but Roger provides excellent instructions for painting the panels. The remaining question is a potentially contentious one. With two sides, one smooth and one with a distinctive pattern, we had to decide which side faced out. Roger has made a very strong case for the 100s having heat shields with the smooth surface out and that is the way we have our panels cut. We know for a fact that some of you will be more than willing to debate this point, but we could not offer individual pieces cut both ways, which would be necessary to satisfy everyone with an opinion. I think it is safe to say that based on Roger's careful examination of cars with original heat shields, at least some of the 100s had all the heat shield panels installed smooth side out.

We are also including appropriate screws, lock washers, and most importantly, the larger, extra thick flat washers which secure the panels. We had to have the large flat washers made in England by a specialty hardware manufacturer because they were not available commercially.

The best heat shield kit is of no value if it arrives broken. We have taken extraordinary steps to have these panels (which are made here in the US) packaged to as to minimize the chance of shipping damage.

Reference Photographs

An original BN1 showing upper panel (1a) overlapping edge of side piece (1b).

Moss: Notice that the nuts (1c,1d) are visible. This means that the screws come through from inside the cockpit.

We obtained a set of original panels from Eric Grunden. The two panels on top of the footbox (1e, 1f) are both secured with 2 screws, flat washers, lock washers, and hex nuts.

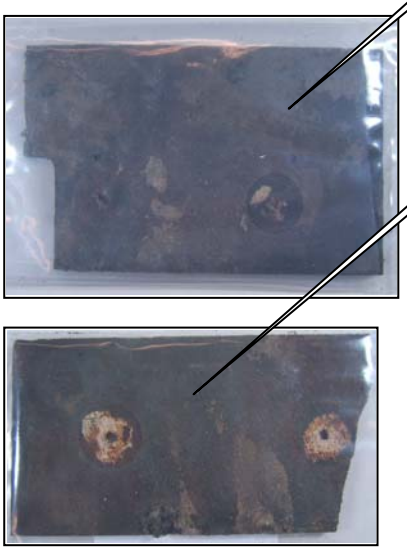


Fig 1

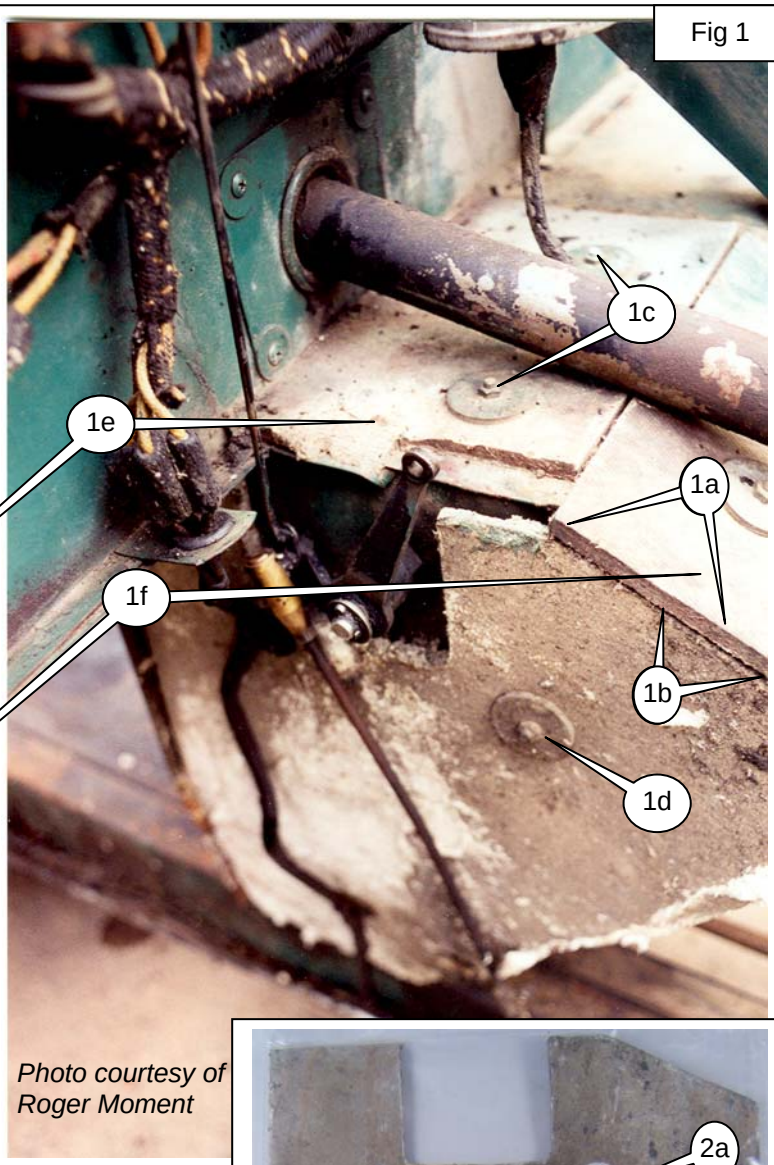
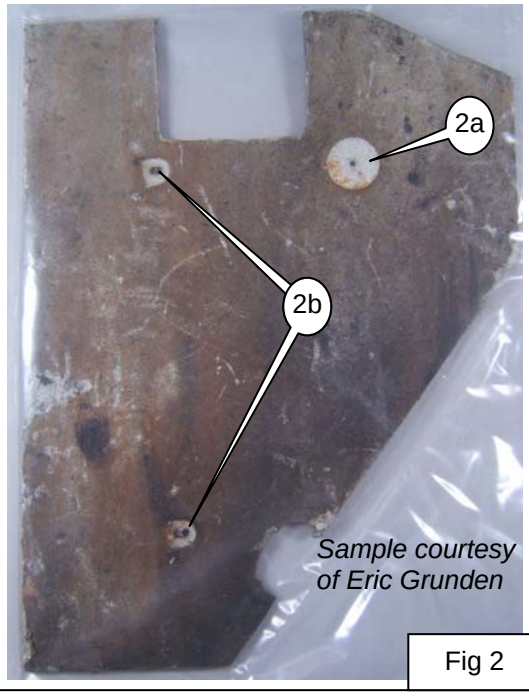


Photo courtesy of Roger Moment

The panel that covers the side of the footbox (Fig 2) has witness marks from the large flat washer (2a) and the two P-clips (2b) securing the wiring harness. The two P-clips normally sit on top of the large flat washers, so you would see something like 2a. It is unclear if the car left the factory this way, or if the P-clips had been removed and the washers lost at some point. The material under the P-clips is relatively white, so if the large flat washers were discarded at some point, it happened fairly early on in the life of the vehicle. The factory parts book calls for 14 each of the screws, flat washers, lock washers, and nuts, but that does not necessarily mean that all cars were built that way. This is a good example of the variation between vehicles that make it very hard to say with certainty what was or was not original.



Sample courtesy of Eric Grunden

Fig 2

An original, low-mileage BN2 showing bottom panel fit.

Fig 3

Photo Courtesy of Roger Moment

Moss: Fig 3 clearly shows the two-piece lower heat shield (3a, 3b) that covers the lower angled section of the footbox where the brake and clutch pedals are. The factory parts books we have show that there was a single part number (14B 3876) for the panel on this face of the footbox, but there are multiple examples of the split or two-piece panel on cars that still have the original panels in place. Roger has seen examples of one-piece panels too, but since the two-piece panels are just as authentic, and they make the installation easier, that is what we have reproduced. Making this panel in two pieces also allows installation of the shield on a finished car without having to remove the brake and clutch pedal assembly.

We also obtained a sample of the two-piece panel from Eric Grunden (Fig 4). The RH panel (4a) is missing a small piece (4c). Both the RH (4a) and the LH (4b) panels clearly show where the large flat washers were.

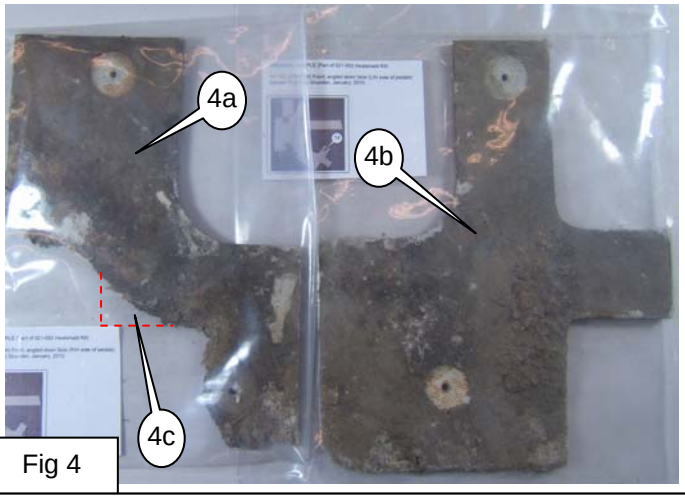


Fig 4

Samples Courtesy of Eric Grunden

Photo of an original, low-mileage BN2 showing panel fit on outer half of foot box.

Fig 5

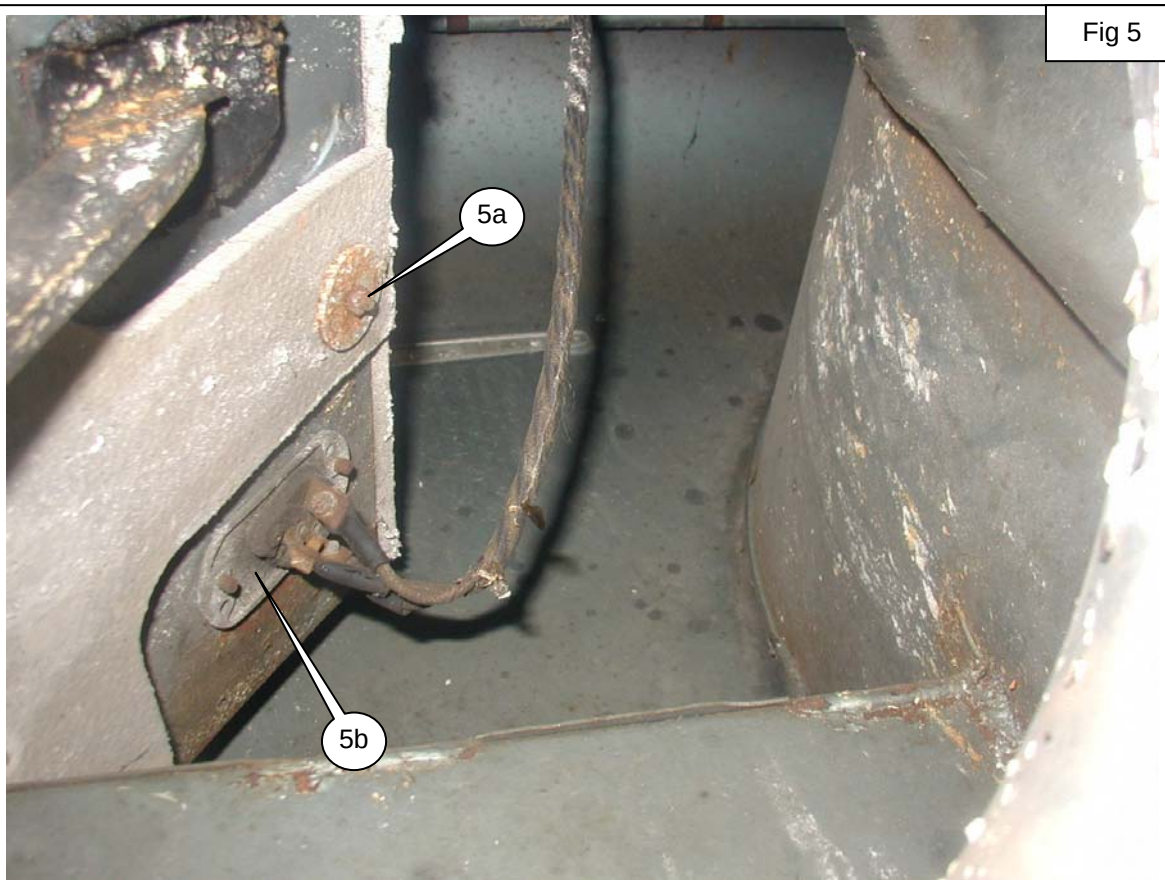


Photo Courtesy of Roger Moment

Moss: Fig 5 shows the LH piece of the two-piece panel. The upper LH corner of the panel is cut away to clear the dimmer switch (5b).

Contents of Kit

All of the pieces are attached to the L/H foot box.

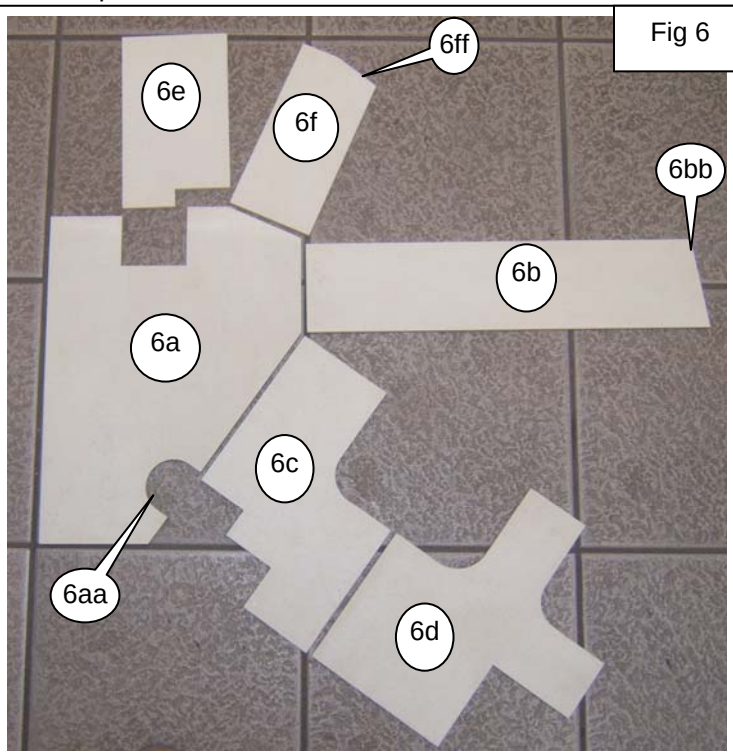


Fig 6

6a 14B 3877
Inner vertical face. *The relief for the throttle linkage (6aa) is larger than on some original panels for additional clearance.*
6b 14B 3875
Front vertical face.
Note angled edge (6bb)
6c 14B 3876 (R/H)
Front, angled down face
R/H side of pedals
6d 14B 3876 (L/H)
Front, angled down face
L/H side of pedals
6e 14B 3879
Top, horizontal face
6f 14B 3878
Front, angled up face.
Note angled edge (6ff)

The letters a, b, c, d, e, f also indicate the order in which the pieces will be fitted. The panels in this picture are "right side up", meaning the smooth surface (visible after installation) is uppermost

The location of the panels is shown in Fig 7.

For clarity, the location of the panels identified in Fig 6 are indicated using the same labels as use in Fig 6. For example, the location of panel 6a is called out in Fig 7 as "6a".

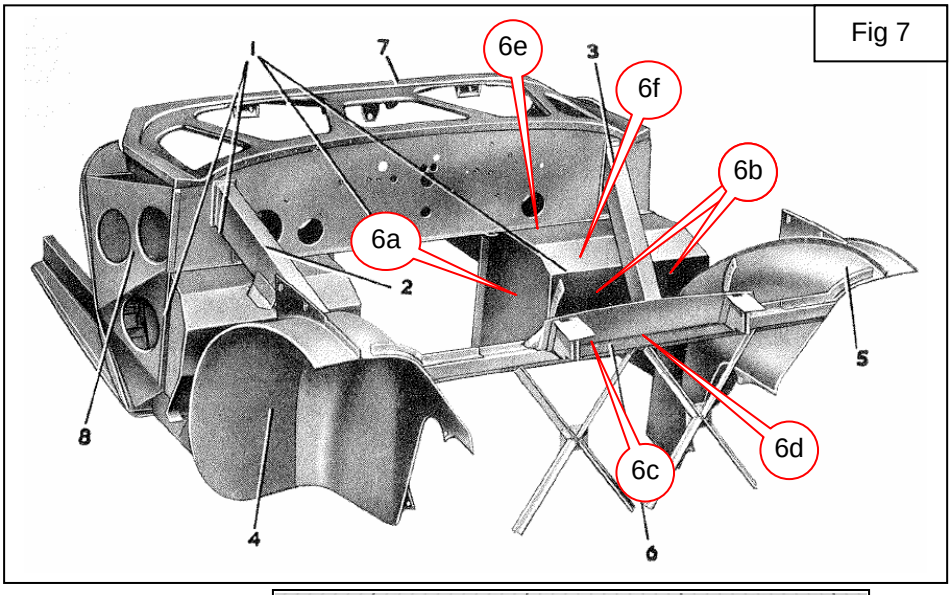
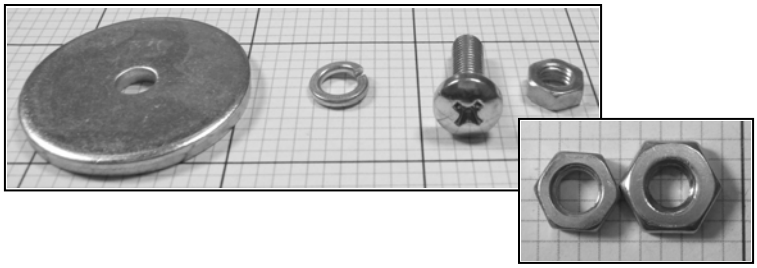


Fig 7

The kit also comes with 14 each of:
373-960 SCREW, 10-32 X 5/8, Pan Head
310-040 NUT, 10-32, 5/16" AF *
315-032 WASHER, Flat, #10 X 1.25 OD, Zinc
324-010 WASHER, Lock, #10
**The nuts included are identical in size to the FNZ103 hex nuts used to secure the panels when the car was built. Imported from England, they are 5/16" across the flats (AF). American 10-32 nuts are larger - 3/8" AF (see photos at right)..*



Instructions (by Roger Moment, Revised 14 April 2007)

Inspection of foot boxes on as-original BN1s and BN2s has shown some differences in heat shield mounting-hole placement, while the shield pieces themselves appear to be virtually identical. Therefore, to assure that holes for mounting new shield pieces will be properly located, the shield pieces are furnished with no holes drilled. You will need a duplicate set of paper patterns to use for locating hole positions on and then transferring to the heat shield pieces.

Heat shields can be installed on a car that is already built/complete, but it is significantly more difficult. The instructions will cover this situation as well as that where the chassis is stripped down with the engine removed.

You will need the following tools:

1) 3/8" carbide-tipped drill bit
2) Phillips screwdriver
3) Sockets and combination wrenches that fit the heat shield attachment nuts and others on the throttle linkage
4) Wrenches to fit both hex fittings (nipple and line nut) where the feed line to the brake master cylinder attaches to the bottom of the brake reservoir.
5) Long-nose pliers
6) A coarse half-round file

Preparation

If the car is being restored from the "ground up", before installing the shields you should attach the throttle pedal to the lower right corner of the sloped floor, and the pivot post for the throttle linkage bell crank at the top edge of the right side vertical footbox panel. You should also have all the throttle linkage hardware available for test-fitting. If the car is all together you will need to remove a number of items to gain access to the heat shield attachment screws. It will be necessary to position the car on jack stands so that you can work from the underside as well as top.

1) Remove both seats from the seat track (left side) and packing blocks (right side).
2) Remove the L/H trim kick panel
3) Remove the upper jute pad glued above the foot pedals to the top of the footbox
4) Remove the brake and clutch pads and metal pedal pieces
5) Remove the armrest pad, gear lever knob, and gearbox cover
6) Remove the front bulkhead panel just ahead of the gearbox cover
7) Pull up the carpet and underlayment pad from the L/H footbox, both sloping floor and R/H vertical panel. You should now have access to all 14 screws holding the heat shield pieces to the foot box. There is one additional screw attaching a P-clip for the line from the brake reservoir to the brake master cylinder. This is on the upper sloping shield, adjacent to the steering column (on LHD cars). Moss: See Fig 14, 14c
8) Remove the air cleaner from the rear carburetor.
9) Just behind the rear carburetor, remove the throttle linkage pivot post from the long, forward arm of the bell crank. Leave the pivot post ball attached to the brass fitting on the linkage rod. (Moss: See Fig 9c, 9d)
10) From the engine bay, remove the cotter pin, flat washer and 2-turn spring washer from the bell crank post and slide the crank off. (Moss: See Fig 9b) Leave the rest of the throttle linkage connections as they are.
11) From under the car, disconnect the clutch return spring from the bracket at the bell housing.
12) Also from under the car, disconnect the brake return spring (Moss: See 12c) and the brake push rod clevis pin (Moss: See 12d) and separate the push rod from the pedal. You may need to loosen the jam nut on the brake pushrod and change the adjusted length to give yourself some slack.
13) Remove the nut securing the P-clip that holds the feed line going from the brake reservoir to the master cylinder. (Moss: See Fig 14c.)

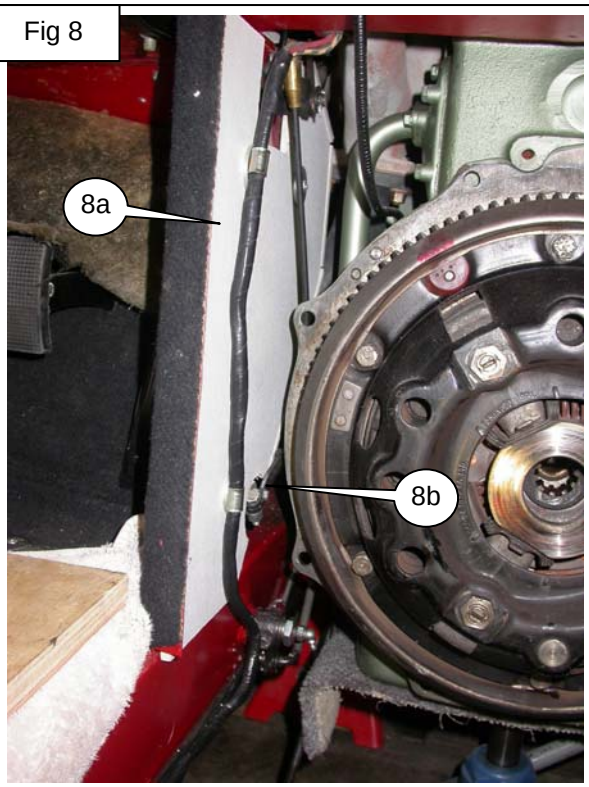
Preparation, continued

14) Siphon all brake fluid out of the reservoir. *Moss: if not silicone, flush any spills immediately with water to minimize damage to paint. Do not rub with a rag.*
15) Place a number of paper towels or rags under the brake reservoir to absorb any fluid drips and disconnect the brake line. You will need to use a second wrench to hold the hex fitting just above and on the underside of the reservoir.
16) Once the feed line nut is fairly loose, remove the screw and nut holding the clamp around the brake reservoir.
17) Finish removing the feed line, slightly spread the clamp band, and remove the brake reservoir. Be sure to immediately wipe up and wash off any spilled brake fluid, as it will attack the paint (Note: if the system contains silicone brake fluid, this will not attack paint).
18) Lift the line and P-clip free of the screw, and then remove the second nut and small flat washer.

Note: The original heat shields are made from a pressed asbestos board. Wear a face mask when removing these and cleaning the underlying sheet metal. Wrap all asbestos pieces in plastic and take to a location where hazardous materials can be disposed.

19) Remove all nuts and screws attaching the heat shields to the foot box. *Moss: You may find that some (or all) of the nuts securing the heat shield panels in your car take a 3/8" wrench. If so, the original FNZ103 nuts (which take a 5/16" wrench) were replaced with American nuts. We are including 10-32 hex nuts in the kit that match the original nuts. You may also find that you are missing one or more of the original large flat washers (53K3121). These washers have been unavailable for many years. Using samples provided by Eric Grunden (Absolutely British, Santa Maria, CA), we have had them reproduced in the UK by a specialty hardware manufacturer. Although we are supplying fasteners for the heat shields, you will need to reuse some of the P-clips and related hardware you will remove.*
20) The large vertical panel on the right side of the footbox (8a) will require some juggling to thread out and back into the cockpit. You may need to adjust the throttle pedal position so the arm (8b) clears the bottom edge of this panel.
21) Using a wet sponge, clean off any residual shield material from the sheet metal. You may need to also use a wet Scotchbrite pad.

Fig 8



22) Clean up all mounting screws and washers. You may refurbish them and reuse them if they are in good condition, but new hardware is included in the kit.
23) Lay out the panels on suitably sized pieces of stiff paper as shown in Fig 6. Note that there are angled edges (6bb, 6ff) on two of the panels. They must be as shown in Fig 6. Carefully trace each one of the new panels on the paper. Remove the panels and write the word OUT in the middle of each traced shape so you will know how to position the pattern on the footbox sheetmetal. Cut out the paper patterns. *You will be using these to locate the holes in the sheetmetal so you can accurately drill the holes for the mounting screws in the new heat shield panels, so take you time and make your patterns as accurately as possible. Individual replacement panels are not available.*

Heat Shield Installation

Note: On 100s all mounting screws are inserted from the cockpit side, with the washers and nuts visible in the engine compartment. The instructions below describe how to install the heat shields if the car is not apart. With a new restoration the shields should be one of the first items attached to the bare frame and the job will be much easier. However, the throttle linkage will need to be temporarily connected so the clearances in Step 5 can be assessed and adjusted.

1)Using a paper pattern for the vertical triangular panel, mark the location of the three mounting screws. Position the pattern so that it lines up with the top and front angled edges of the footbox. The back edge should be against the flange at the cockpit. The round cutout should be centered around the throttle pedal shaft.

*2)*Transfer the hole locations to this heat shield panel and drill 3/8" holes using the carbide-tipped drill bit. Moss: place a piece of wood on a flat surface and lay the panel on top; drill through the panel and into the wood. The wood will prevent the drill but from "blowing out" chunks of the panel. Slightly oversized holes will allow room for final positioning adjustment. Test-fit the panel against the footbox and verify, using screws, that the holes line up properly and the edges are flush with those of the footbox. **Note: if the sheet metal is significantly bulged, the shield will not lay flat against it. In this case you will need to flatten the panel so that the gap to the shield around the edges is 1/8" or less.** ***[Moss: If you attempt to attach the panel to sheetmetal that is not flat, the heatshield panel will break.]***

3) Mount the panel temporarily.

4)Note that there are two wiring harness P-clips (9a) that attach to the top and bottom rear screws.

5)Fit the upper bell crank (9b). Fit lower arm (10a) on the throttle pedal shaft. Verify that the bell crank arm (9b) and the ball stud at the end of the linkage rod (9c) do not contact the panel. Check the clearance between the linkage rod (9d) and the panel. Verify that the bottom arm (10a) and the pinch bolt (10b) that secures the bottom arm to the throttle pedal shaft do not touch the panel. The heat shield shape can be easily modified a bit, if necessary, using a coarse file or sharp knife. The bell crank and lower throttle arms may be bent away from the panel to improve clearances if necessary. When satisfied, remove the bell crank (9b) for now, as the throttle linkage running forward will interfere with inserting the top heat shield pieces.

WARNING! The throttle linkage must move freely through its FULL range of travel!! If not, the engine may not reduce speed when you take your foot off the pedal, with potentially dangerous consequences. If the arm (10a) is prevented from moving by contact with the shield, the throttle pedal shaft can rotate *even though* the pinch bolt (10b) is tight. If that happens, the throttle linkage adjustment will be altered and the range of throttle operation will be affected.

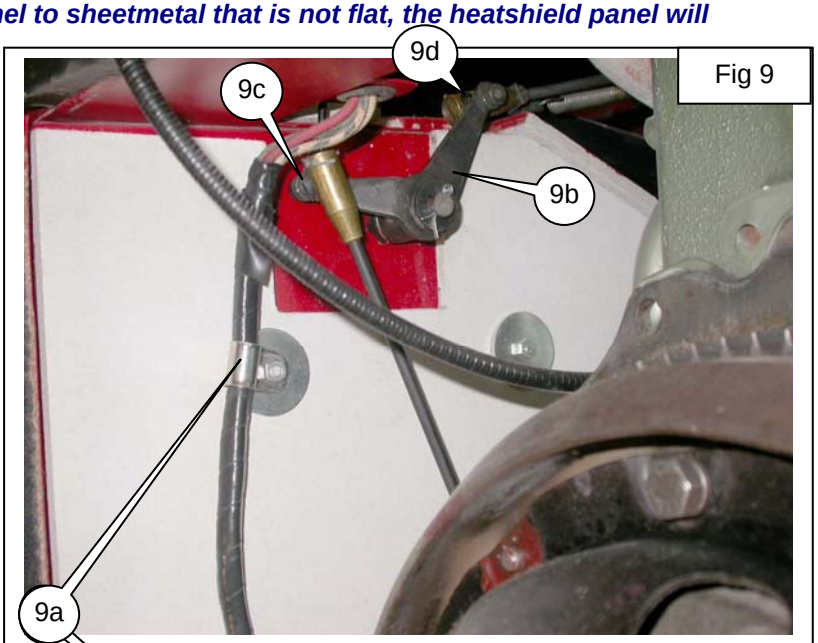


Fig 9

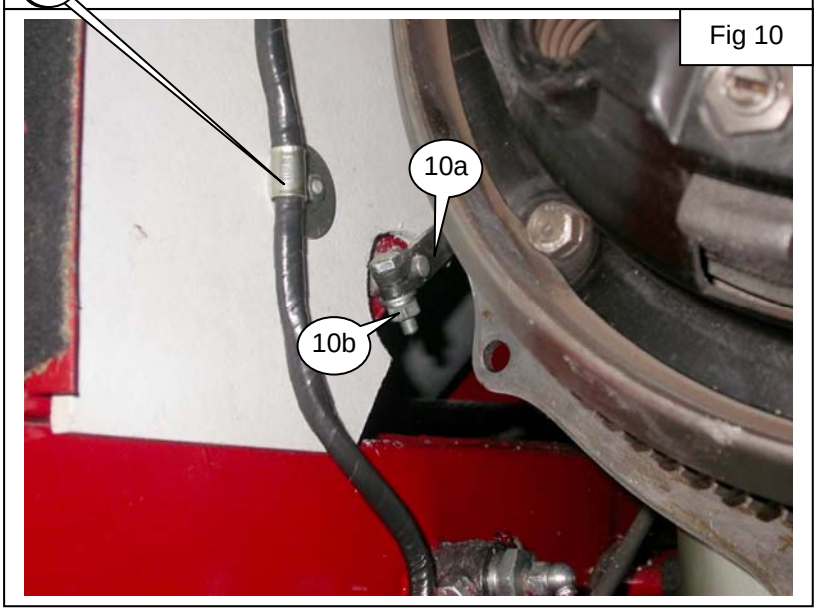


Fig 10

Moss: To facilitate the identification of the individual panels referred to in the instructions, Fig 6 is repeated here.

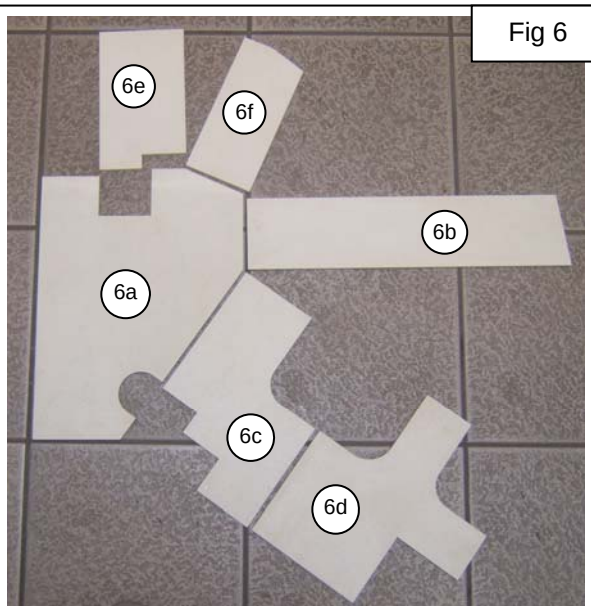


Fig 6

Note: With the exception of 6d, all the other panels (6b, 6c, 6e, 6f) overlap the edges of the first piece installed (6a). The edges where these pieces overlap should be flush with the first (vertical) panel's exposed surface. (See Fig 1 & 9) Keep this in mind when positioning the paper patterns to locate mounting screw holes.

Once each panel piece has been fitted and removed, give it a very light coat of Rustoleum white clean metal primer. That is nearly an exact match for the color of the original panels. However, the primer is flat and thus holds dirt and oil - you can't clean it up. To protect the primer and give you a surface you can keep clean, coat the primed panels with Minwax spray satin clear urethane. With a light coat this provides a surface that can be kept clean fairly easily, and it is barely visible. If you lay on too much urethane, the panels will be shiny, which is not what you want.

6) Repeat steps 1-3 above to mount panel 6b against the front vertical face of the footbox (11a).

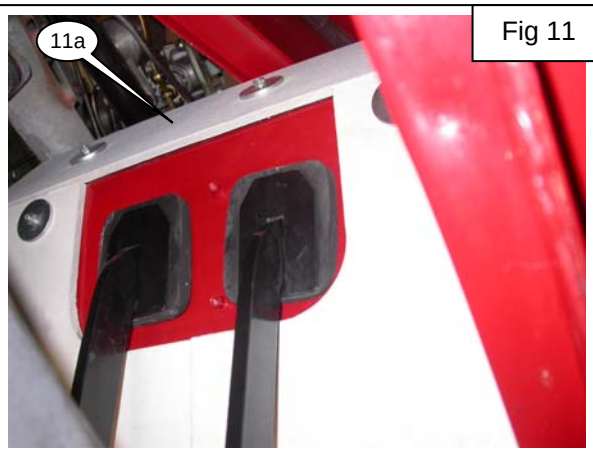


Fig 11

7) Repeat steps 1-3 to mount panels 6c and 6d to the footbox around the pedals (12a, 12b). You will need to depress the clutch pedal fully to provide working room for inserting the outboard panel (6d, 12b).

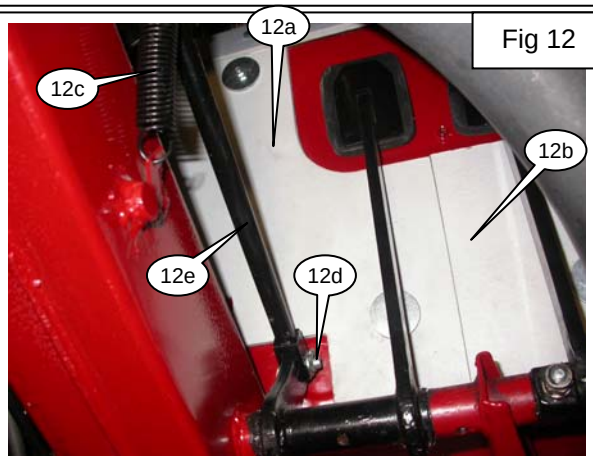


Fig 12

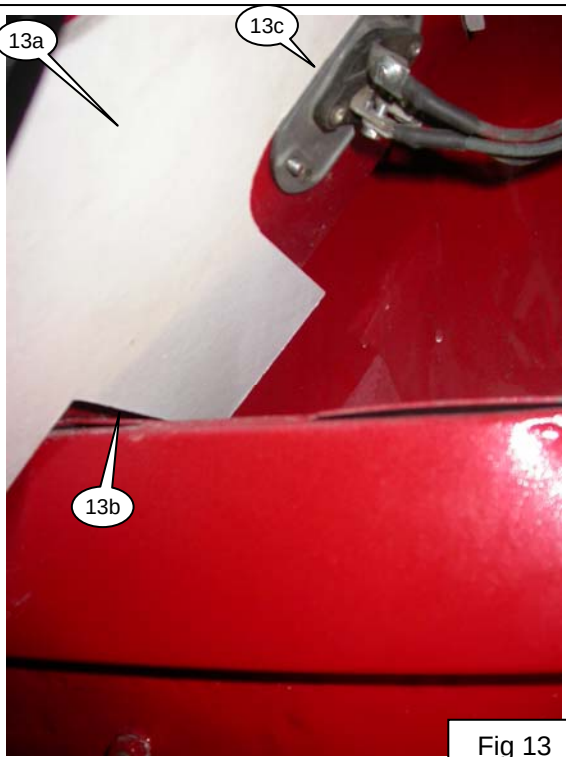


Fig 13

The outer panel (13a) will just clear the frame (13b) and the dimmer switch (13c)

Moss: Fig 14 & 15 show the finished installation, and they are being used to help clarify the written instructions. The work in process will not look like the photos until you are completely done.

On many original BN1s, and some BN2s, the top two small panels were found to have been hand brushed body color, along with their associated mounting hardware. This is why these two panels don't appear white in the accompanying photographs.

8) Repeat steps 1-3 to mount panel 6e. (14a)

9) Repeat steps 1-3 to mount panel 6f. Panel 6f is most easily inserted from below by sliding it across the top front edge of the footbox. (14b)

10) From inside the cockpit, mark the position of the 10-32 screw that attaches the brake line P-clip (14c) on the back of the heat shield panel 6f.

11) Remove the panel 6f and drill a hole for the screw that secures the P-clip using a 13/64" or 7/32" twist drill.

12) Re-position the panel 6f and drop a screw through the hole for the P-clip. This is temporary; this will keep the hole in the panel 6f and the hole in the sheetmetal lined up while attaching the heat shield panel with the other two screws, lock washers, large flat washers and nuts.

13) From inside the cockpit, push the P-clip screw up through the hole in the sheetmetal and through the heat shield panel. While you hold the screw in place, have an assistant place a #10 flat washer on the screw. Start the 1st nut and run it down. *Do not attach the P-clip at this time.*

14) Verify that the panels 6e and 6f do not interfere with the throttle linkage.

15) Complete the installation of the bell crank (15a) using the 2-turn spring washer, flat washer, cotter pin and pivot posts (still attached to their brass linkage fittings) that were removed earlier.

16) Re-connect the clutch pedal spring and re-install all interior trim in the reverse order that it was removed.

17) Reconnect the line from the brake master cylinder to the brake reservoir and clamp the reservoir in its mounting bracket.

18) Reconnect the brake pushrod (Moss Ref 12e) and replace the clevis pin, washer and a new cotter pin (12d).

Fig 14

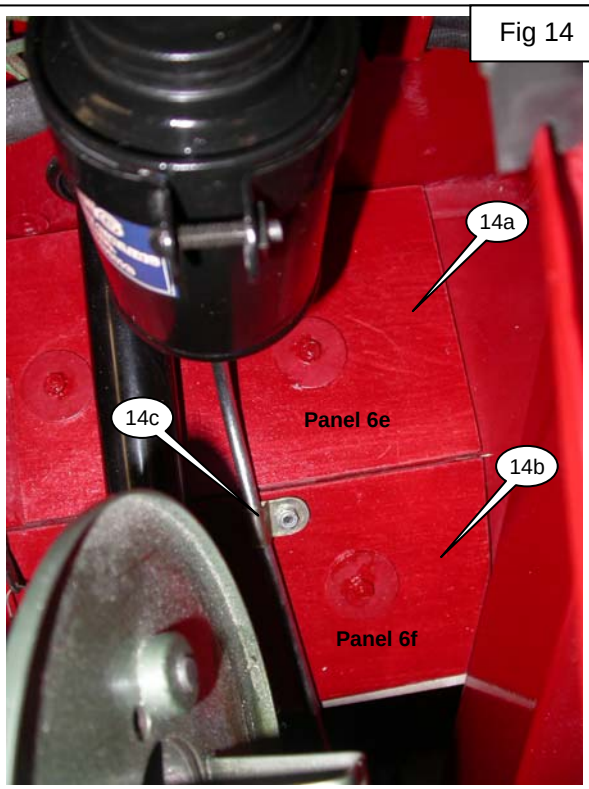
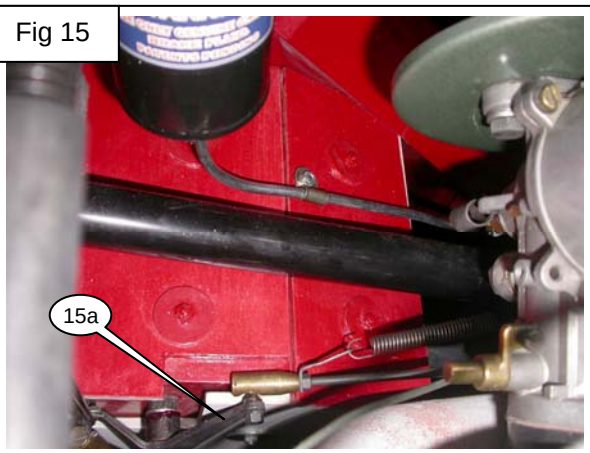


Fig 15



19) Readjust the brake pedal free play (refer to your workshop manual for the procedure). Reconnect the brake return spring (12c)
20) Fill the reservoir and bleed the brake system.

21) Position the brake line P-clip (14c) and attach using the original 10-32 nut.

Moss Motors could not have created this heat shield kit without the assistance of Roger Moment and Eric Grunden. We are deeply indebted for their time, knowledge, and patience.

Notes

*Although every effort has been made to ensure the accuracy and clarity of this information, errors and/or omissions on our part are almost inevitable. Any suggestions that you may have that will improve the information (especially detailed installation notes) are welcome. Please use the simple email form on the **"Contact Us"** page on the Moss website: http://www.mossmotors.com/AboutMoss/ContactUs.aspx*
If you prefer, you may call our Technical Services Department at 805-681-3411. So many people call us for help that we are often not able to answer the calls as fast as we'd like, and you may be asked to leave a message. We apologize in advance for the inconvenience. We will get back to you within 2 business days.

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