TRUCK GENERAL MAINTENANCE, LIGHT, WINCH, MC2 – LANDROVER 110 6X6

REPLACEMENT OF THE BATTERY CHARGER

MODIFICATION INSTRUCTION

This instruction is authorised for use by command of the Chief of Army. It provides direction, mandatory controls and procedures for the operation, maintenance and support of equipment. Personnel are to carry out any action required by this instruction in accordance with EMEI General A 001.

INTRODUCTION

1. This instruction details the replacement of the General Maintenance Vehicle (GMV) module battery charger unit with an LEA designed power supply battery charger assembly designed specifically for the GMV. The original Arlec brand battery charger is no longer available and is to be replaced with the new 12/24 V battery charger when the old unit requires replacement. The replacement of the battery charger also requires the existing 240 V transformer to be relocated as part of this modification instruction.

2. Associated Publications. Reference may be necessary to the latest issue of the following documents:

a. Current version of the Technical Regulation of ADF Materiel Manual – Land (TRAMM-L) (available from DTR-A website http://intranet.defence.gov.au/armyweb/Sites/DTRA);

b. Electronic Supply Chain Manual (ESCM), Volume 4, Section 3 – Supply Management Processes, Stores Accounting General, ESCM website http://escmv4web/8210.htm; and

c. ESCM, Volume 6 – Manage Repairable Items, http://escmv4web/2071.htm.

3. Authority. A Land Rover Australia Engineering Change Notice authorises the change in battery charger supply. CGSVSPO ECO 26/10 is the authority to carry out this modification.

GENERAL

4. Modification Application. This modification is to be applied to all stocks of Land Rover 110 General Maintenance Vehicles modules upon failure of the existing battery charger. This modification does not apply to modules built in MY08 that were manufactured for but not with the new 12/24 V battery charger. These modules may be fitted to any vehicle ARN and can be identified by the serial number plate fitted to the module located in the rear lower foot well. The serial numbers of those modules are A3101 to A3110.

5. Items Affected. This modification alters the battery charger and the transformer.

NOTE

Where modification would delay priority issues of depot or pool stock, equipment may be issued unmodified providing the equipment record book is endorsed appropriately.

6. Priority – Group 2. All applicable equipment is to be modified upon failure of the battery charger assembly.

7. Action Required. Actions detailed in this instruction are to be performed by technical maintenance organisations authorised to carry out Light, Medium or Heavy Grade Repairs by ECN 418 or civilian equivalent.

NOTE

On receipt of this instruction, enter all relevant information other than date completed in the modifications section of the GM 120 – Record Book for Service Equipment.

8. Task Recording. The conduct of this modification is to be recorded in an SDSS Work Order using MMM standard job number 8138.

9. Estimated Work Hours. For initial planning purposes only, it is estimated that this modification will take 3 work hours to perform.

10. Stores Required. The stores required are listed in Table 1. All stores are to be demanded through normal supply channels.

Table 1 Stores Required

Item	NSN	Mfr Part No	Designation or Description	Unit of Issue	Qty Per Kit	Qty Per Equip
1	6130-66-158-4600	CYG9184	Battery charger 240 V	EA		1
2	5340-66-158-4599	JYG0854	Bracket battery charger mounting	EA		1
3		AS/NZS 3679.1	Steel angle 40mm x 40mm x 3mm	Mt		1.26
4	5310-66-128-5543	MM106301	Rivnut, M6	EA		3
5	5975-66-014-1320	AS 2053 SECTION 5	20mm electrical conduit	MR		1
6		Clipsal 242/20	20mm PVC conduit joiner	EA		1
7		Blackwoods 03289864	Cable, auto, 6.0 mm x 30 m, red	RL		1.5
8		Blackwoods 03289767	Cable, auto, 6.0 mm x 30 m, black	mt		1.5
9		Narva 5816-30WE	Cable, auto, 6.0 mm x 30 m, white	mt		1.5
10		Blackwoods 00589237	Screw pan head - M5 x 10mm Zinc plated	EA		3
11		Narva 56585	Nylon cable clamp, ‘P’ clip, 12.7 mm, pack of 100	PK		1
12		Narva 56582	Nylon cable clamp, ‘P’ clip, 6.4 mm pack of 100	PK		2
13		Blackwoods 05251154	Ring terminal, uninsulated, 8 mm, Cabac RTC5.5-8	EA		6
14	5305-99-122-6643	SE106161	Screw, pan head, X recess, M6 x 16 mm	EA		14
15	5310-66-144-6472	008562-BE06000M	Nut, selflocking, hex, M6, zinc plated, black	EA		4
16	5310-99-208-6458	WL106001	Washer, spring, M6	EA		10
17	5310-99-122-6474	WA106041	Washer, plain, M6	EA		14
18		Blackwoods 02938865	Heat shrink, thin wall, XLP 5.0 mm x 4 ft, red	EA		Qty
19		Blackwoods 02940162	Heat shrink, thin wall, XLP 5.0 mm x 4 ft, white	EA		Qty
20		Blackwoods 02929951	Heat shrink, thin wall, XLP 5.0 mm x 4 ft, black	EA		Qty
21		Blackwoods 02936559	Heat shrink, thin wall, XLP 20.0 mm x 4 ft, black	EA		Qty
22		Blackwoods 01788558	16 mm flex cable gland	1		1

11. Items to be Removed. The items to be removed are listed in Table 2. All stores removed are to be processed in accordance with ESCM, Volume 4, Section 3 – Supply Management Processes, Stores Accounting General.

Table 2 Items to be Removed

Item	NSN	Mfr Part No	Designation or Description	Qty Per Equip
1	6130-66-128-6073	PS924	Battery charger,240 V AC 50Hz, Arlec	1
2		HYM366	Bracket, transformer mounting	1
3		HYM365	Bolt, 'J', ¼ in dia by 120mm lg	2
4		HYM58	Clamp, battery charger support	1
5		HYM57	Bolt, 'J', ¼ in dia by 180 mm lg	2
6	5130-99-122-6474	WA106001L	Washer, flat, 6 mm bolt size, 12.5 mm OD by 1.60 mm thk	4
7	5130-99-730-9625	AFU1272	Nut, wing	4

12. Special Equipment Required. The following tools are required to complete this modification:

a. a 22 mm hole saw, and

b. a rivnut installation tool to suit M6 rivnuts,.

NOTE

If required, a suitable rivnut tool may be requested through normal supply channels using NSN 5340-66-155-3717.

DETAIL

Repalcement of the Battery Charger

13. Removal of Battery Charger Wiring. Remove the battery charger wiring as follows:

a. Disconnect the battery negative terminal and ensure the vehicle is not connected to an AC power supply.

b. Remove the selector knobs from the switchboard (Figure 1).

Figure 1 Switchboard Panel Cover

c. Remove the switchboard panel cover by inserting a flat blade screwdriver into the slots (Figure 1) and detaching the front cover.

d. Locate the 24 V DC circuit breaker and disconnect the red wire. (Figure 2)

Figure 2 Battery Charger Wiring at Switchboard

e. Locate the black wire from the battery charger and disconnect it (Figure 2).

f. Remove the disconnected wires from the conduit and discard them.

g. Refit the switchboard cover and selector knobs.

14. Removal of the Battery Charger and Transformer. Remove the battery charger and transformer as follows (Figure 3):

Figure 3 Original Battery Charger and Transformer

a. Unplug the battery charger (Table 2, Item 1).

b. Disconnect the battery charger positive (red) and negative (black) cable from the charger battery outlet terminals.

c. Remove and discard the cables.

d. Undo the wing nuts, (Table 2, Item 7) and remove the battery charger (Table 2, Item 1) with the support clamp, 'J' bolts and washers (Table 2, Item 6).

e. Undo the transformer cover and disconnect the wiring from the input and output terminals.

NOTE

Mark the wiring to ensure that the correct polarity is maintained during reassembly of the transformer.

f. Remove the 20 mm corrugated conduit from the transformer.

g. Refit the transformer top cover as the transformer assembly is retained.

15. Removal of the Mounting Brackets. Remove the mounting brackets as follows:

a. Using an angle grinder, remove the two welded brackets that the battery charger and transformer mount on from the underside of the bench.

NOTE

Do not take too much parent material from the bench underside. The brackets are no longer required and can be ground away to remove the welds.

b. Ensure the surface is smooth and free from burrs. Patch paint the area with cold gal paint.

16. Manufacturing of the Transformer Mounting Brackets. Manufacture the transformer mounting brackets as follows:

a. Cut two lengths of mild steel angle 40 x 40 x 2.5 or 3 mm 630 mm long. Clean up the ends to remove any burrs.

b. Drill the holes in both brackets as indicated in Figure 4. Remove any burrs.

NOTE

Not all transformer mounts are at the same distance apart. The dimensions noted in figure 2 are a guide and the actual distance for the transformer mounts holes may vary by up to 5 mm.

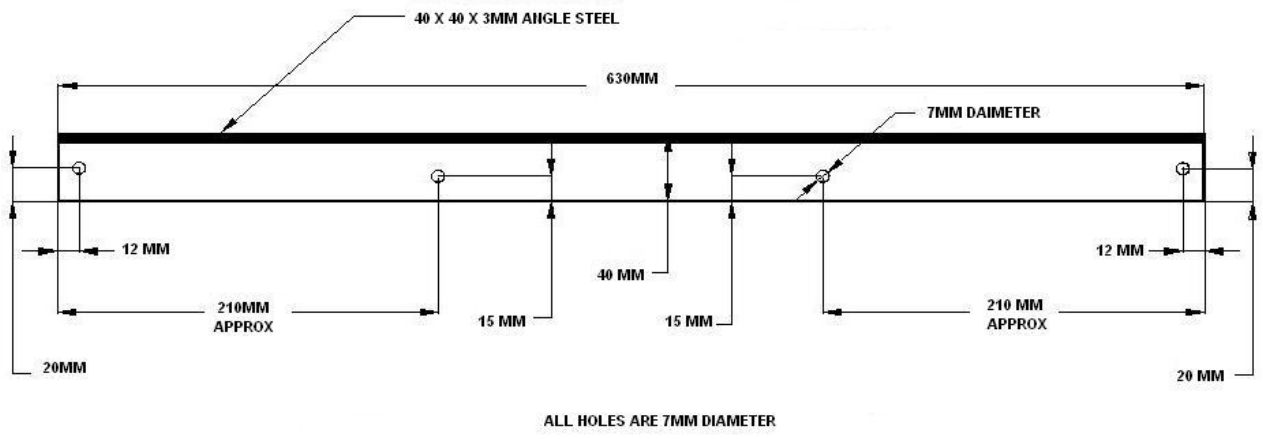

Figure 4 Transformer Mounting Bracket

c. Paint the brackets with olive drab paint and allow the paint to dry.

17. Relocation of Transformer. Relocate the transformer as follows:

a. Place the transformer in between the brackets and align the centre holes on the bracket with the transformer mounting holes.

NOTE

The transformer mounting holes may be smaller than 6 mm and will need to be enlarged by drilling out to accept a 6 mm bolt.

b. Secure the transformer with the 6 mm x 15 mm bolts, flat washers and Nyloc nuts (Figure 5).

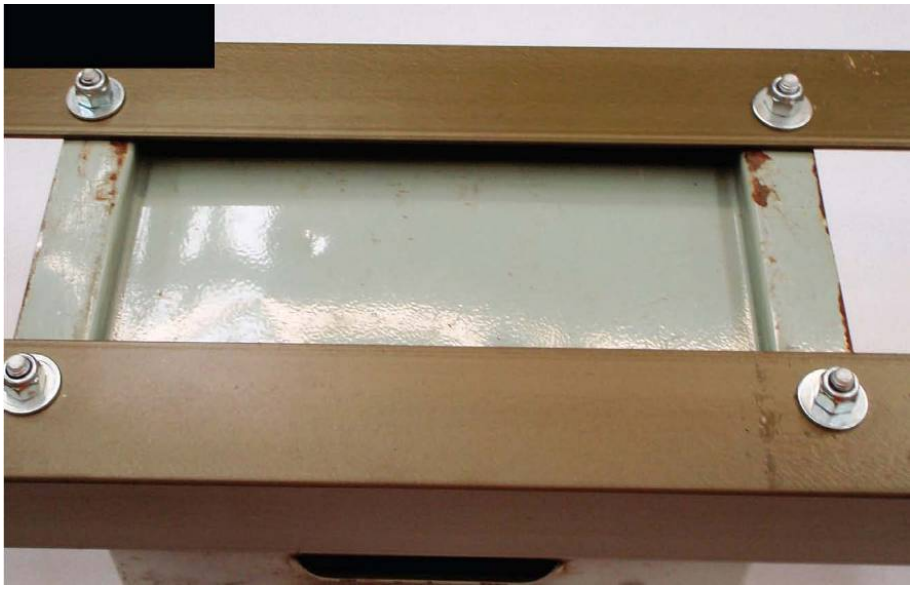

Figure 5 Transformer Mounting Nuts Secured

c. On the bench rear support upright, measure the distance from the lower mounting screw to the bench top and note the measurement. (Figure 6)

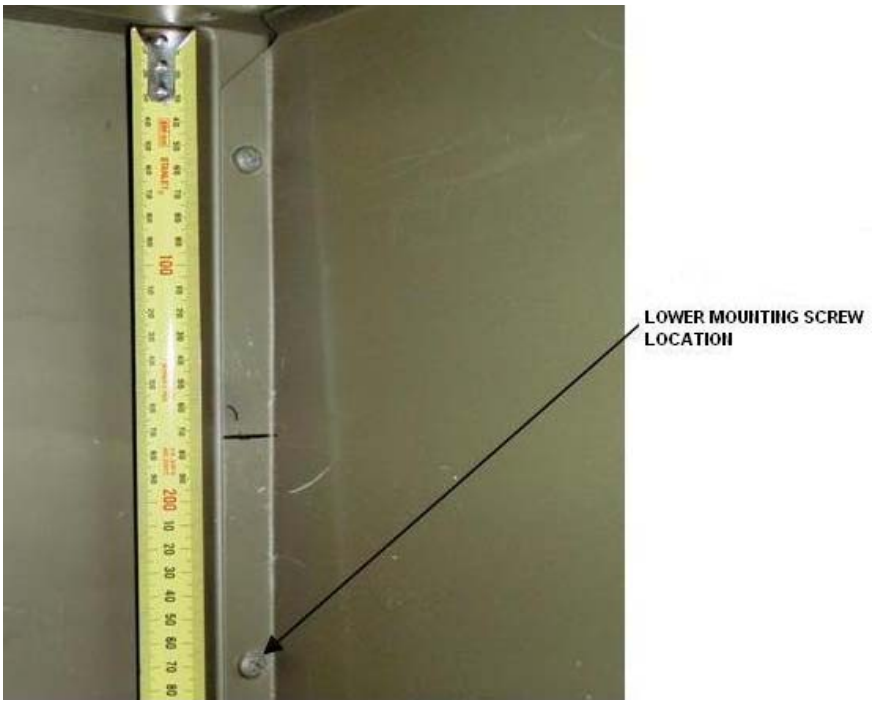

Figure 6 Measuring Lower Mounting Screw

NOTE

There will be slight variation from vehicle to vehicle. The measurement taken should be approx 270 mm.

d. On the front upright support, measure the same distance as measured in Para c from the top and mark the upright. (Figure 7)

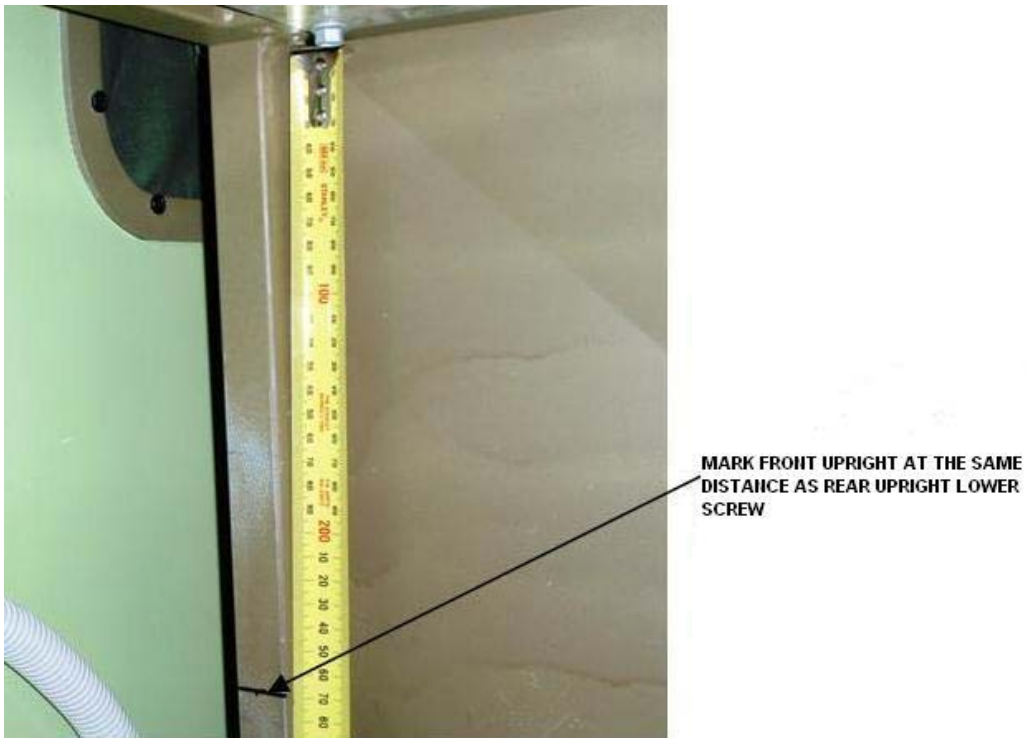

Figure 7 Marking Front Upright Support Post

e. Remove the 6 mm lower mounting screw (Figure 6).

f. Ensuring that the wiring outlet holes face the front of the module, fix the transformer and bracket in place using the removed screw to secure it (figure 8).

NOTE

The use of a support to assist in holding the transformer in position while marking may be necessary.

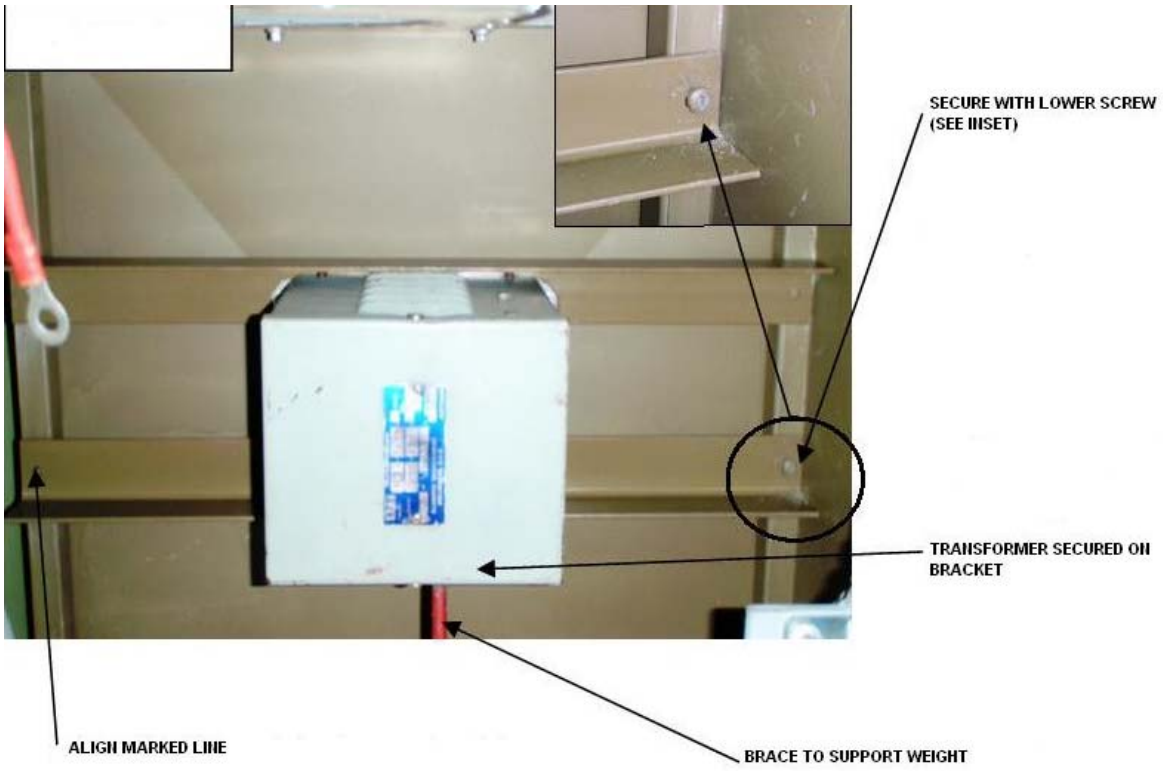

Figure 8 Transformer in Position

g. Align the lower bracket hole to the line marked in Para d (Figure 8).

h. Using the transformer and bracket as a guide, mark the position of the other three holes and remove the transformer and bracket assembly.

i. Centre punch the position of the holes and drill three 9 mm holes.

CAUTION

Care needs to be taken to remove the side panel without bending or creasing it otherwise it will be very difficult to refit and align the six mounting screws.

j. Remove the right-hand side panel by undoing the six screws that mount it to the frame and sliding the panel forward to allow for access to the rear upright mount post where the 9 mm hole was drilled.

k. Fit three 6 mm rivnut (Table 1, Item 5), using a suitable nutsert tool.

l. Refit the side panel so it is on top of the newly fitted rivnut and align the screw and tighten it.

m. Fit the transformer and bracket, ensuring the wring outlet holes are facing the front of the vehicle. Secure it using four 6 mm bolts, spring and flat washers (Table 1, Items 15, 16 and 17).

18. Connecting the Transformer. Connect the transformer as follows:

a. Remove the transformer top cover.

b. Fit the two lengths of 20 mm corrugated conduit, (input and output) to the transformer.

NOTE

The old battery charger output wiring conduit may have had a ‘T’ piece fitted. This will need to be removed and a 20 mm PVC conduit joiner and approx 350 mm of 20 mm conduit will need to be fitted. This may depend upon the existing vehicle output conduit configuration.

c. Reconnect the 240 V input to transformer.

d. Reconnect the 24 V DC to the transformer output.

e. Refit the transformer top cover.

f. Secure the conduit with cable ties (Figure 9)

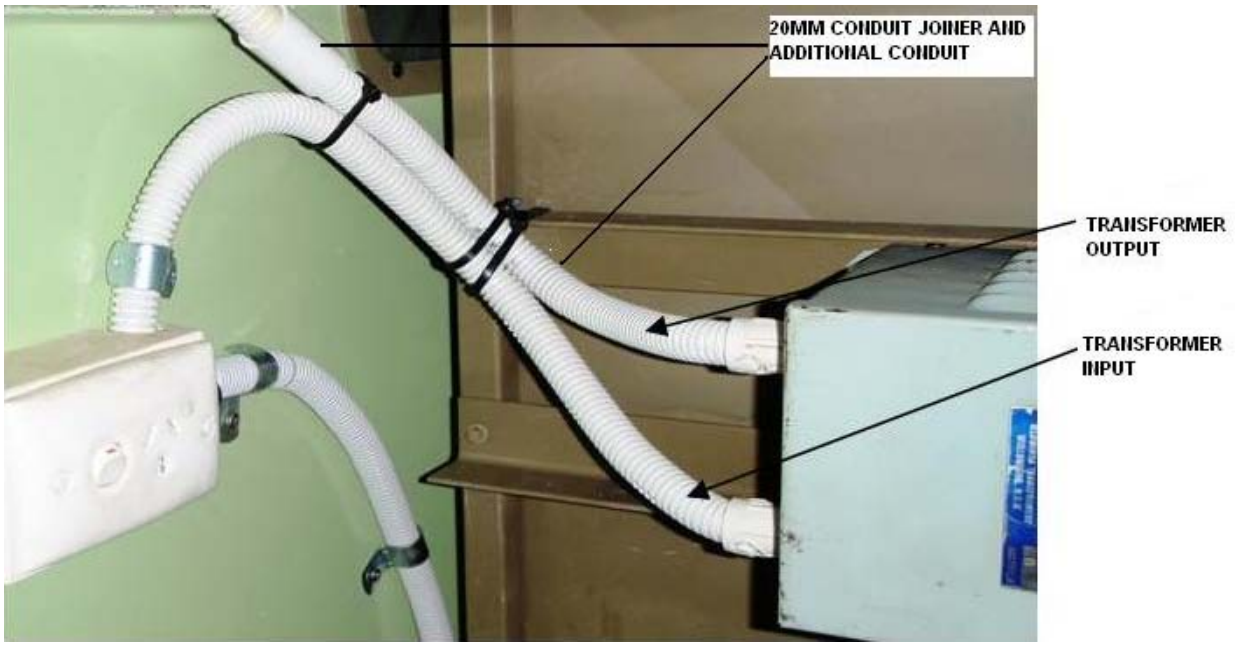

Figure 9 Transformer Final Assembly Position

19. Charger Wiring. Install the battery charger wiring as follows:

a. Drill a 22 mm hole next to transformer output supply conduit using a 22 mm hole saw (Figure 10).

Figure 10 Drill 22 mm Hole

b. Feed a 1.20 m length of conduit through the 22 mm hole to the underside nearest the batteries (Figure 11).

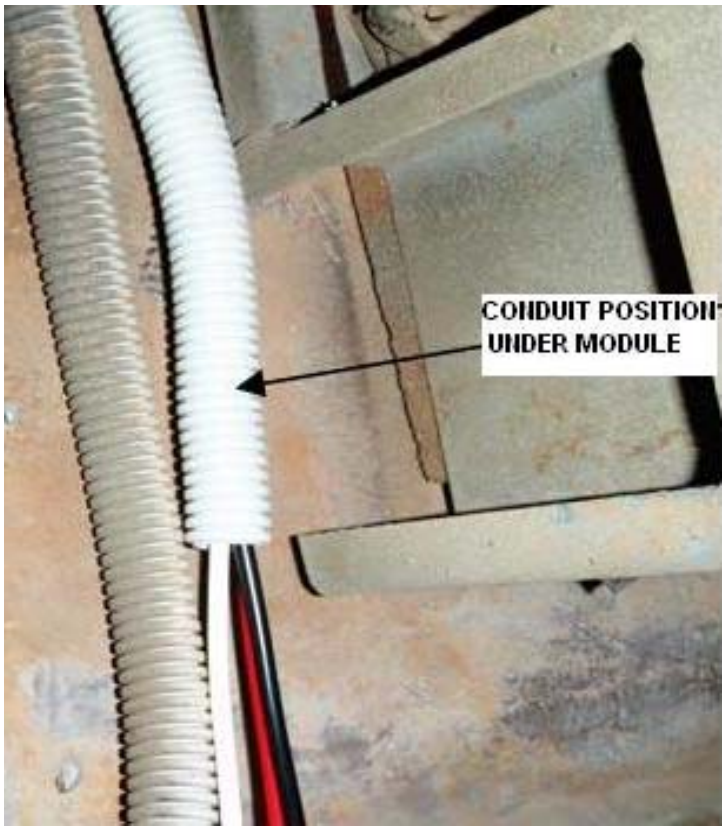

Figure 10 Battery Conduit Position

c. Feed 1.5 m lengths of red, white and black 6 mm automotive cable (Table 1, Items 6, 7 and 8) through the conduit (Figure 11).

d. Ensure that the cables can reach the battery terminals with the battery tray extended.

20. Battery Charger Support Panel. Fit the battery charger support panel as follows:

a. Place the panel (Table 1, Item 2) in position on the underside of the bench where the old battery charger was positioned.

b. Mark the mounting holes with the panel positioned approx 50 mm inboard from the front of the module.

c. Centre punch and drill the six 9 mm holes.

d. Fit six 6 mm rivnuts using a suitable rivnut insertion tool.

e. Secure the panel using six screws, spring and flat washers (Table 1, Items 15, 16 and 17).

f. Place heat shrink over the red, white and black cables to act as double insulation.

g. Secure the corrugated conduit to the bench frame with a 20 mm saddle clamp (Table 1, Item 6) (Figure 12)

h. Secure the output cable to the support panel with a 12.7 mm ‘P’ clip (Table 1, Item 11) and a 5 mm screw (Figure 12)

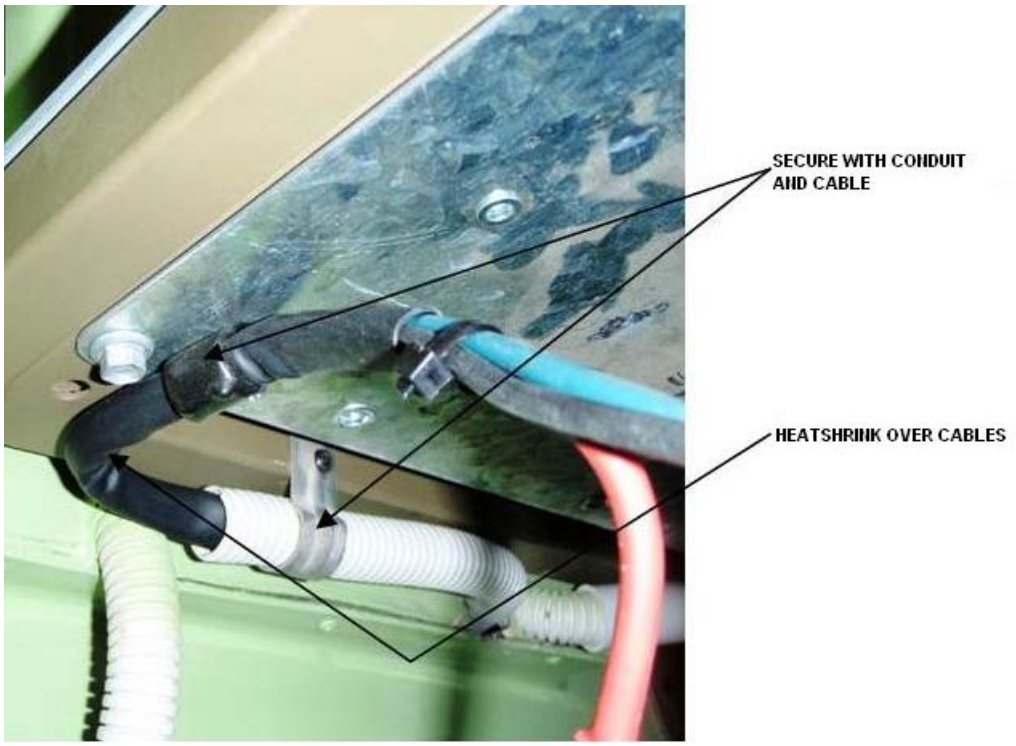

Figure 11 Battery Charger Support Panel and Cable Security

21. Battery Charger. Fit and wire the new battery charger as follows (Figure 12):

a. Position the battery charger on the support panel and secure the middle of the battery charger with six 15 mm screws with spring and flat washers.

b. Align the remaining mounting holes and secure them with the remaining four screws, flat and spring washers.

c. Cut the red, white and black wires to the required length.

d. Fit colour matching heat shrink tubing (Table 1, Items 11, 12 and 13) over the wires.

e. Fit an 8 mm eye crimp connector to each wire, crimp firmly and mould the heat shrink.

f. Wire the corresponding wires to the terminals as shown in Figure 12 (Red – 24 V, White – 12 V and black – earth).

g. Cable tie the wires and secure them with a 12.7 mm ‘P’ Clip (Table 1, Item 11) and a 5 mm screw (Table 1, Item 10).

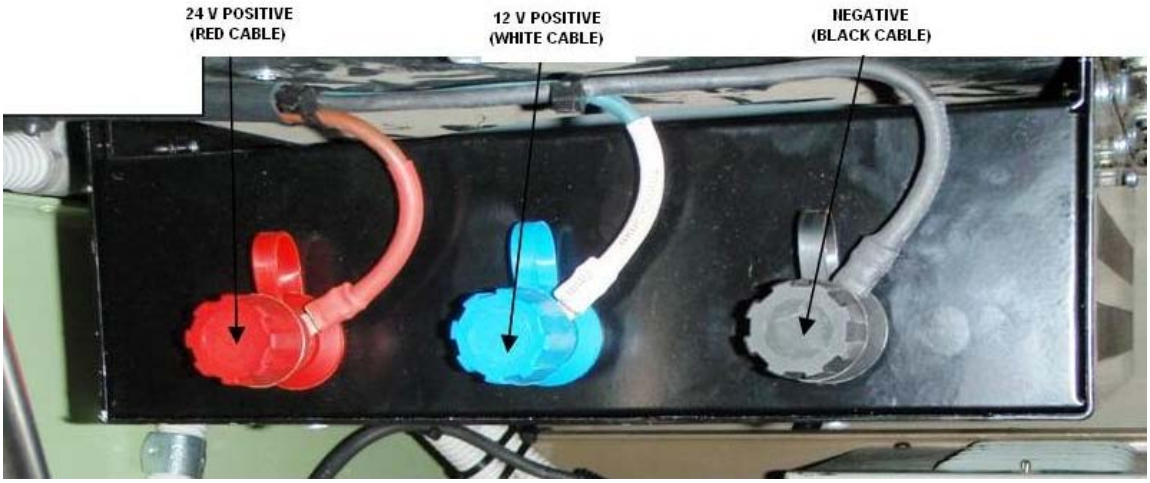

Figure 12 Wiring Battery Charger Output

h. Battery Connection. Wire the batteries as follows (Figure 13):

(1) Cut the red, white and black wire to the correct length to run parallel to the alternator charging wires.

(2) Fit colour matching heat shrink over the wires.

(3) Fit an 8 mm eye crimp connector, crimp firmly and mould the heat shrink.

(4) Fit the red wire to 24 V positive, the white wire to 12 V positive and the black wire to negative (Figure 14).

(5) Use cable ties to secure the wiring, ensuring that the battery tray can be moved feely.

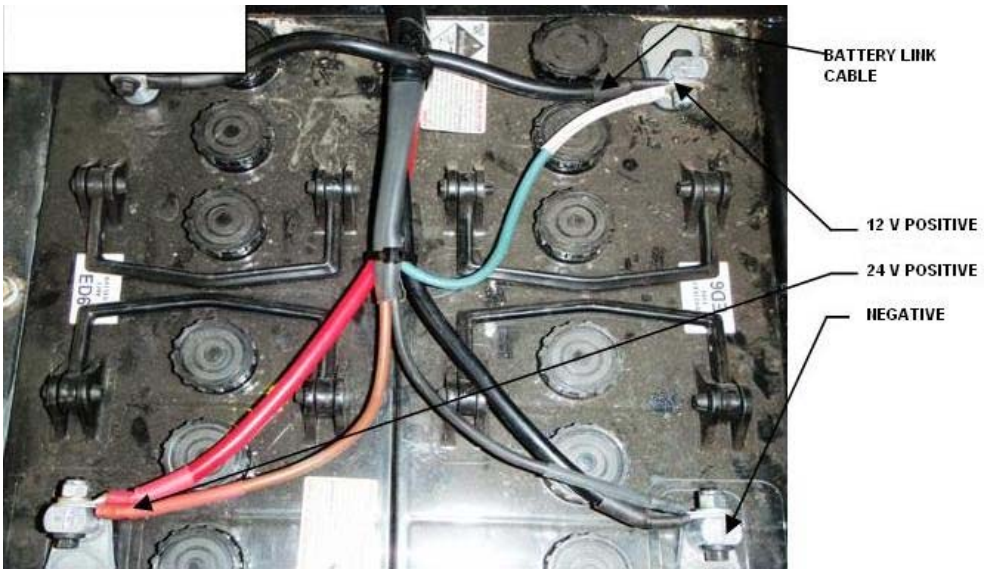

Figure 13 Wiring to Batteries

22. Mains Supply. Wire the new charger to mains as follows:

a. Remove the power point front cover from the mounting block.

b. Drill a 16 mm hole in the mounting block and fit a 16 mm cable gland (Table 1, Item 22).

c. Fit a length of 10 mm split conduit to the battery charger mains supply cable.

d. Wire in parallel with transformer supply wiring (figure 14) to the power point terminal block.

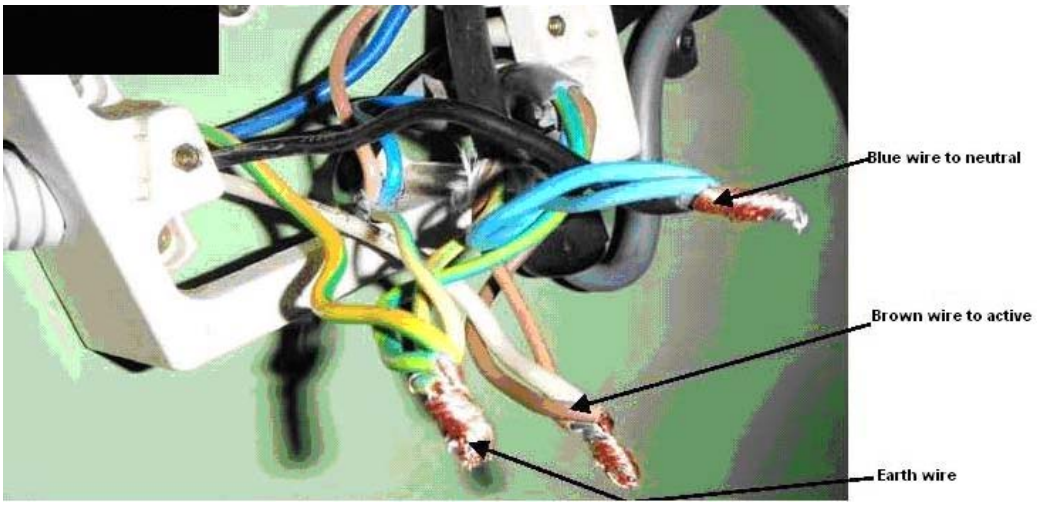

Figure 14 Battery Charger Mains Wiring

e. Refit the power point front cover.

f. Cable tie to ensure security of cables (figure 15)

Figure 15 Battery Charger And Transformer Wiring Completed

23. Post Modification Testing.

a. Reconnect the battery cable and fit the battery cover.

b. Check all connections are secure.

c. Connect mains supply to the module.

d. Select 240 V on the centre selector switch.

e. Select mains on the right-hand selector switch.

f. Check the voltage reading on meter.

g. Change the right-hand selector switch to battery

h. Check the voltage reading on the meter

i. The voltage reading should be similar for both positions. If not, recheck charger output at the charger to confirm the charger is operating.

24. Recording Action. On completion of the modification, the following action is to be taken in accordance with the TRAMM-L:

a. Deface the number 2 on the module modification record plate.

b. Complete the modification details in the GM 120 – Record Book for Service Equipment part 3.

c. Forward the modification completion details using form GM 119 – Advice of Change in Build State to:

ADFLM LtB Vehicles
CGSVSPO, DMO
DPM-07-154
Defence Plaza Melbourne
661 Bourke St
MELBOURNE VIC 3000

END

Distribution List: **VEH G 20.3 – Code 2** (Maint Code)
(Sponsor: CGSV SPO, Light B Vehicle Section)
(DMO Job No ECO LTB 026/10)