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PRODUCT DESCRIPTION DOCUMENT FOR:

UK LIGHTING CONVERSION KIT

Applies to product codes: UKK (Full Kit)
UKL (Lights Only, without switching unit)
UKU (Switching Unit Only, without lights)

DOCUMENT REFERENCE: UKK - PDD - Issue 1

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SECURITY LEVEL: UNCLASSIFIED (may be freely distributed)

1. INTRODUCTION AND PROBLEM DESCRIPTION

Many American vehicles, including the 3rd-generation Trans-Ams on which the Knight Rider replica vehicles are based, do not have amber-colored turn indicator lamps in the rear light cluster. Instead, they flash the brake lamps to double as rear turn indicators. Although this is street-legal in the US, this is not the case in the UK and many MoT stations will now not pass vehicles with this lighting configuration. It is required that additional (amber-colored) lamps are fitted to the rear of the vehicle and that these amber rear turn indicator lamps are connected completely independently of the brake lamps, (The brake lamps must not flash when indicating and the amber turn indicators must not come on when braking).

This presents the UK-based owner with two tasks:

1. How to re-wire the electrics correctly to give street-legal operation

and

2. Where and how to fit the additional amber-colored lamps so as not to look unsightly and spoil the "lines" of the car

In addition to this, UK regulations also require one or two rear fog lamps to be fitted to all vehicles. This is not accommodated in the stock Trans-Am configuration, giving a third problem:

3. Where and how to fit the rear fog lamp(s) so as not to look unsightly and spoil the "lines" of the car

Knights of England offer a kit which solves all of these problems, which is described in this document.

2. STOCK CONFIGURATION

The stock configuration for the rear light cluster has the following lamps on each side:

- | | | |
|---|---|--|
| 1 x single element 21-watt lamp (white) | - | used for reverse lamps |
| 2 x dual-element 5-watt & 21-watt lamps (red) | - | 5-watt elements used as tail lamps,
21-watt elements used as combined brake and rear turn-indicator lamps |
| 1 x single-element 5-watt lamp (red) | - | used for tail lamps |

The diagram of figure TBD shows the stock configuration of the wiring relating to all rear lights on the Trans-Am.

3. HOW THE UK LIGHTING CONVERSION KIT SOLVES THE PROBLEM AND WHAT IT INCLUDES

The problem of the rear turn-indicator lamps is solved by adapting two high-level brake-lamp assemblies and "implanting" them within the stock rear cluster, replacing the red filter on these high-level brake lamps with amber-colored filter. The stock lighting cluster has a convenient hollow section immediately above the stock lamps, which is just the right size to accommodate the amber turn-lamps which we supply. Also, note that this hollow section is not covered by the rear light cluster's red filter section and so there is absolutely no "cutting up" of the stock components required - simply the fitting of additional parts.

The problem of the rear fog-lamps is solved by replacing the two outer lamp sockets in the stock cluster (which are for single-element lamps) with sockets suitable for dual-element lamps. The 5-watt elements are used for the tail-lamp function (as in the stock configuration), whilst the new 21-watt elements are connected together and used for the rear fog-lamp function. This provides rear fog lamps, again without altering the overall lines of the car by additional bolt-on lamps.

The Knights of England kit allows the option of easily switching between the standard US-configuration and the UK-configuration via a single low-power switch to ground (eg on one of the switch-pods). This is achieved by means of a power relay-switching unit. This relay-unit also allows the hazard warning lamps to be switched on via a low-current switch to ground (eg on one of the switch-pods), rather than using the stock hazard switch on the right-hand side of the steering column.

The complete kit for UK lights conversion is designated by the product code UKK. However, you can order:

1. The complete kit, incorporating UKL and UKU below. (The complete kit is ordered by the code **UKK**).
2. Just the light units (high-level brake light assemblies suitable for fitting into stock rear light cluster, twin-element sockets and bulbs suitable for replacing outer tail lamps with combined tail / rear fog lamps) plus associated wiring but **without** the relay switching unit. The lights and wiring harnesses alone without the switching unit may be ordered under the product reference code **UKL**,
3. Just the relay switching unit (**without** any associated lamps, sockets or wiring) if you wish to select your own light assemblies, or install switchable US/UK-legal lighting on an American vehicle other than a Trans-Am. The switching unit alone without the lights and wiring harness may be ordered under the code **UKU**.

IMPORTANT NOTES:

The switching unit pulls a small current when operating in UK mode (the internal relays are powered in this mode). When operating in US mode, the internal relays are depowered and no current is drawn. Although this current is negligible in normal operation, it is recommended that if the vehicle is not to be driven for long periods, the unit should be switched to the "US Mode" (switch to pin13 of the switching unit is open), as this will ensure that the unit is pulling no current.

The photographs in figures 1 and 2 show all the stock electrical connectors which are mounted to the steering column and will assist you in identifying the connectors which must be joined to for connection of the product described in this document.

Some MoT Testing stations are now starting to question the amber-colored parking lamps at the front of the vehicle (or "side-lights" as we call them in the UK). Do not confuse this term "side-lights" with "side-marker lamps", which is the American term for the lights on the side of the vehicle which remain illuminated when parking lights (sidelights) and / or headlights are on. Unlike the problem of converting the rear lights, the front light conversion (if this is necessary on your vehicle to get it through the test), is a much more straight-forward task. It simply involves adding additional 5-watt white lamps at the front of the vehicle and running the feed which normally goes to the 5-watt element of the twin-element front amber combined turn / parking lamps to these new separate white lamps instead. There is no inter-connection with other circuits involved as there is on the back lights where the turn and brake functions must be separated from each other. It simply involves re-routing two wires to separate lamps. A relay could even be used to switch over these lamps when switching to "UK Mode". This option will be available shortly as well, but will incur a slight additional cost.

4. INSTALLATION INSTRUCTIONS

4.1 FIT THE ADDITIONAL LAMPS AND WIRING LOOM (PRODUCT UKL)

4.1.1 Remove the outer cover from the left and right rear light clusters. This will require prying them off - the covers are held on by a bead of gray sealant which is very difficult to get off clothes and skin - overalls and gloves are recommended.

4.1.2 Fit the additional rear turn lamp assemblies (adapted from the high level brake lamp assemblies supplied) and cut and fit a section of the amber-colored filter inside the rear cover which was removed in 4.1.1.

4.1.3 Drill two small holes in the rear of each light cluster in a position suitable to feed through the wires to the new rear turn lamp assemblies, fitted in 4.1.2. Connect wires to these new lamps as per the diagram of figure 4 or 5 and run these wires behind the trim to the front of the car alongside the original wiring loom. The standard wire colors used for these wires by Knights of England are: left = red ; right = blue ; ground = black

Connect the new ground wire to a suitable point on the body (eg where the stock rear lighting loom is grounded to the body).

4.1.4 Replace the single-element sockets from the outer-most lamps on each side with twin-element sockets and replace the single-element 5-watt bulbs with twin-element 5 / 21 watt bulbs. Connect the ground connections and 5-watt element connections from the old sockets to the corresponding connections on the new sockets. Now join the new 21-watt elements of each of these outer bulbs together and run a wire from here to the front of the car for connection to a 12 V switched feed for rear fog lamp power (eg via a relay, not supplied). Standard wire color used by Knights of England for feed to the rear fog lamps is white.

4.2 PERFORM THE NECESSARY RE-WIRING

If you are installing the complete conversion kit (product UKK), which includes the lamps (product UKL) and the switching unit (product UKU), or if you are installing product UKU and your own lamps, then please follow the instructions in 4.2.1.

If you are installing the lamps only (product UKL) without the switching unit and you wish to hard-wire these lamps into permanent UK-mode operation, then please follow the instructions in 4.2.2

4.2.1 FITTING THE COMPLETE KIT (LAMPS AND SWITCHING UNIT)

The revised wiring is depicted in figure 4. This diagram should be referred to whilst following the instructions below. Note that in the diagram, solid lines represent original wiring, whilst dashed lines represent new or modified wiring.

Find a suitable location for the switching unit and mount it securely.

Cut the yellow wire which runs from pin M of the connector on the right hand side of the steering column to the rear left brake / US-turn lamps. Join the end which comes from the steering-column mounted connector to pin 1 of the switching unit and join the end which goes to the rear light cluster to pin 11 of the switching unit.

Cut the dark green wire which runs from pin N of the connector on the right hand side of the steering column to the rear right brake / US-turn lamps. Join the end which comes from the steering-column mounted connector to pin 3 of the switching unit and join the end which goes to the rear light cluster to pin 9 of the switching unit.

Cut the white wire which runs from the pedal-mounted brake-lamp switch to pin P of the steering-column mounted connector. Join the end which comes from the brake-lamp switch to pin 10 of the switching unit and join end which goes to pin P of the steering-column mounted connector to pin 2 of the switching unit.

Splice into the light blue wire which runs from pin H of the steering-column mounted connector to the front left turn lamps (via the bulkhead connector) and run a wire from here to pin 4 of the switching unit. This connection is only required if the auxiliary hazard-switching function is required (eg via a switch in the switch pods).

Splice into the dark blue wire which runs from pin J of the steering-column mounted connector to the front right turn lamps (via the bulkhead connector) and run a wire from here to pin 5 of the switching unit. This connection is only required if the auxiliary hazard-switching function is required (eg via a switch in the switch pods).

Splice into the brown wire which runs from the hazard lamp flasher unit to pin K of the steering-column mounted connector. Run a wire from here to pin 6 of the switching unit. This connection is only required if the auxiliary hazard-switching function is required (eg via a switch in the switch pods).

Run a wire from pin 13 of the switching unit to a switch which connects to ground (label this "UK LIGHTS". If you have a suitable indicator on the dash (eg on the Knights of England custom dash to be available shortly), then splice also join this point to the negative end of that indicator, whilst joining the positive end to a continuous 12 V supply (eg via the "CTSY" fuse).

Run a wire from pin 7 of the switching unit to a switch which connects to ground (label this "HAZARD". This connection is only required if the auxiliary hazard-switching function is required (eg via a switch in the switch pods).

Run a wire from downstream of the "CTSY" fuse in the fusebox (continuous 12V power) to pin 14 of the switching unit.

Join the wire which runs from the new rear left amber UK turn lamp to pin 12 of the switching unit

Join the wire which runs from the new rear right amber UK turn lamp to pin 8 of the switching unit

4.2.2 FITTING THE LAMPS ONLY (WITHOUT SWITCHING UNIT) AND HARD-WIRING TO UK MODE

The revised wiring is depicted in figure 5. This diagram should be referred to whilst following the instructions below. Note that in the diagram, solid lines represent original wiring, whilst dashed lines represent new or modified wiring.

Cut the yellow, white and dark green wires which go to the steering-column mounted connector, a few inches from the connector itself. Join the ends of these three wires together (the ends which come from the harness, not the ends which join to the connector - see diagram). This removes the turn function from the rear brake lamps and connects them permanently to the output from the brake switch and nothing else.

Join the red wire coming from the new rear left amber turn lamp assembly to either:

- a. The yellow wire coming from the steering-column mounted connector (just cut) - this is the configuration shown in the diagram of figure 5

or

- b. Splice it into the light blue wire running to the front left turn lamps. (see note)

Join the blue wire coming from the new rear right amber turn lamp assembly to either:

- a. The dark green wire coming from the steering-column mounted connector (just cut) - this is the configuration shown in the diagram of figure 5

or

- b. Splice it into the dark blue wire running to the front right turn lamps. (see note)

note: This option will be required if you want the rear turn / hazard lamps to flash with the front ones when triggered by an alarm. Note that in US mode, or if UK mode is wired as in "a", it is not possible for an alarm to flash the front and rear turn lamps together (unless some further rewiring is done), because when the turn switch is in the central position and the hazard switch is off (as they would be when the alarm is set), then the rear brake / US turn lamps are connected only to the brake switch and are not commoned with the corresponding front turn lamps (unlike in UK vehicles, where all the left hand turn lamps will be joined together and all the right hand turn lamps will be joined together). If you have any further questions regarding which option to use here, please contact us at:

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Also note that when UK mode is in use via the switching box (4.2.1), then it is connected as in (a), so the rear turn lights are not common with the corresponding front ones.

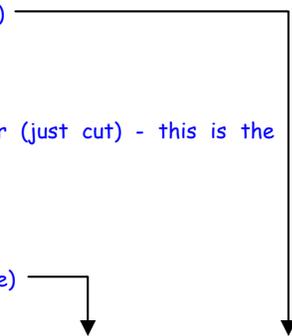
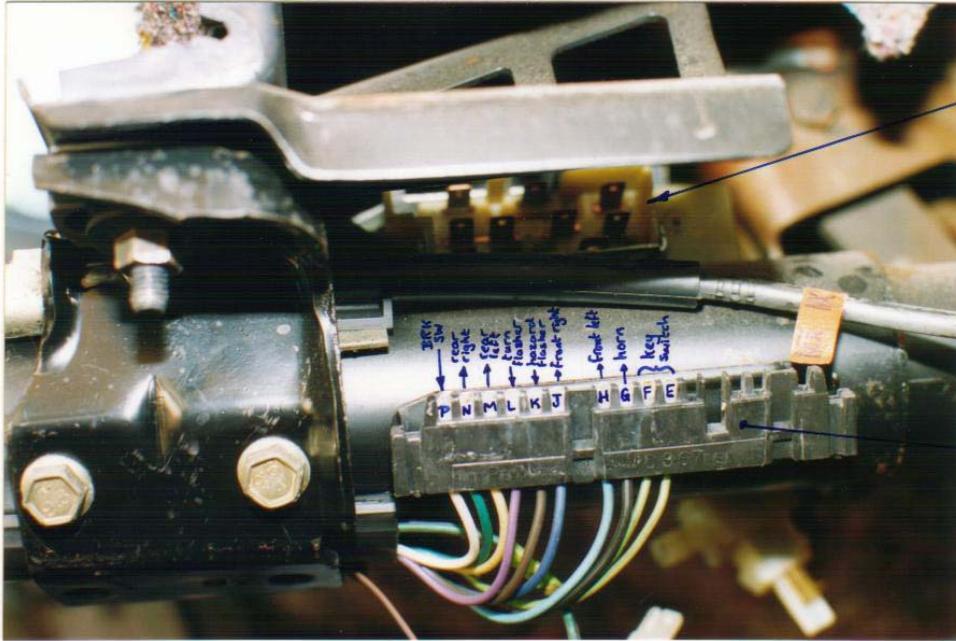


FIG 1: STEERING COLUMN SWITCHES

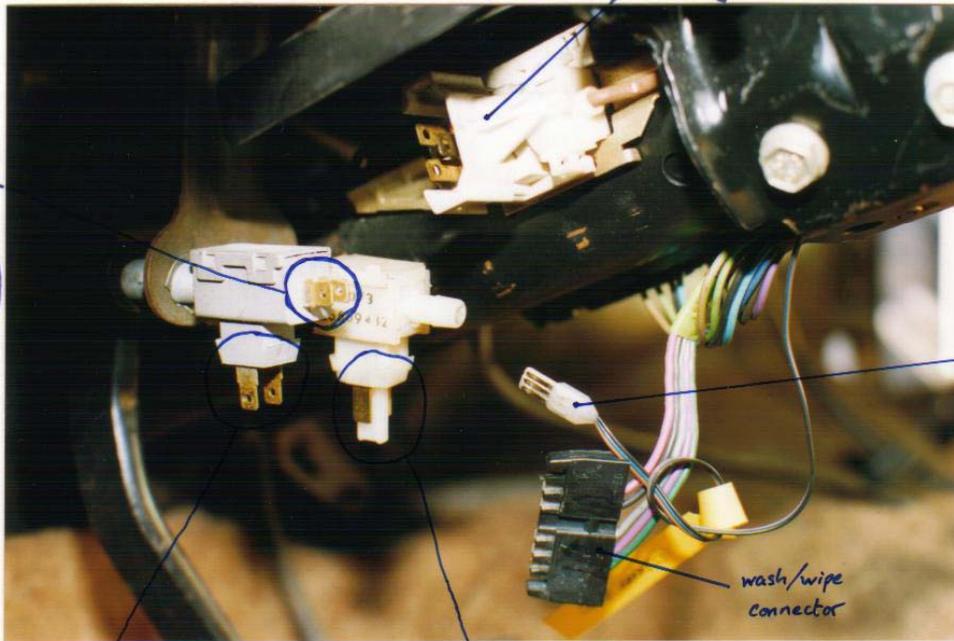
STEERING COLUMN SWITCHES



ignition switch

turn/horn/key switch connector

FIG 2: MORE STEERING COLUMN SWITCHES



dipped beam/full beam change-over switch.

Brake switch contacts for cruise control operation
(contacts normally closed - open only when brake pedal pressed)

cruise harness connector

wash/wipe connector

Brake switch for brake lights
(contacts normally open - closed when brake pedal pressed)

Brake switch for ECM control of TCC - Torque Converter Clutch
(contacts normally closed - open only when brake pedal pressed)

FIG 3: STOCK US WIRING CONFIGURATION (NOT UK-LEGAL)

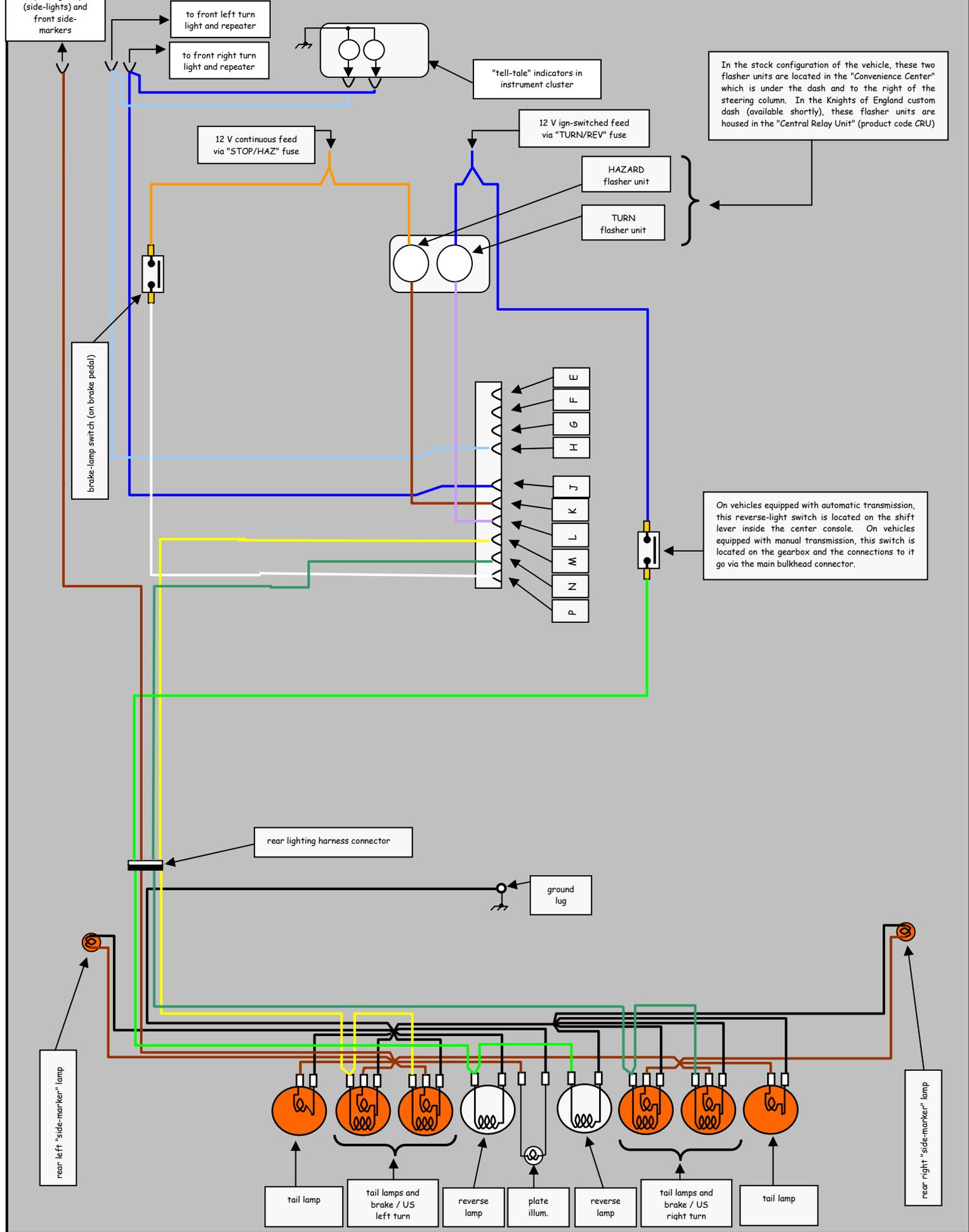
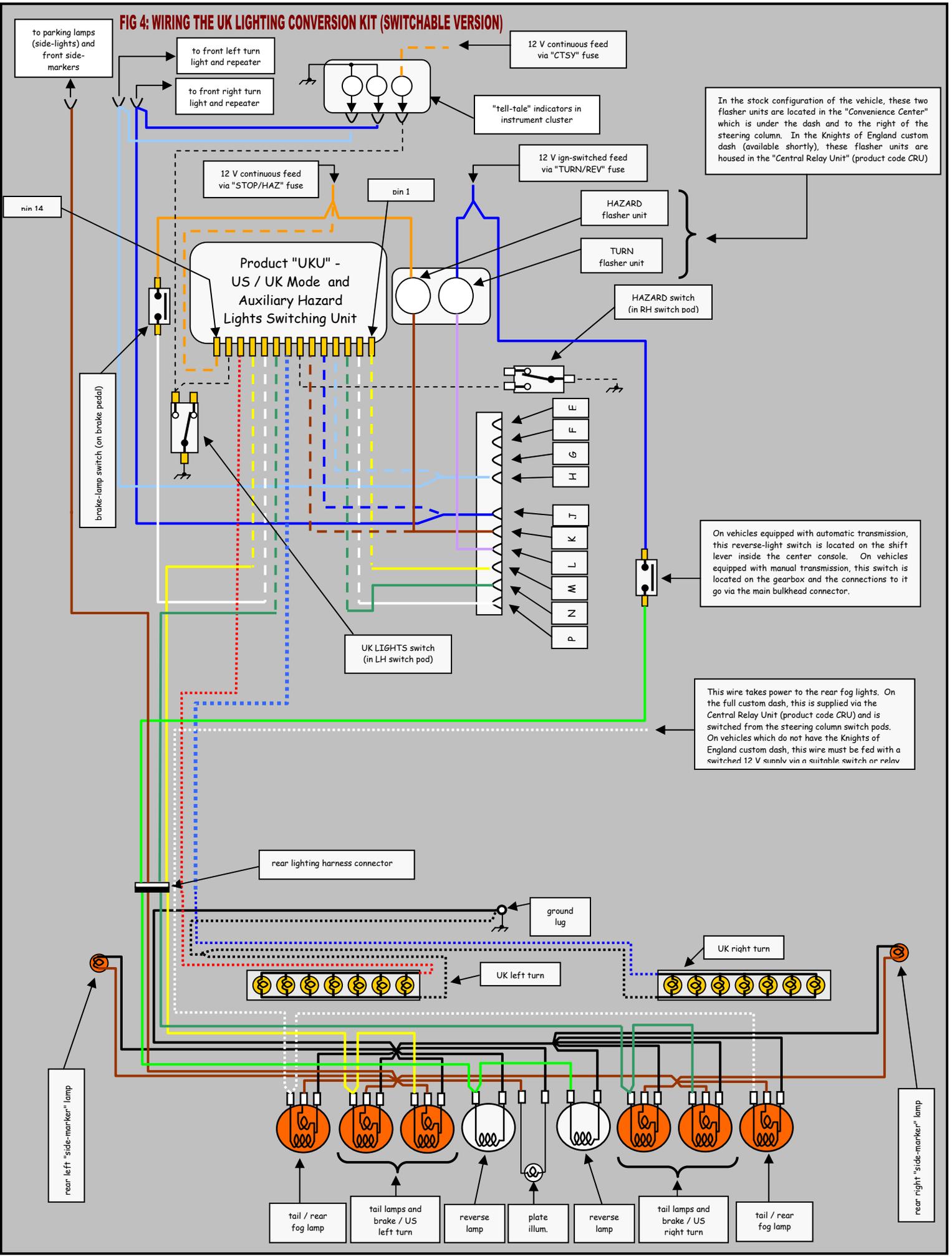


FIG 4: WIRING THE UK LIGHTING CONVERSION KIT (SWITCHABLE VERSION)



to parking lamps (side-lights) and front side-markers

to front left turn light and repeater
to front right turn light and repeater

12 V continuous feed via "CTS" fuse

"tell-tale" indicators in instrument cluster

In the stock configuration of the vehicle, these two flasher units are located in the "Convenience Center" which is under the dash and to the right of the steering column. In the Knights of England custom dash (available shortly), these flasher units are housed in the "Central Relay Unit" (product code CRU)

12 V continuous feed via "STOP/HAZ" fuse

12 V ign-switched feed via "TURN/REV" fuse

HAZARD flasher unit

TURN flasher unit

HAZARD switch (in RH switch pod)

Product "UKU" - US / UK Mode and Auxiliary Hazard Lights Switching Unit

brake-lamp switch (on brake pedal)

On vehicles equipped with automatic transmission, this reverse-light switch is located on the shift lever inside the center console. On vehicles equipped with manual transmission, this switch is located on the gearbox and the connections to it go via the main bulkhead connector.

UK LIGHTS switch (in LH switch pod)

This wire takes power to the rear fog lights. On the full custom dash, this is supplied via the Central Relay Unit (product code CRU) and is switched from the steering column switch pods. On vehicles which do not have the Knights of England custom dash, this wire must be fed with a switched 12 V supply via a suitable switch or relay

rear lighting harness connector

ground lug

UK right turn

UK left turn

rear left "side-marker" lamp

rear right "side-marker" lamp

tail / rear fog lamp
tail lamps and brake / US left turn
reverse lamp
plate illum.
reverse lamp
tail lamps and brake / US right turn
tail / rear fog lamp

FIG 5: WIRING THE UK LIGHTING CONVERSION KIT (NON-SWITCHABLE VERSION)

