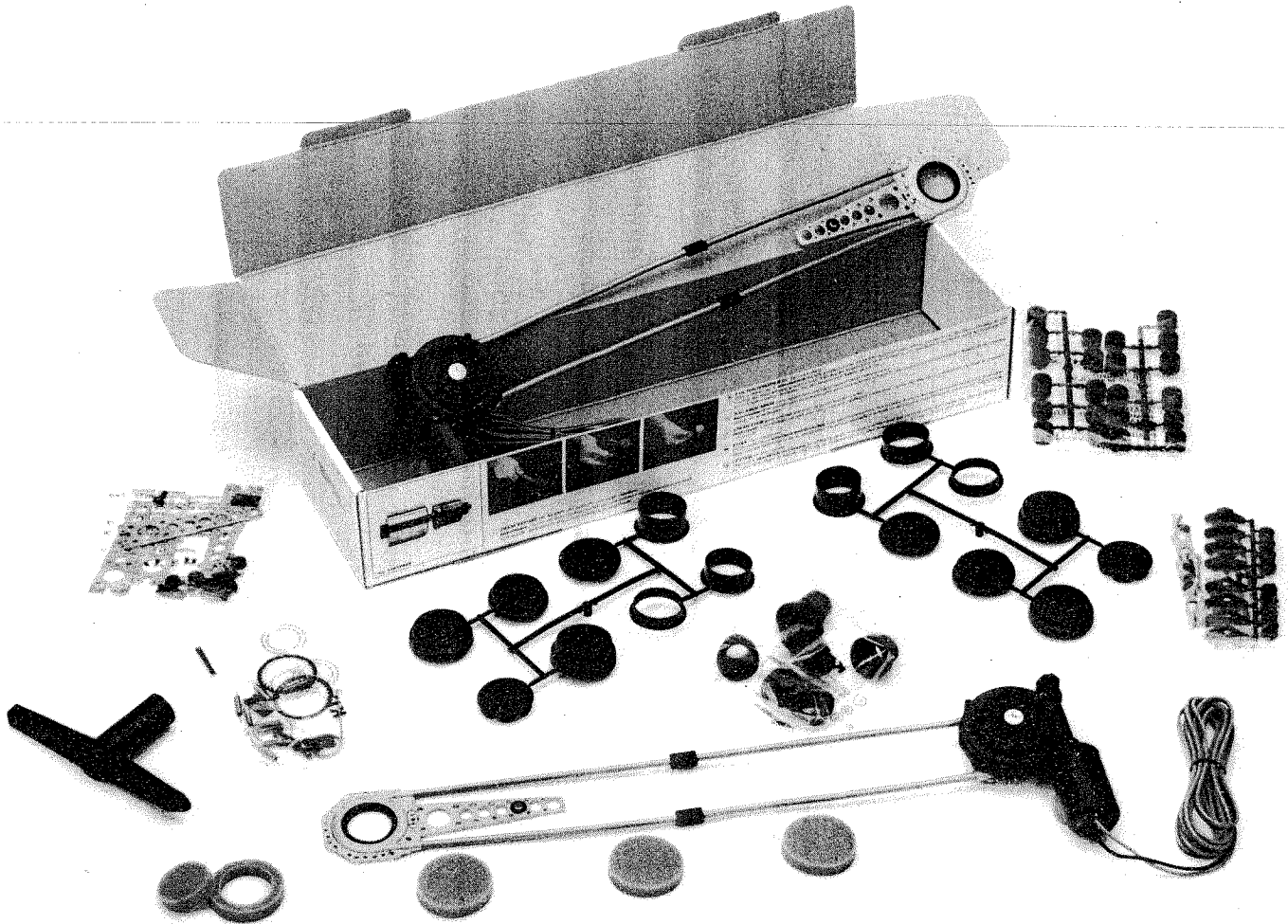




# SPAL<sup>®</sup>

## Universal power windows MOUNTING INSTRUCTIONS



- DETAILED INSTRUCTIONS FOR MOUNTING POWER WINDOWS ON THE **U.S.** CARS

(Please refer to the enclosed handbook for **European** and **Japanese** cars)

For further information, please contact:

**IEITC**

512 Tuttle Street - Des Moines, IOWA 50309-4618

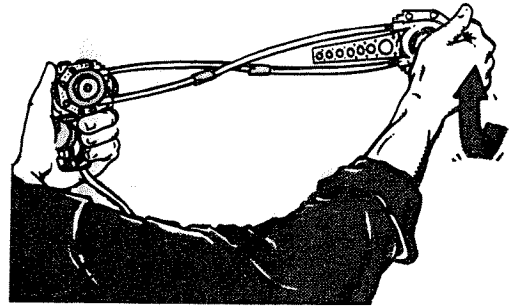
Tel (800) 245-0207 - Fax (515) 245-0070



## Power Window Installation Trouble Shooting Guide

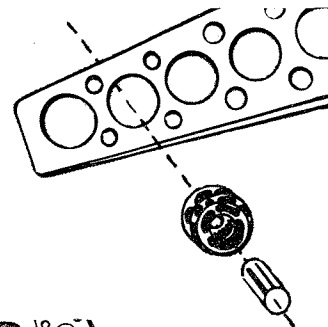
### Wiring:

- Never use self tapping connectors on SPAL Power Window Switch Kits. Always solder or use a high quality crimp type connector.
- When grounding, use a star type washer under your ring terminal. This will ensure that your ground will make good contact.
- Test all wires with a diode protected test light or multi-meter.
- Always use the correct fuse size for the application.



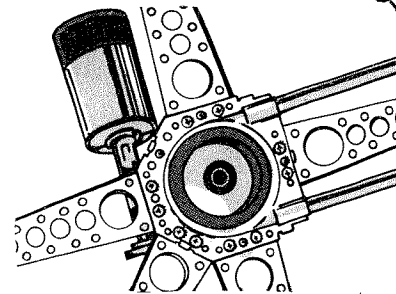
### Mounting:

- Always cross the transmission assembly into a figure 8.
- Use the supplied rubber grommets and foam pads for the mounting of the power window kit. They reduce noise and vibration.
- Utilize as many power window kit brackets as you can so that the motor is mounted as securely as possible.



### Trouble Shooting Tips:

- Check the fuse to see if it is blown.
- Check to make sure that the power supply that you have is supplying the proper voltage and current for both power and ground.
- If you have good power, check to see that the switch is working. If the switch does not, work refer to the proper wiring diagram found in the SPAL instruction manual.
- If the switch works, you will need to confirm that the motor wires are connected. Sometimes they do become caught in the window regulator and pull away from the motor terminals. This is easily resolved by pulling back the rubber boot and re-soldering the wire to the terminal.



After following the above steps, if you continue to have problems, feel free to call our Technical Support Department at 800-454-7725. We can help you trouble shoot and solve any problems you may encounter.

**SPAL Technical Support**  
512 Tuttle Street  
Des Moines, IA 50309 USA  
Toll Free: 800-454-SPAL (7725)  
Fax: 515-245-2878

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# GENERAL INDEX

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## SWITCH CONNECTION DIAGRAMS

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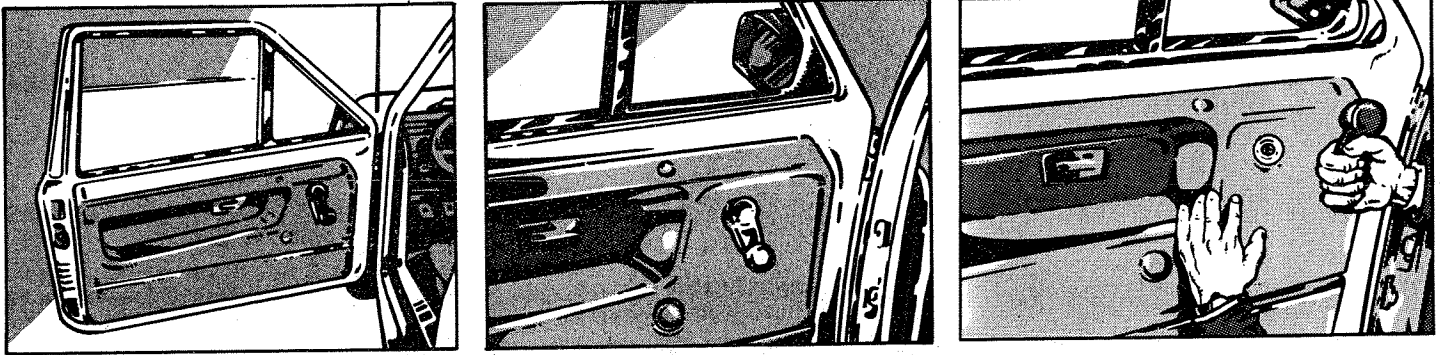
4

## ELECTRICAL WIRING DIAGRAMS

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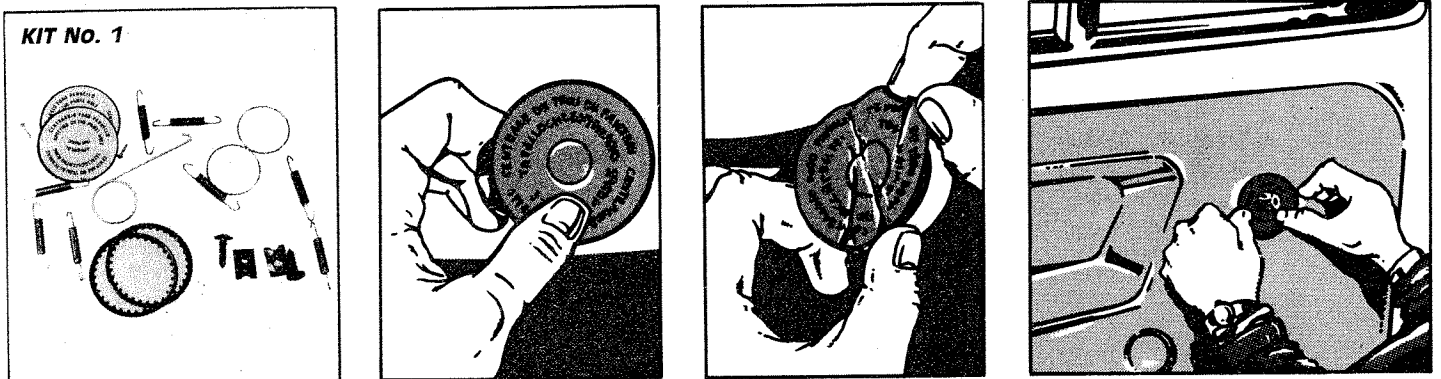
1

## REMOVE HANDLE FROM WINDOW REGULATOR/PIVOT



2

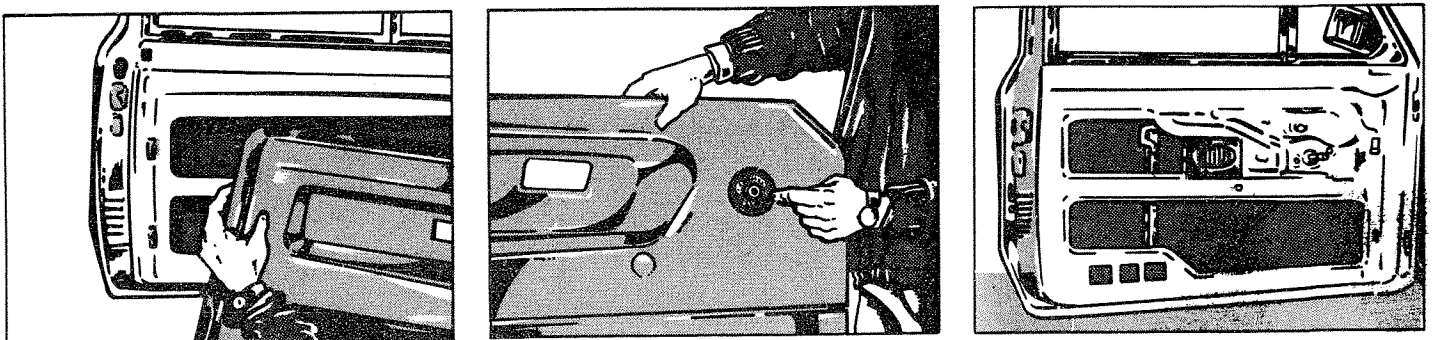
## APPLY CENTERING ADHESIVE TO THE PANEL



Place adhesive over regulator making sure that it adheres properly to door panel.

3

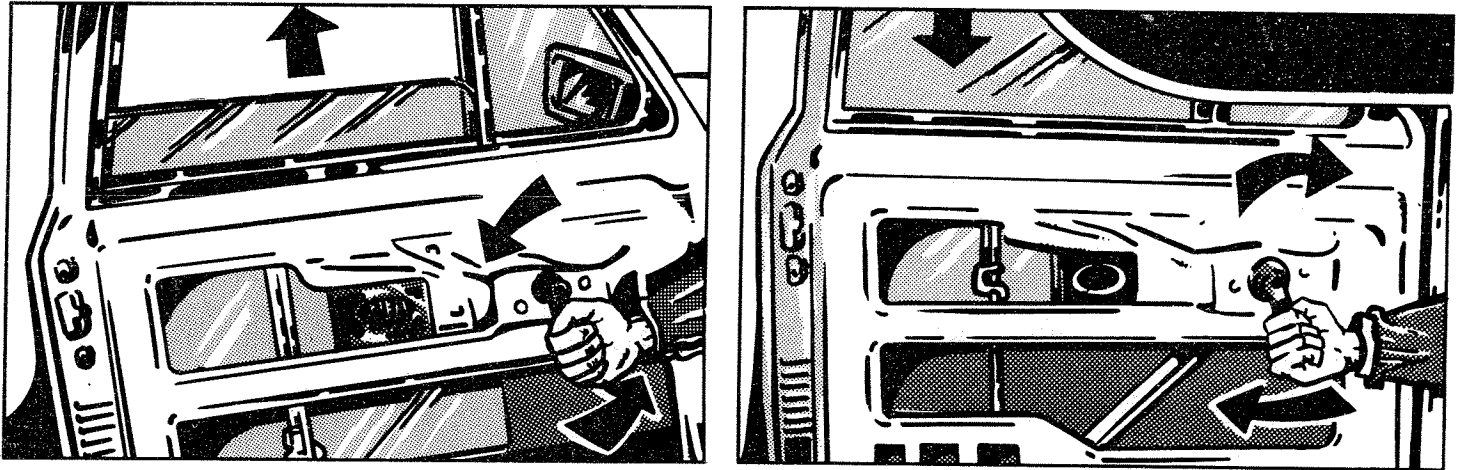
## PANEL REMOVAL



Remove door panel.

When the adhesive is firmly applied to the panel

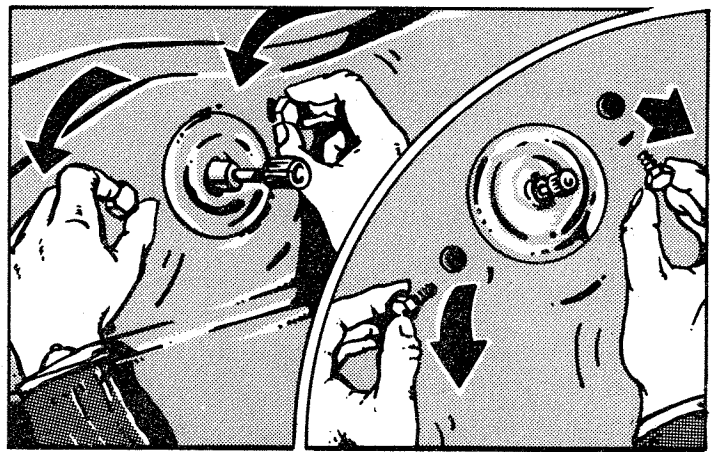
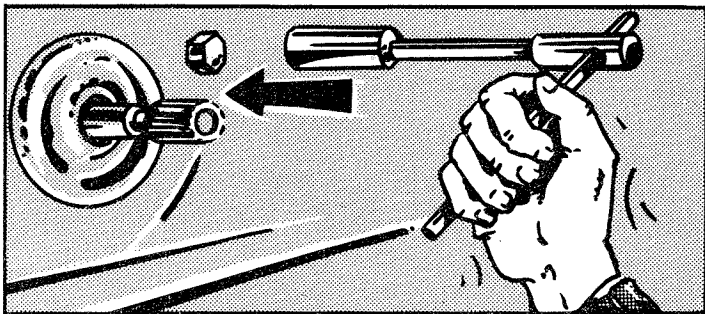
# MANUALLY CHECK THE MOVEMENT OF THE WINDOW



Adjust the track if the window does not operate freely.

## OPTIONAL OPERATION:

A • IN ORDER TO USE THE SMALLEST FINISHING CAP ON SOME VEHICLES, IT MAY BE NECESSARY TO MOVE BACK THE WINDOW REGULATOR ASSEMBLY.



B • AFTER REMOVING ORIGINAL BOLTS FROM THEIR SEATS, REFER TO THE TABLE BELOW TO CHOOSE SUITABLE SPACERS AND BOLTS (SUPPLIED IN KIT No. 2).

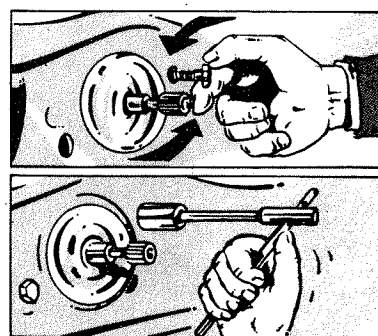
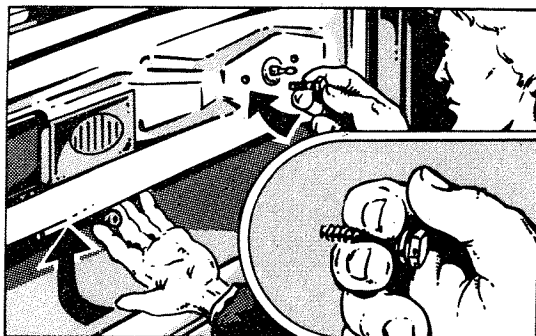
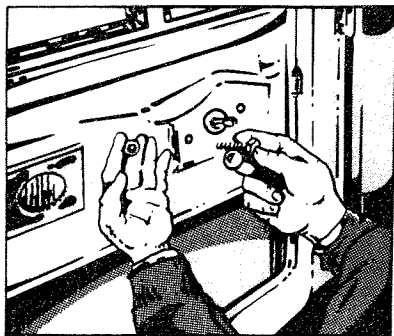
KIT No. 2



### KIT No. 2

Trapezoidal spacers h. 5/16"	Bolts h. 3/8"
Trapezoidal spacers h. 3/16"	Bolts h. 9/16"
Trapezoidal spacers h. 3/8"	Bolts h. 3/4"

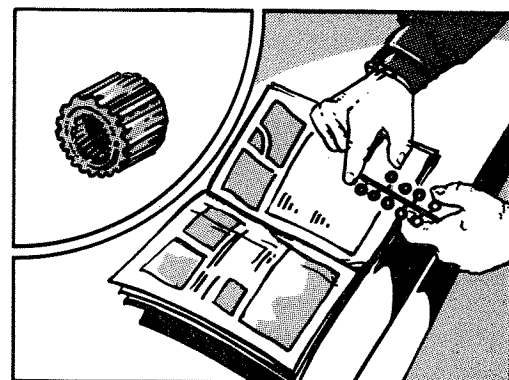
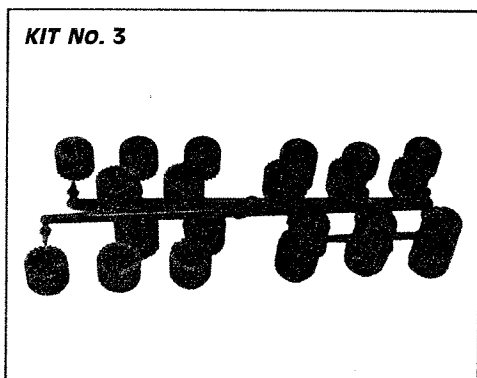
## C • INSERT SPACERS BETWEEN MANUAL MECHANISM AND DOOR PANEL.



Check that the bolts of the window assembly are tight.

6

## FIT PRIMARY ADAPTOR ONTO REGULATOR PIVOT



From Kit No. 3, choose the correct adaptor for the model of vehicle. See adaptor Table below.

### Adaptor table (Kit No. 3)

N. 1 ALFA ROMEO - AUTOBIANCHI - BEDFORD - DAF  
DATSUN - FIAT - LANCIA - MERCEDES - NISSAN  
OPEL - PORSCHE - SAAB - SUBARU

N. 2 ARO - CITROËN - PEUGEOT - RENAULT - SEAT  
TALBOT

N. 3 AUDI - BMW - FIAT - FORD (EUROPE)  
PORSCHE - VOLKSWAGEN - VOLVO

N. 4 AUSTIN ROVER

N. 5 VAUXALL - JAGUAR - BEDFORD - ROVER

N. 6 FORD (UK)

N. 7 OPEL

N. 8 DAIHATSU - MITSUBISHI - TOYOTA - SUZUKI  
CHEVROLET - G.M. - GEO - PONTIAC -  
HYUNDAI

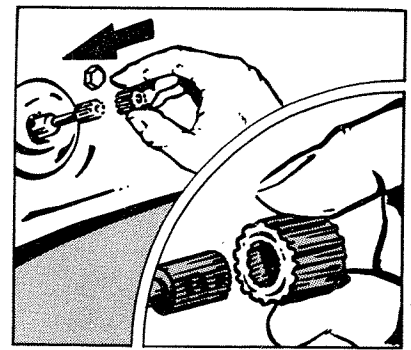
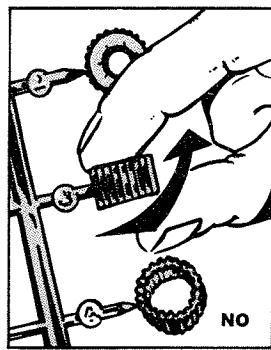
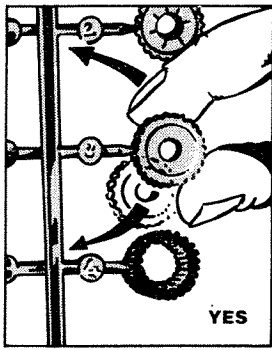
N. 9 HONDA

N. 10 MAZDA

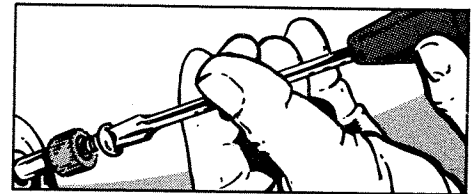
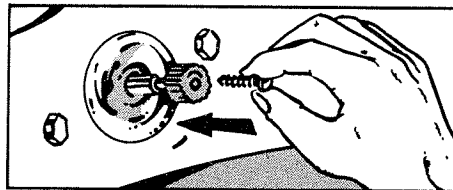
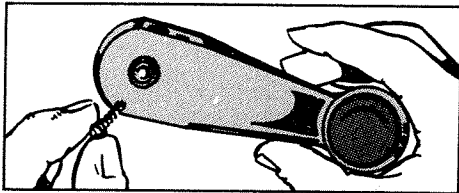
N. 11 ISUZU

N. 12 FORD (U.S.A.)

N. 13 DODGE - CHRYSLER - PLYMOUTH



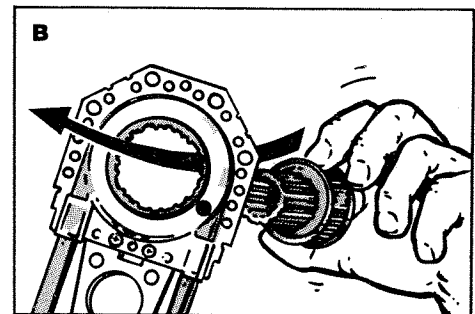
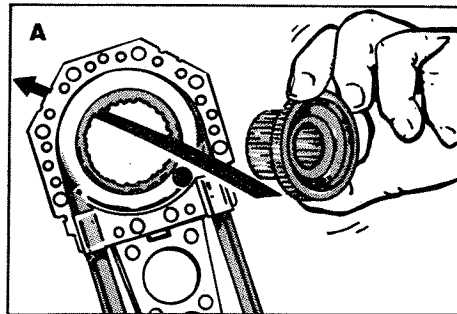
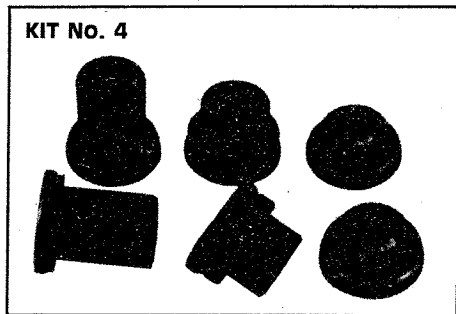
Take caution in removing adaptor from Kit. Do not twist-off.



If the handle is attached with a screw, use it to fix the adaptor.

7

## INSERT SECONDARY ADAPTOR INTO THE TRANSMISSION

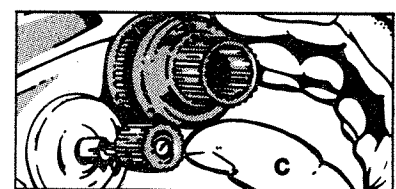
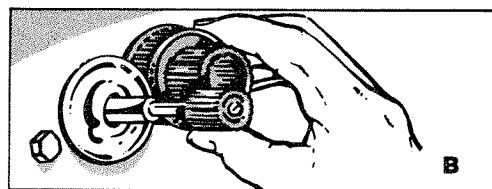
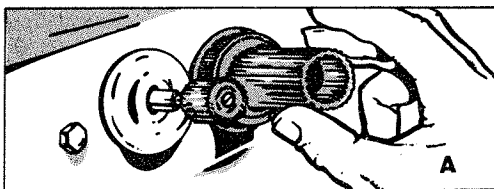


Secondary adaptor to be inserted towards inside of vehicle.

A) Insertion from the red marked side.

B) Insertion from the opposite side of the red mark.

## Gear Conversion



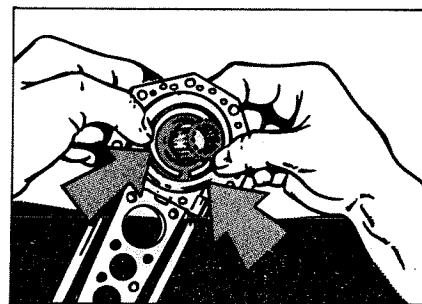
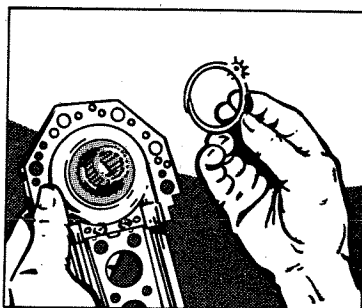
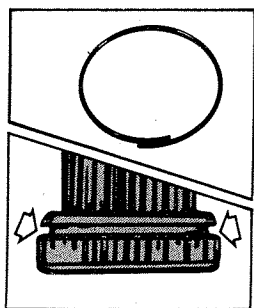
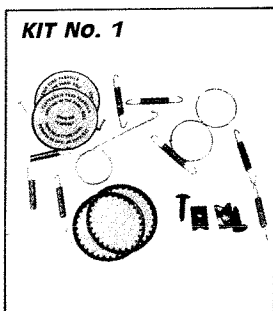
A) Wrong: too long.

B) Wrong: too short.

C) Right: length of secondary adaptor and pivot are the same.

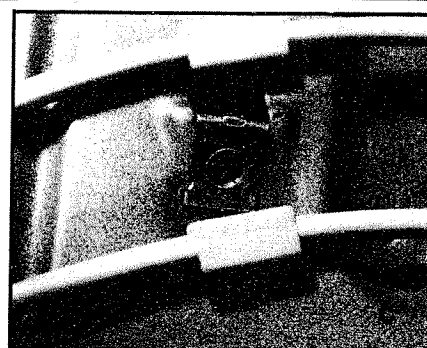
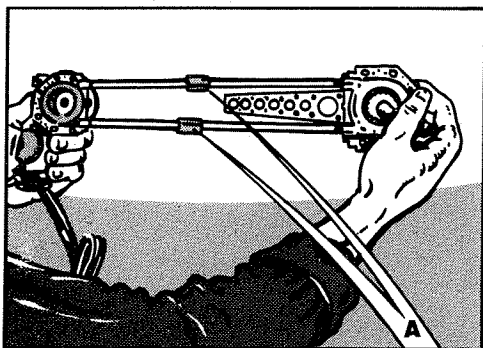
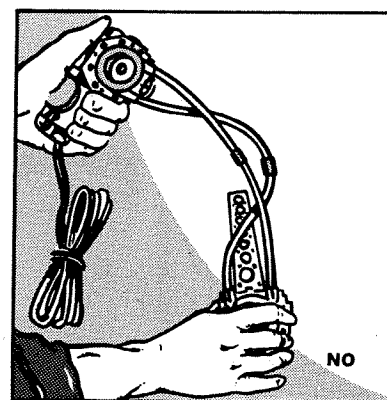
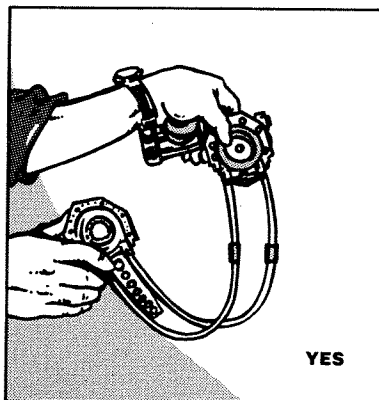
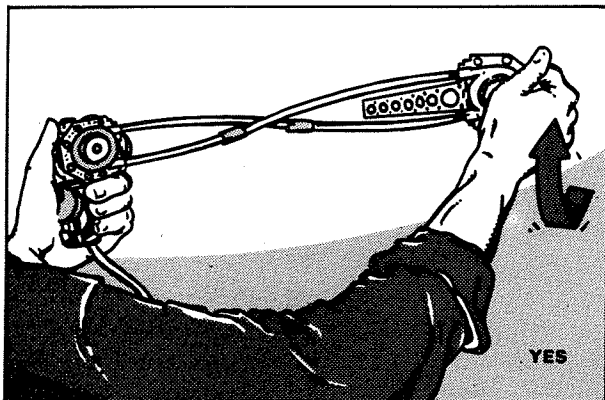
If a standard is not available for your car, gear H = 37 should be used after cutting it to match regulator.

## SECURE SECONDARY ADAPTOR TO THE TRANSMISSION WITH CIRCLIP



(Circlip included in KIT No. 1)

## INSTALLATION OF THE ELECTRIC POWER WINDOW MECHANISM INTO THE DOOR

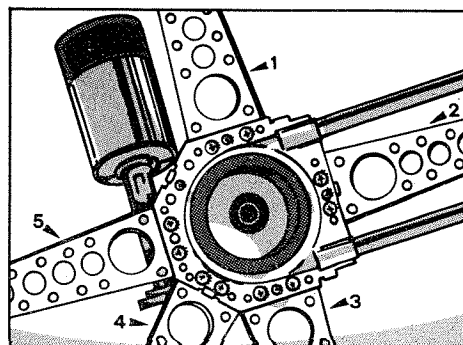
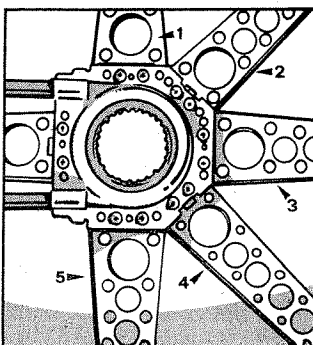
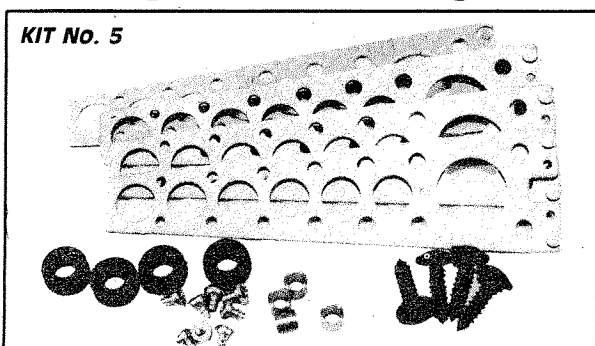


A) Anti-crush Spacers

B) Spacers placed in the wrong position.

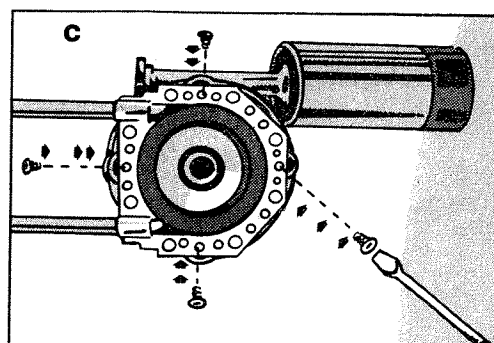
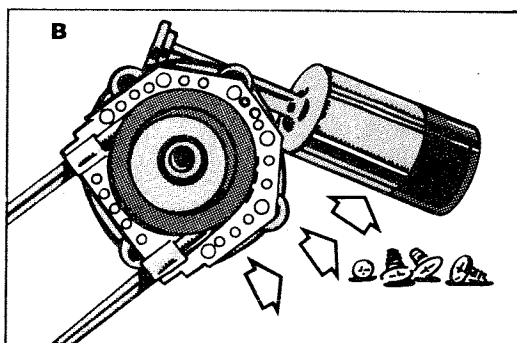
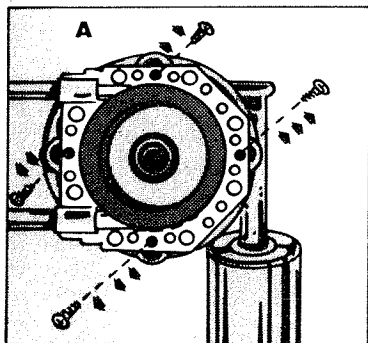
C) Spacers placed in the right position.

## Fixing or shifting of transmission bracket.





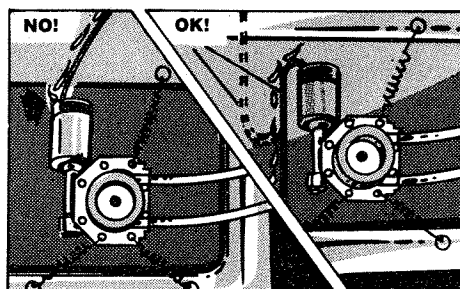
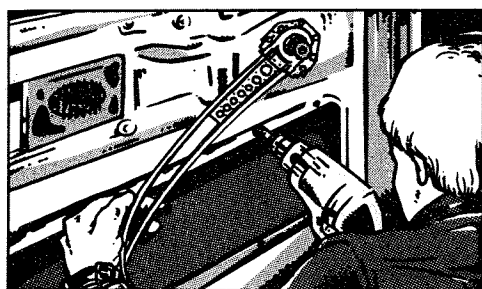
## Motor may be rotated on transmission in order to ensure ease of installation



- A) Remove the screws.
- B) Rotate the motor to the required position.
- C) Retighten the screws in their seats.

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## FASTENING OF GEARED MOTOR WITH SPRINGS

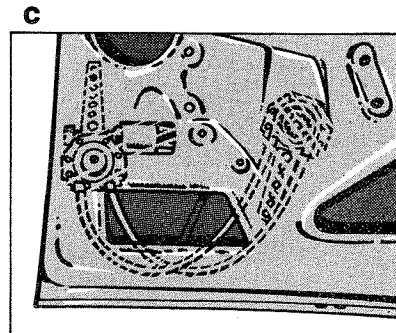
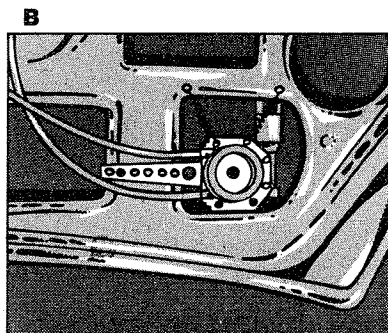
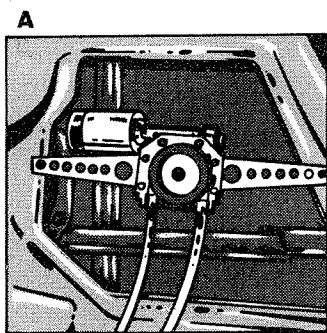
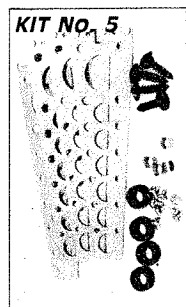


Drill door panel to hook-up springs.

### IMPORTANT:

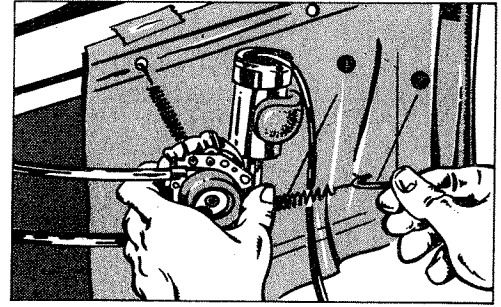
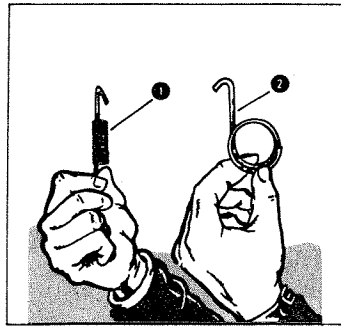
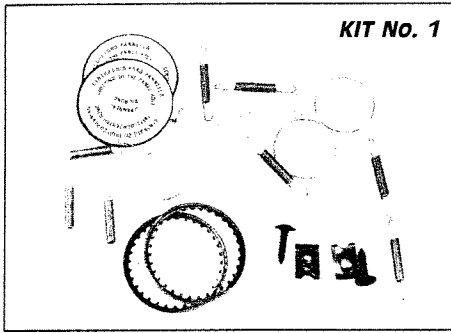
The motor wires must always be positioned downwards.

## Fastening of geared motor with brackets



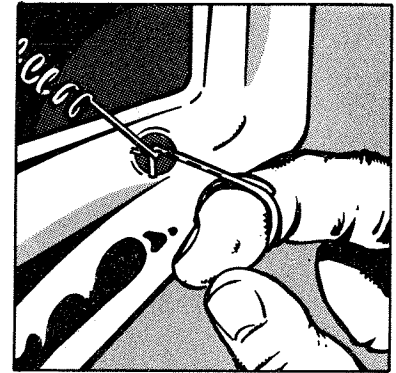
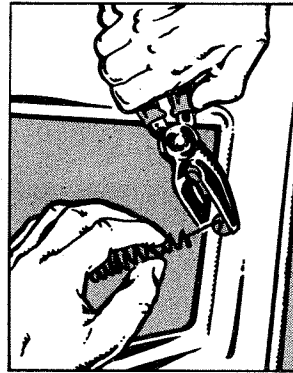
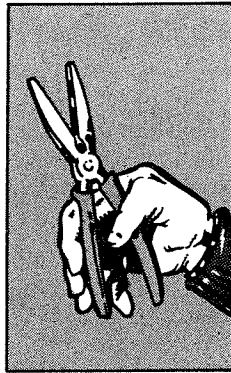
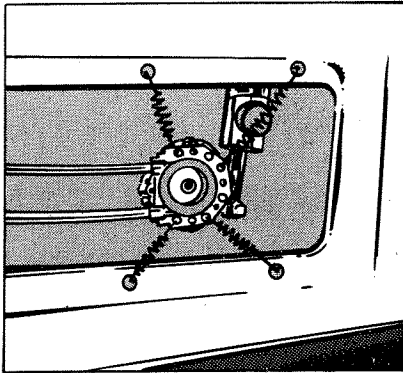
- A) Fastening with two brackets.
- B) Fastening with brackets and springs.
- C) Fasten geared motor behind door panel with one bracket.

# Fastening of geared motor with springs



Take springs and wire clip out of KIT No. 1.

- 1) Spring.
- 2) Wire clip.

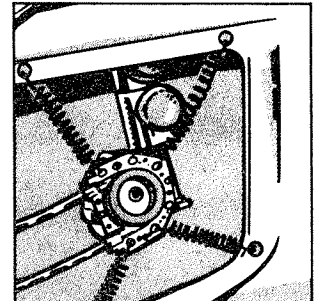
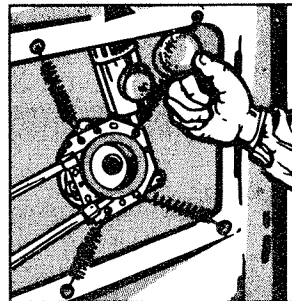
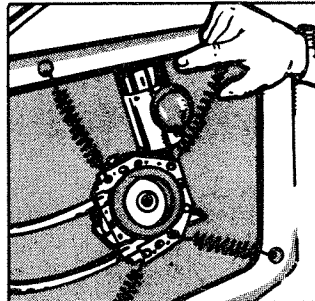
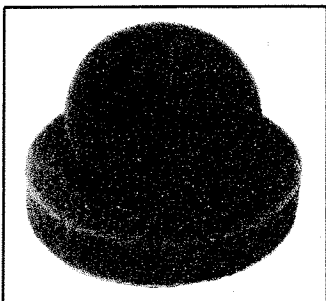


Hook up springs and lock hooks.

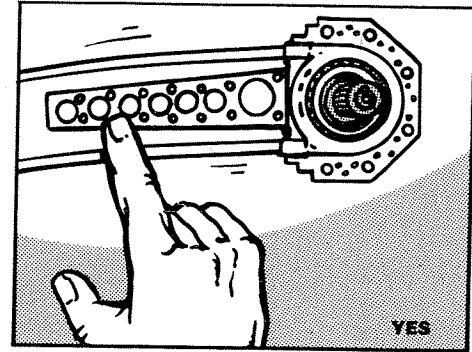
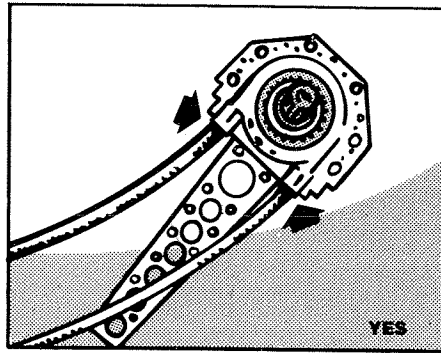
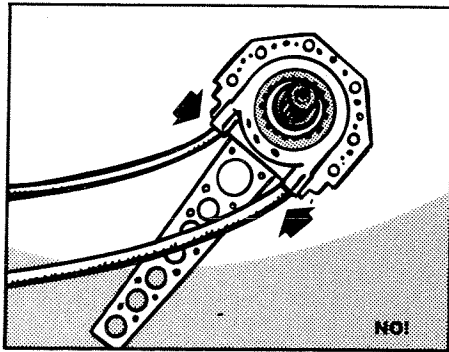
11

## APPLY PADDING TO THE MOTOR

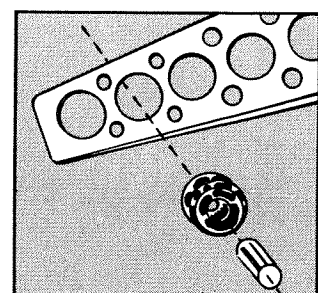
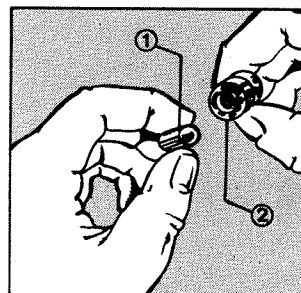
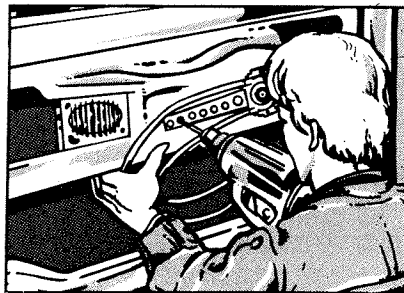
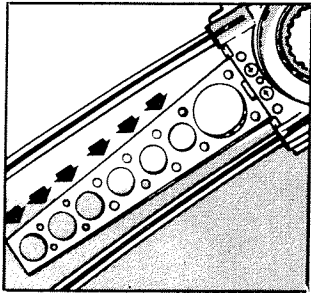
IN CASE THE MOTOR OR PARTS OF IT ARE IN DIRECT CONTACT WITH ANY METAL PARTS, THE SUPPLIED PADDING SHOULD BE USED AS SHOWN BELOW.



# POSITION AND MOUNT BRACKET



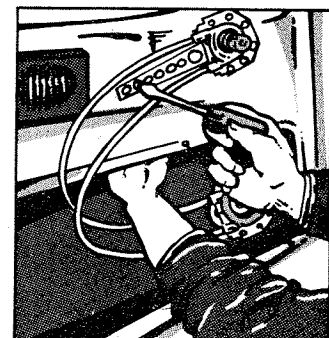
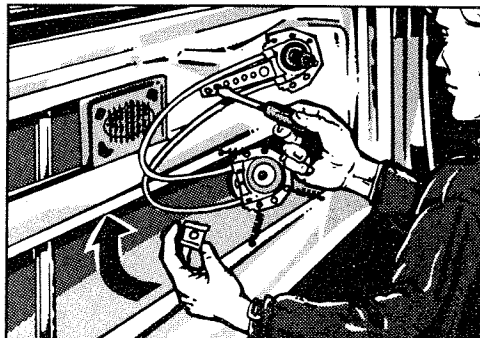
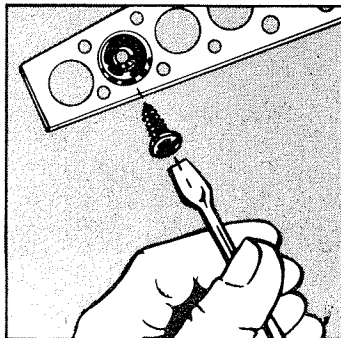
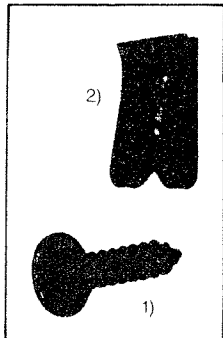
Position and mount the bracket without forcing the transmission.



Mount bracket through one of the holes (Use the outer ones, where possible).

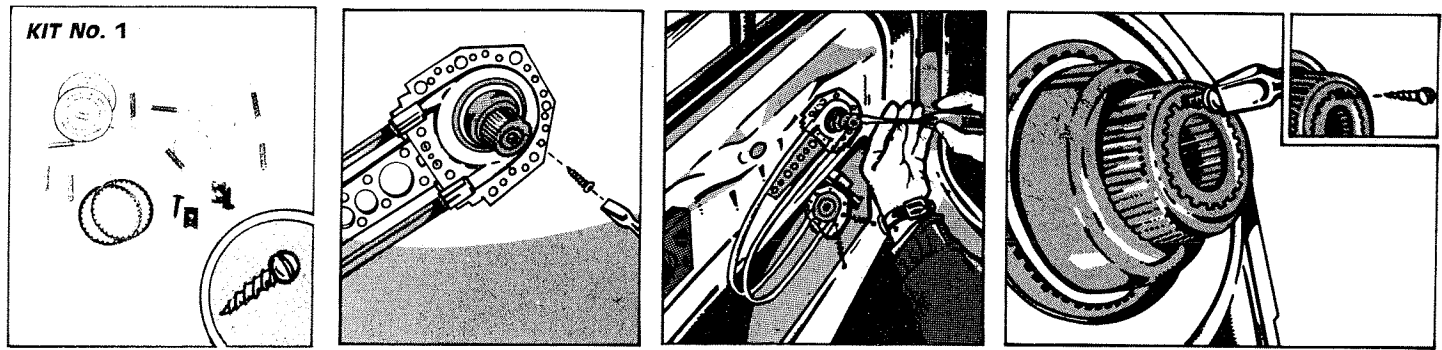
- 1) Internal metal bushing
- 2) External rubber bushing

Drill 7/64" holes to fasten bracket.



- 1) Screw
- 2) Speed clip.

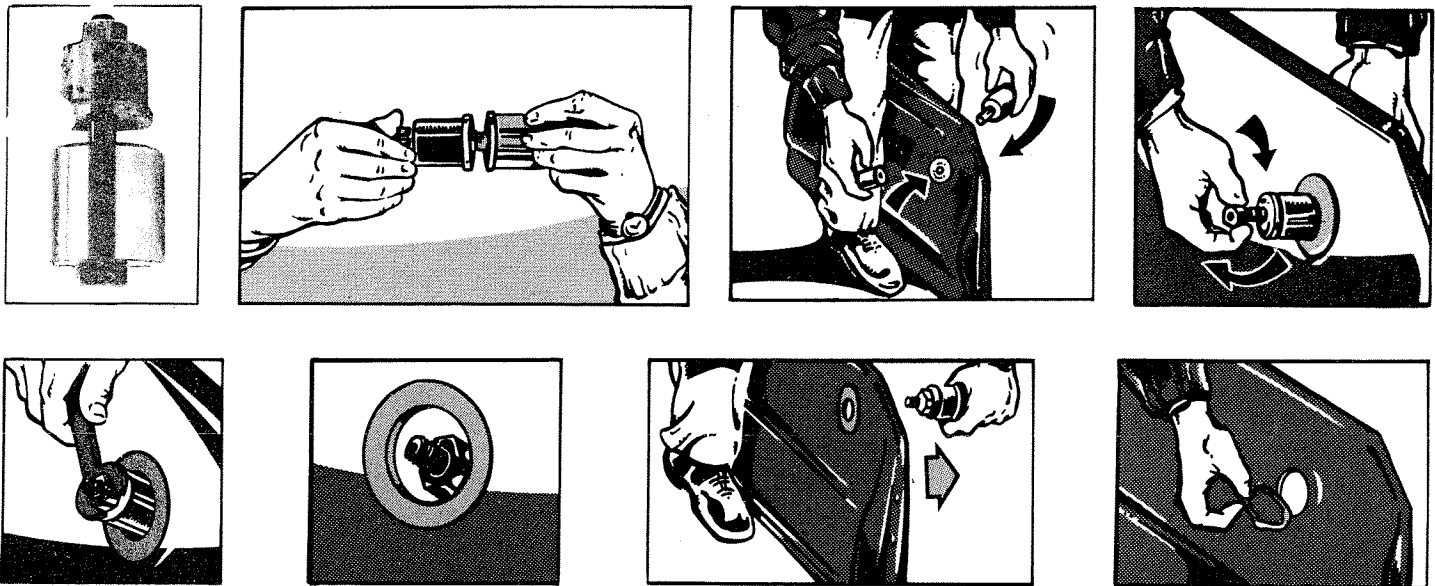
# LOCK PRIMARY ADAPTOR AND SECONDARY ADAPTOR



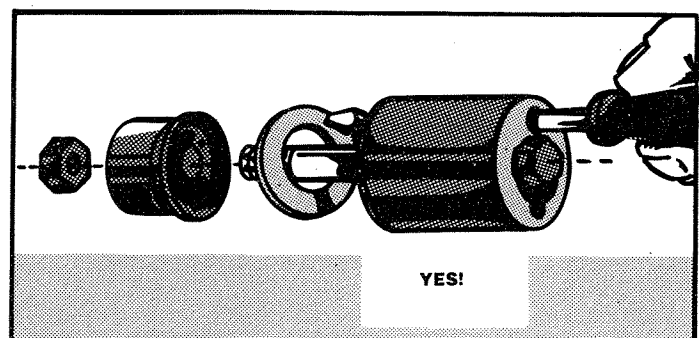
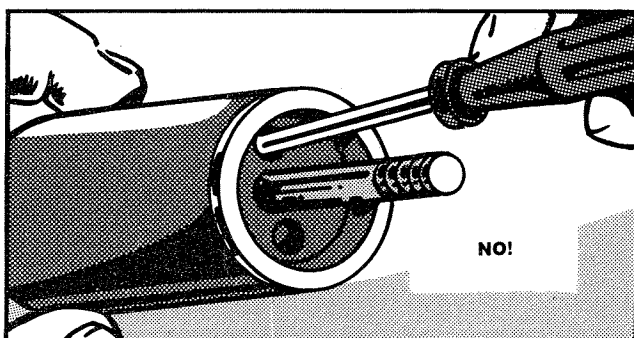
Insert the screw in the space between the adaptor and the gear sleeve.

# CUT DOOR PANEL WITH DOOR PANEL CUTTER

DOOR PANEL CUTTER TOOL SUPPLIED UPON REQUEST

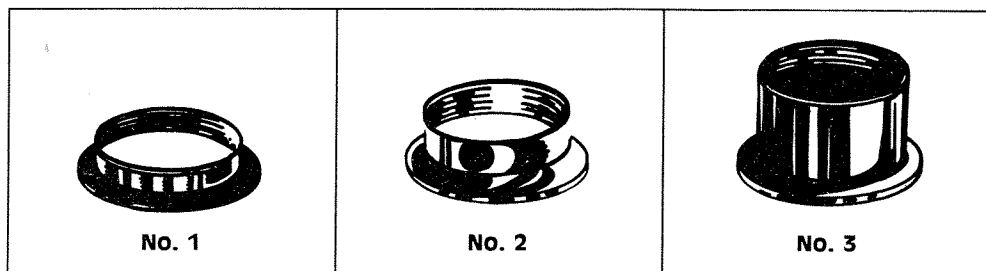
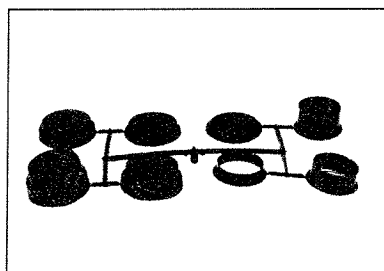


Center the cutter with the adhesive - Tighten with a wrench until the cutter comes free. Remove any remaining adhesive.



To clean out the cutter, do as shown above.

# SECURE GROMMET WITH RETAINER RING

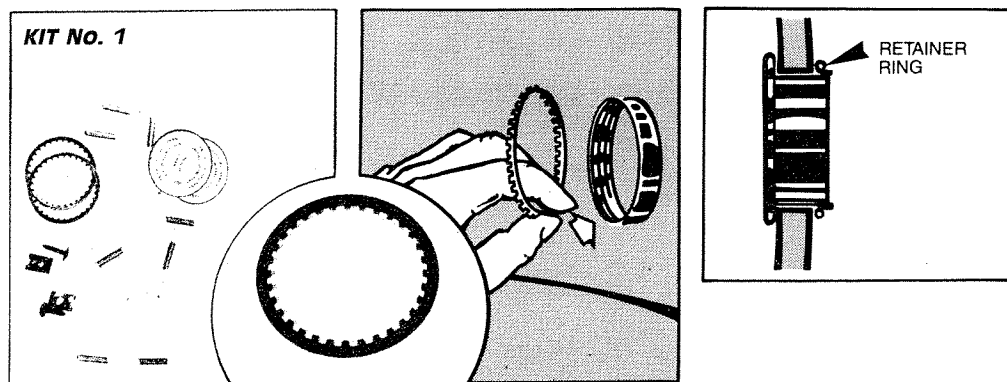


**No. 1** - Small.

**No. 2** - Medium.

**No. 3** - Large.

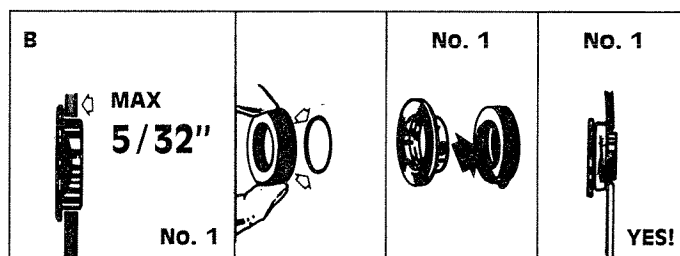
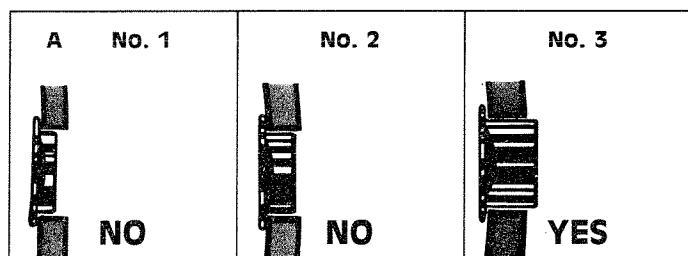
## The grommet locks to panel by means of a retainer ring



The grommet has to come through the door casing at least  $5/32''$  in order to be locked with the retainer ring.

To choose the proper grommet, follow this procedure:

— Insert grommet no. 1 (SMALL) into the panel, if it does not come through, try no. 2 (MEDIUM) and then, if necessary, no. 3 (LARGE).

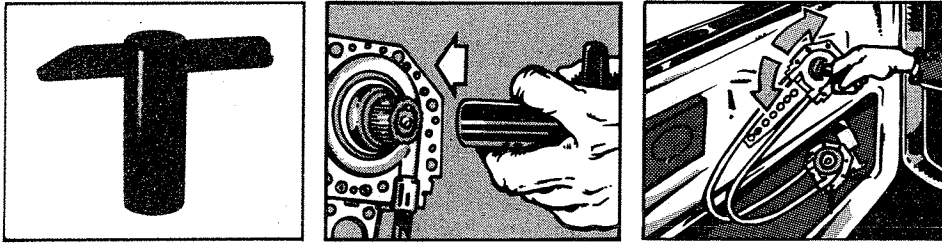


**A)** No. 1 - SMALL (wrong: too short).  
 No. 2 - MEDIUM (wrong: too short).  
 No. 3 - LARGE (yes).

**B)** If the door panel is less than  $5/32''$  thick a perfect fit between cap and grommet can be obtained by inserting a sponge from the rear of the door casing.

# EMERGENCY HANDLE

FOR ELECTRIC WINDOWS WITH CLUTCH - ART. 33000011



Check function of the emergency handle.

**NOTE:** This Kit includes the handle in case the electrical system of the vehicle should malfunction. If used with anti theft devices or centralized locking systems, use SPAL Electronic module M1-Art. 33040006.

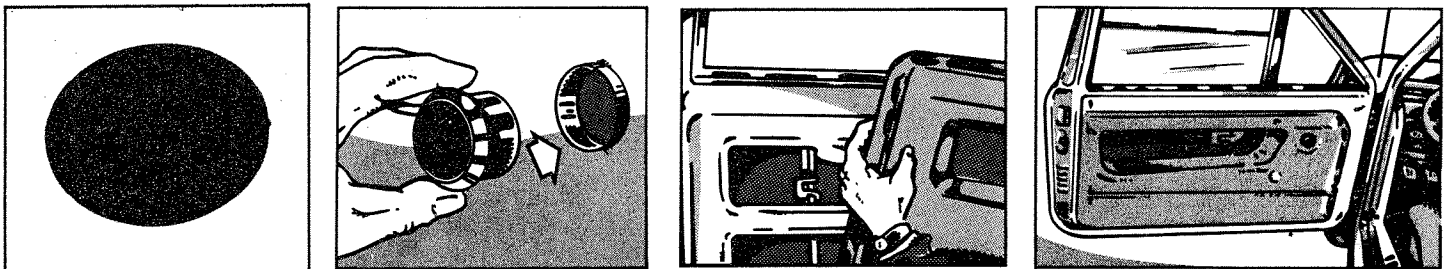
# UNIVERSAL ELECTRIC WINDOWS WITHOUT CLUTCH

ART. 33000013

## NOTE:

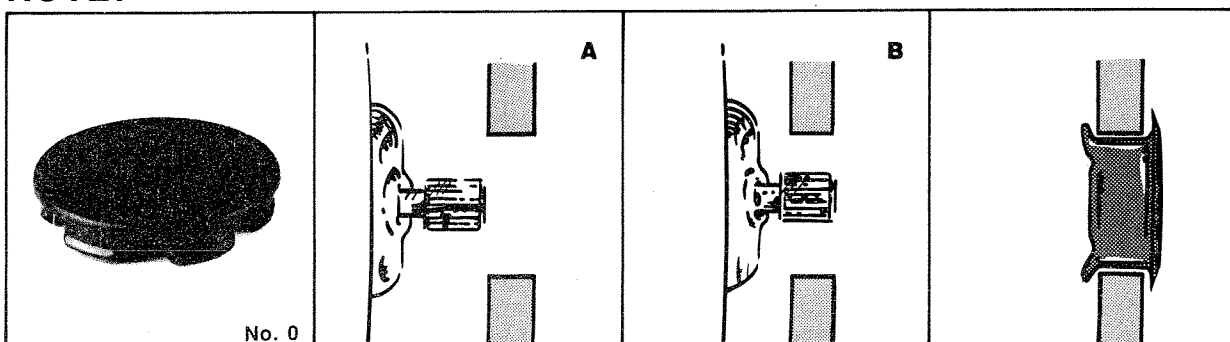
- This Kit does not contain the emergency handle because the electric window is not equipped with clutch.
- If combined with anti theft devices or centralized door Locking systems, use SPAL Electronic Module M1 Art. 33040006, or our SPAL Electronic Module M2 Art. 33040021 or any other TIMED anti theft devices.

# FIT FINISHING CAP ON DOOR PANEL



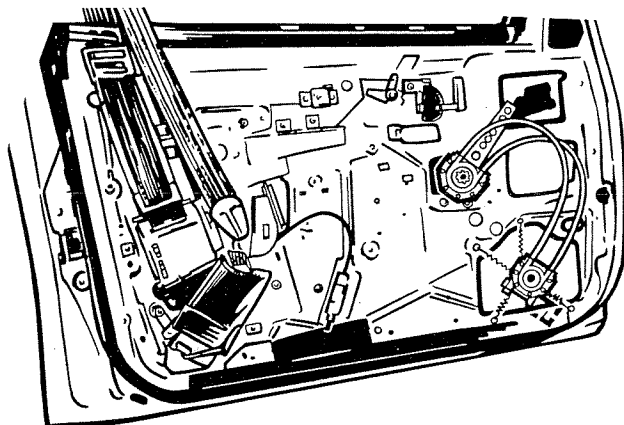
Fit the Cap on the grommet and fit the panel on the door.

## NOTE!



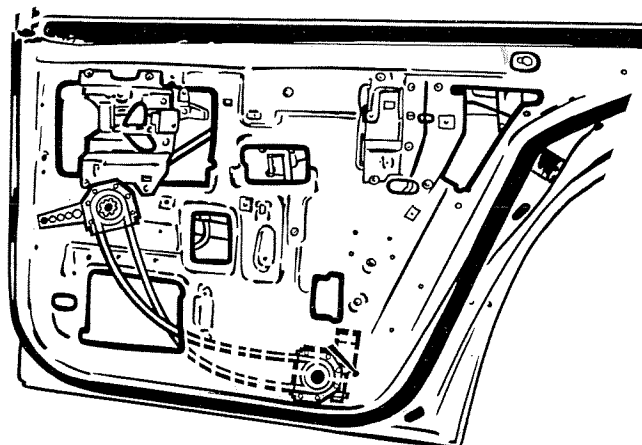
When the regulator pivot does not come out from the panel (photo **A** and **B**) you can use cap No. 0 for a better appearance.

# INSTALLATION EXAMPLE FOR ELECTRIC POWER WINDOWS IN SOME OF THE PRIMARY CARS IN THE U.S.



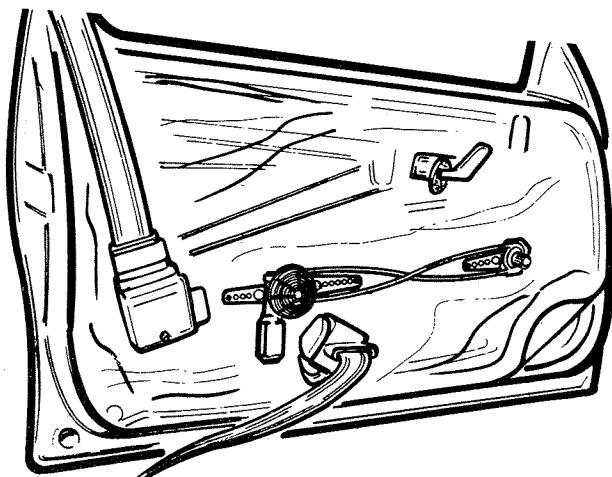
## BUICK CENTURY (4 Doors) front left

- insert gear H 15 (insert from red marked side)
- adaptor No. 8
- turn transmission side of geared motor towards inside of car
- affix geared motor with springs
- grommet No. 1
- cap No. 1



## BUICK CENTURY (4 Doors) rear right

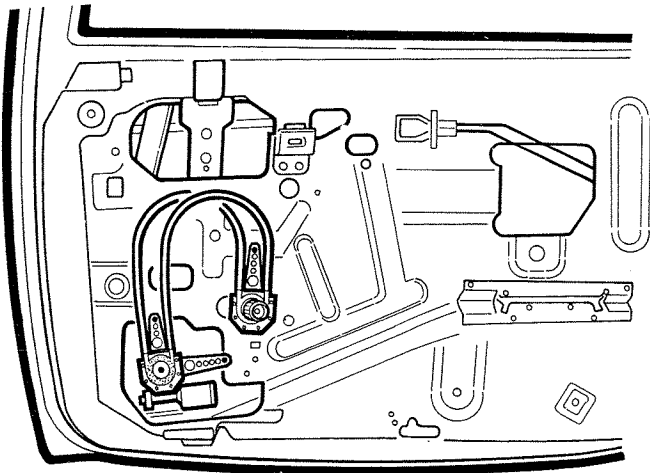
- adjust bracket on transmission shortened 1"
- insert gear H 15 (insert from red marked side)
- adaptor No. 8
- turn transmission side of geared motor towards inside of car
- affix geared motor with plastic fastener
- grommet No. 1
- cap No. 1



## BUICK SKYLARK GS (2 Doors-mod. '92) front left

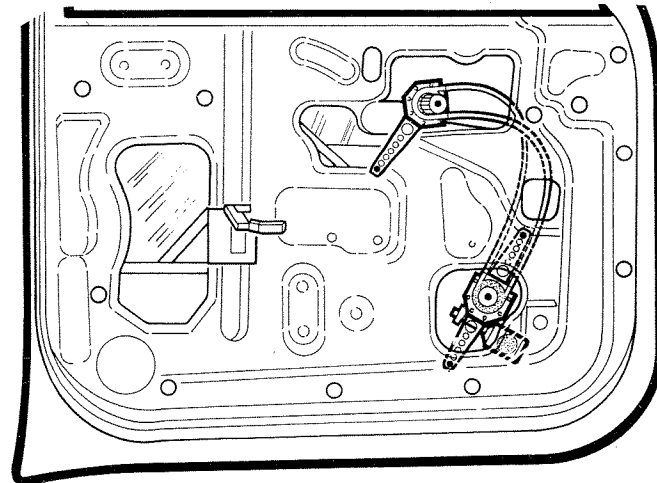
- shorten bracket on transmission 1"
- insert gear H 37 (insert from opposite side to red marked side)
- adaptor No. 8
- grill side of geared motor towards inside of car
- fasten geared motor with two brackets after having shortened one off 1"
- grommet No. 2
- cap No. 2

\* for quicker installation, the nylon protection should not be removed



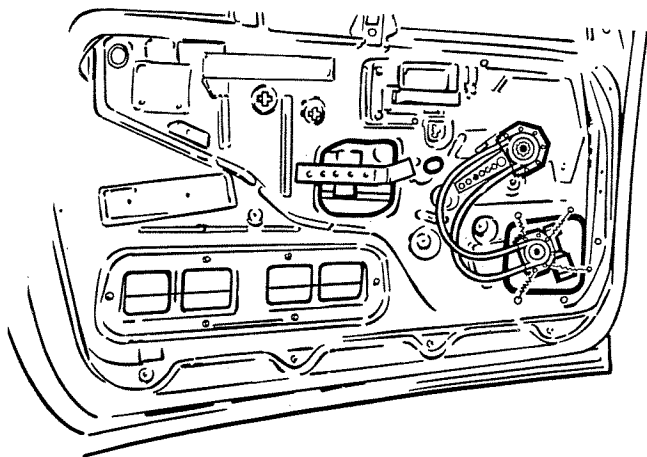
### CHEVROLET MALIBU front left

- shift bracket on transmission
- gear H 37 (insert from red marked side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly formed
- grommet No. 1
- cap No. 1



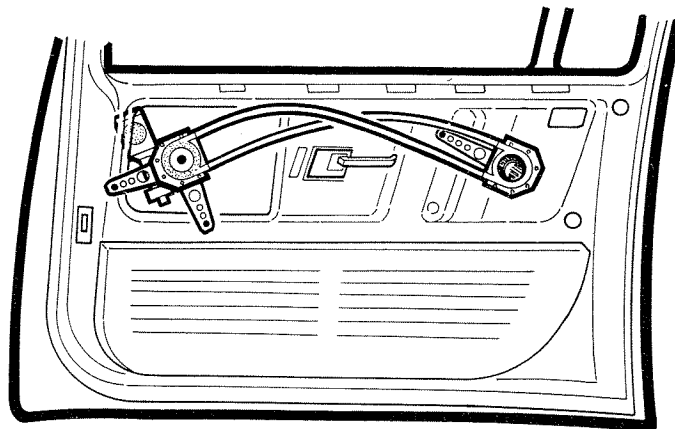
### CHEVROLET CAMARO mod. '91 front right

- insert gear H 25 mm. (insert from red marked side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut and formed
- grommet No. 1
- cap No. 2



### CHEVROLET FULL SIZE mod. '88 front left

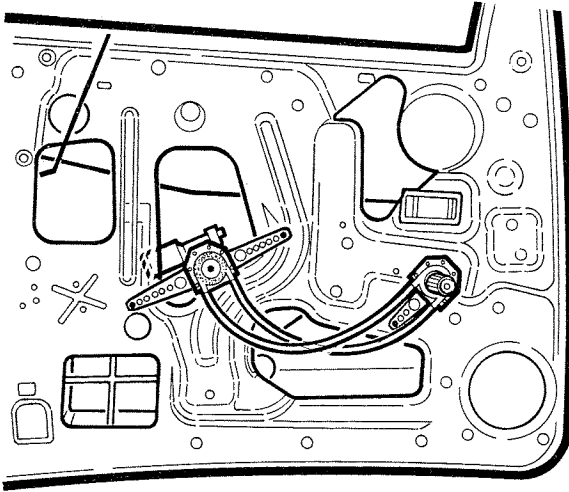
- insert gear H 15 (insert from red market side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- affix gered motor with springs
- grommet No. 1
- cap No. 1



### CHEVROLET PLU front right

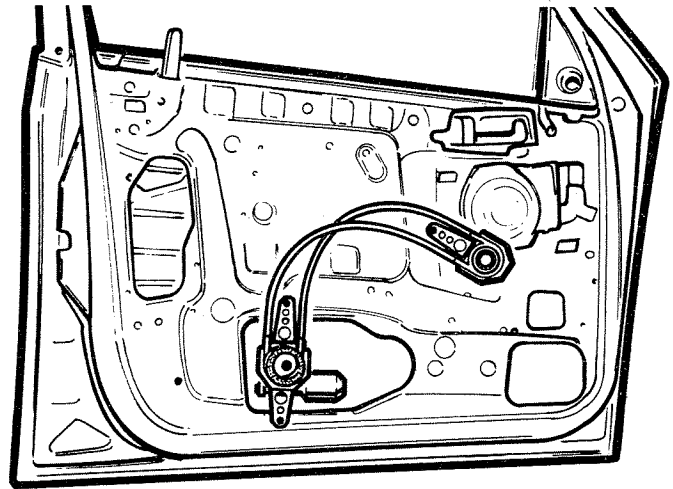
- gear H 37 (insert from red marked side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut
- grommet No. 2
- cap No. 2





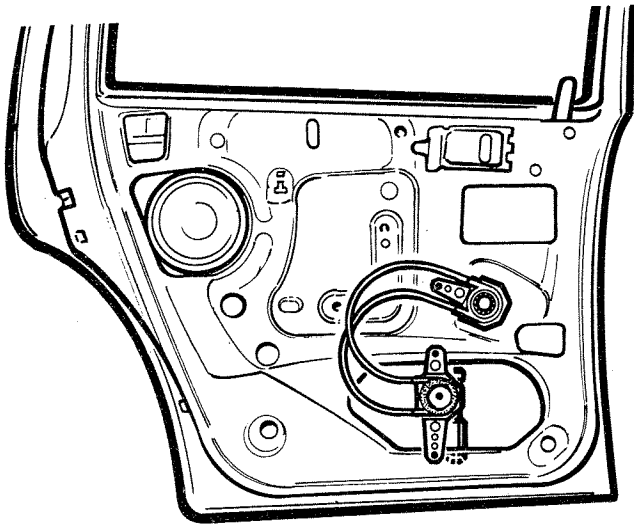
**DODGE DAKOTA mod. '91 front left**

- shorten bracket on transmission 1.6"
- insert gear H 37 (insert from red marked side)
- adaptor No. 13
- apply paddings on gered motor
- turn transmission side of gered motor towards inside of car
- affix gered motor with two brackets
- grommet No. 1
- cap No. 2



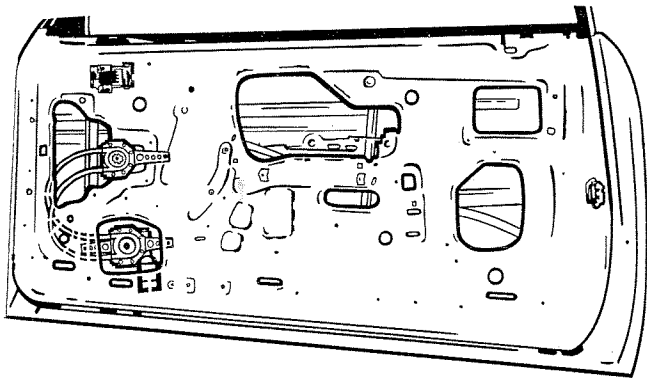
**DODGE SPIRIT (4 Doors-mod. '91) front left**

- shorten bracket on transmission 1.6"
- gear H 15 (insert from red marked side)
- adaptor No. 13
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut and formed
- grommet No. 2
- cap No. 2



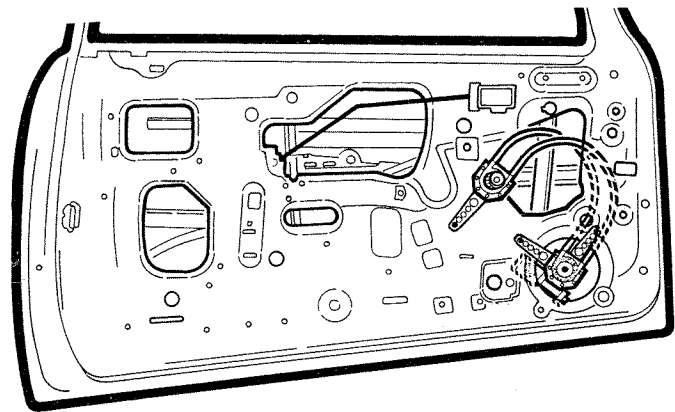
**DODGE SPIRIT mod. '91 rear left**

- shorten braket on transmission 2.2"
- gear H 25 (insert from red marked side)
- adaptor No. 13
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut and formed
- grommet No. 2
- cap No. 2



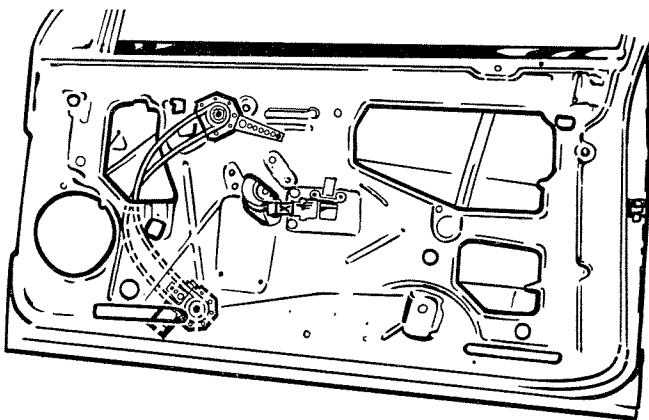
### FORD MUSTANG front right

- adjust bracket on transmission
- insert gear H 15 (insert from red marked side)
- adaptor No. 12
- apply paddings to gered motor
- turn transmission side of gered motor towards inside of car
- affix gered motor with two brackets
- grommet No. 1
- cap No. 1



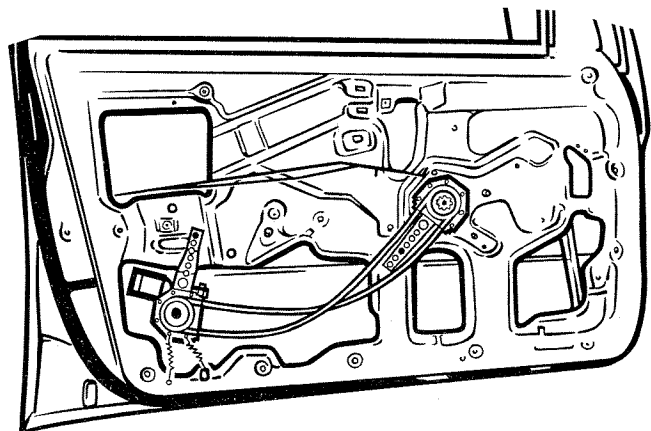
### FORD MUSTANG mod. '91 front left

- shorten bracket on transmission 1"
- insert gear H 15 (insert from red marked side)
- adaptor No. 12
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut and formed
- grommet No. 1
- cap No. 2



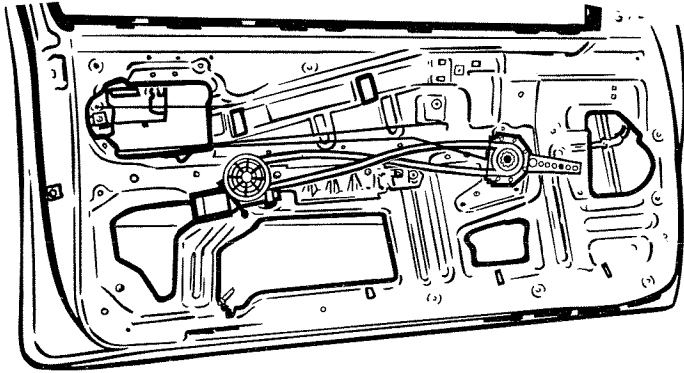
### FORD TEMPO front right

- adjust bracket on transmission
- rotate gered motor 180° on transmission
- insert gear H 15 (insert from red marked side)
- adaptor No. 12
- apply paddings to gered motor
- turn transmission side of gered motor toward inside of car
- affix gered motor with bracket shortened 2.2"
- grommet No. 1
- cap No. 1



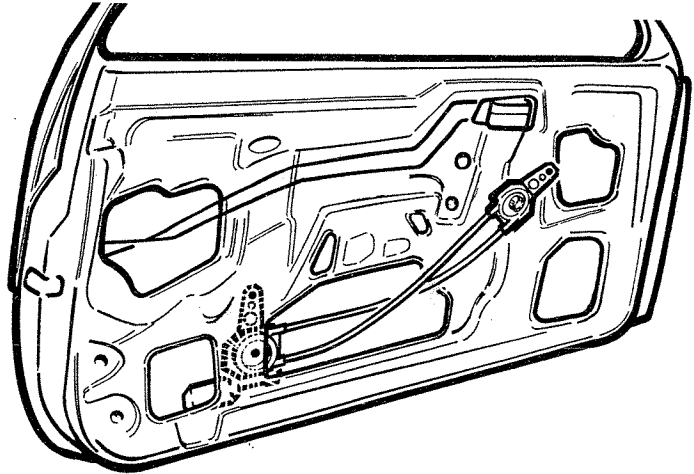
### GEO METRO (4 Doors) front left

- rotate gered motor 90° on transmission
- insert gear H 15 (insert from red marked side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- affix gered motor with springs and brackets (bend appropriately)
- grommet No. 1
- cap No. 1



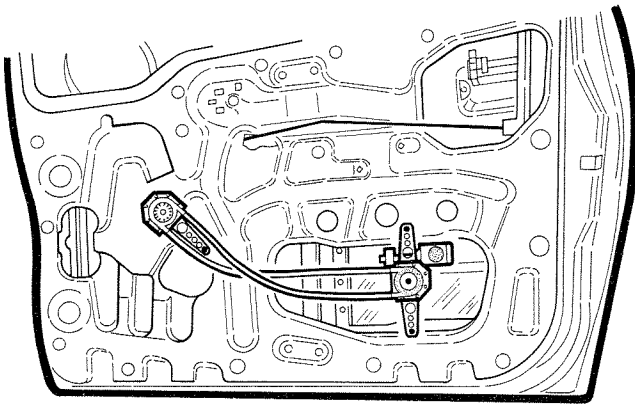
### GEO METRO GTI front right

- shift bracket on transmission
- rotate geared motor 90° on transmission
- insert gear H 37 (insert from opposite side of red marked side)
- adaptor No. 8
- apply paddings to geared motor
- turn grill side of geared motor towards inside of car
- affix geared motor with plastic fastener
- grommet No. 1
- cap No. 1



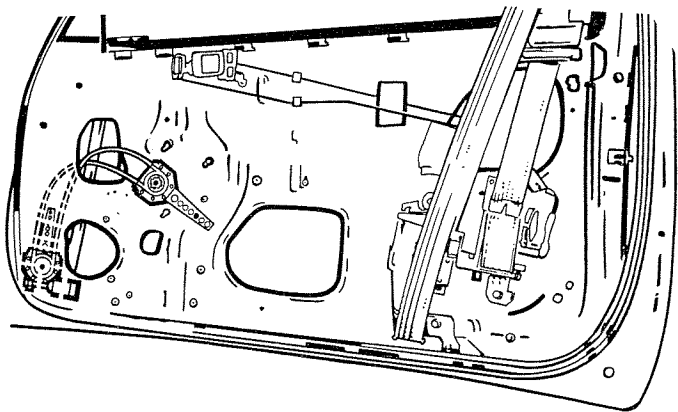
### GEO STORM mod. '90 front left

- shift bracket on transmission and shorten 2.2"
- rotate geared motor 90° on transmission
- insert gear H 15 (insert from red marked side)
- adaptor No. 11
- affix geared motor with bracket shortened 1.6"
- grommet No. 1
- cap No. 1



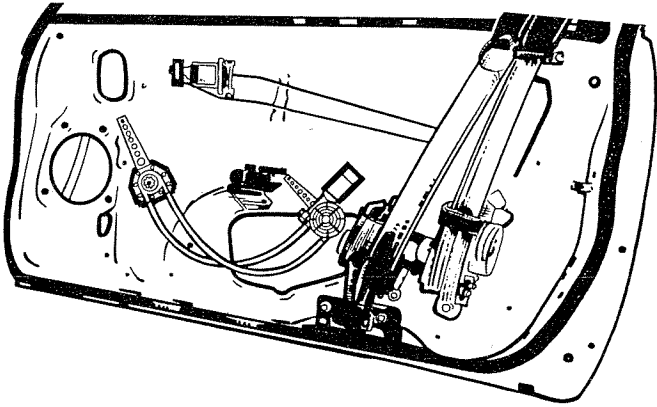
### GEO TRACKER front right

- rotate geared motor 90° on transmission
- gear H 15 (insert from red marked side)
- adaptor No. 8
- turn transmission side of geared motor towards inside of car
- fasten geared motor with two brackets properly cut
- grommet No. 1
- cap No. 1



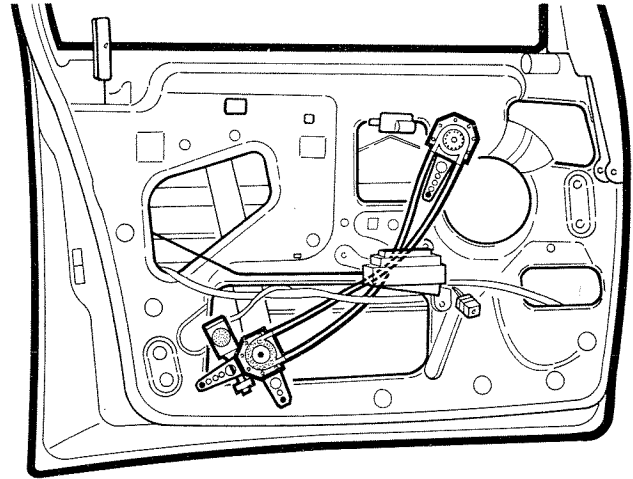
### HONDA ACCORD front right

- adjust bracket on transmission
- insert gear H 15 (insert from red marked side)
- adaptor No. 9
- apply paddings to geared motor
- turn transmission side of geared motor towards inside of car
- affix geared motor with plastic fastener
- grommet No. 1
- cap No. 2
- \* Bend door panel in area where cables cross. Affix cables to door panel with plastic fastener.
- \* Care should be taken to not damage the geared motor with door stopper.



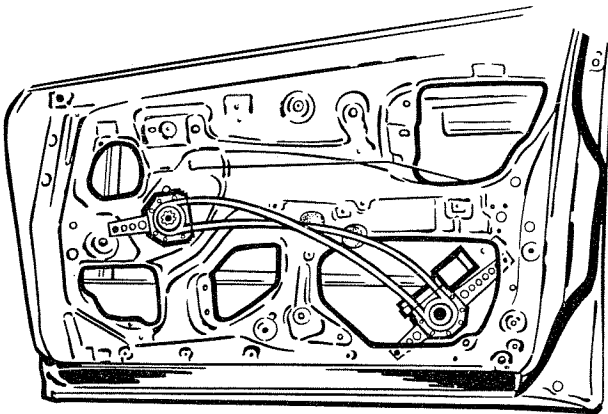
### HONDA CIVIC CRX front right

- adjust bracket on transmission
- rotate gered motor 90° on transmission
- insert gear H 15 (insert from red marked side)
- adaptor No. 9
- apply paddings to grill of gered motor
- turn transmission side of gered motor towards inside of car
- affix gered motor with brackets (affix support arm screw)
- grommet No. 1
- cap No. 1



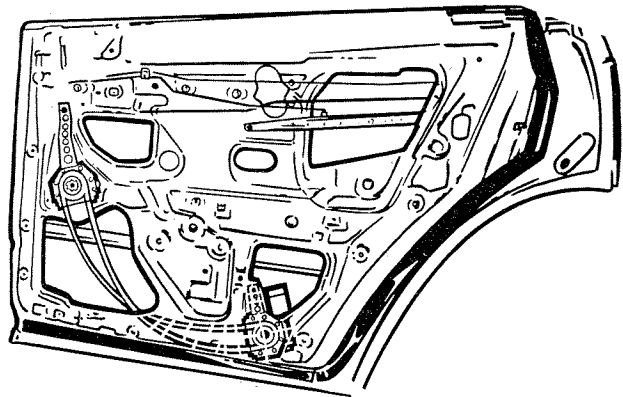
### ISUZU RODEO front left

- gear H 25 (insert from red marked side)
- adaptor No. 13
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut and formed
- grommet No. 1
- cap No. 1



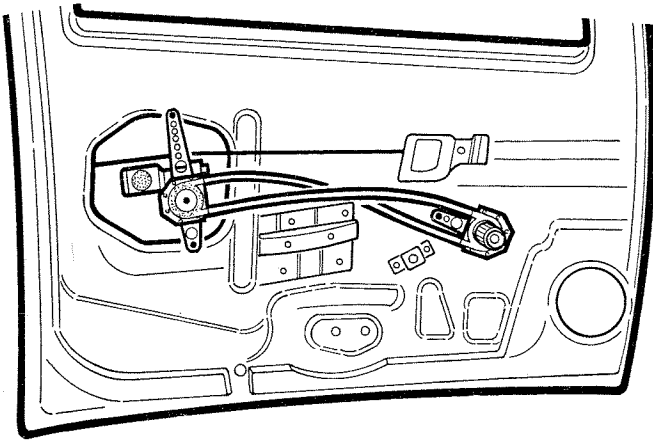
### MAZDA 626 4 Doors (U.S.) mod. '90 front right

- adjust bracket on transmission shortened 1"
- rotate gered motor 90° on transmission
- insert gear H 15 (insert from red marked side)
- adaptor No. 10
- turn transmission side of gered motor towards inside of car
- affix gered motor with two brackets after having shortened one off 1"
- grommet No. 1
- cap No. 1



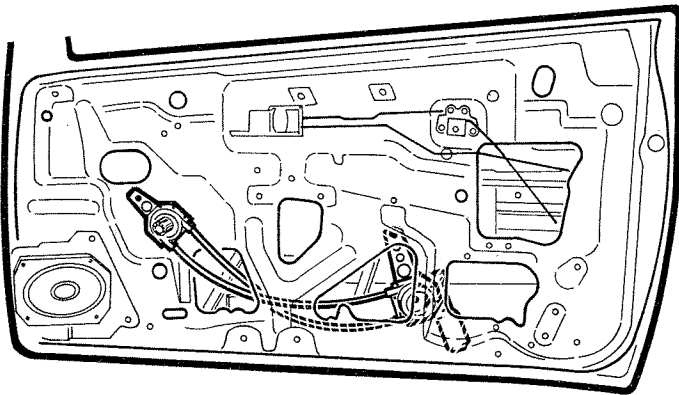
### MAZDA 626 4 Doors (U.S.) mod. '90 rear right

- adjust bracket on transmission and bend appropriately
- insert gear H 15 (insert from red marked side)
- adaptor No. 10
- apply paddings to gered motor
- turn transmission side of gered motor towards inside of car
- affix gered motor with brackets shortened 1"
- grommet No. 1
- cap No. 1



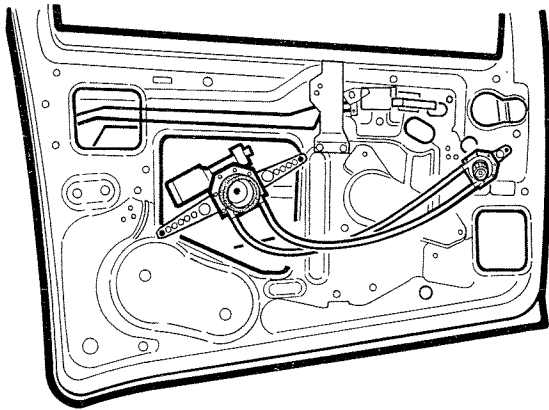
**MITSUBISHI ECLIPSE mod. '91 front left**

- shorten bracket on transmission 2.2"
- rotate gered motor 90° against transmission
- insert gear H 37 (insert from red marked side)
- adaptor No. 1
- transmission side of gered motor towards inside of car
- fasten gered motor with two brackets after having shortened one off 2.5"
- grommet No. 1
- cap No. 3



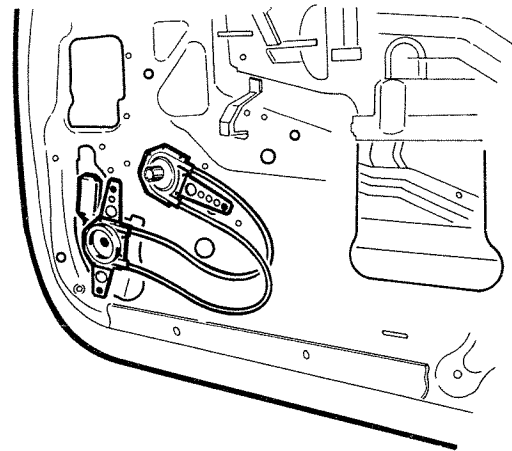
**NISSAN 240SX mod. '91 front right**

- shift bracket on transmission and shorten 2.2"
- insert gear H 25 (insert from red marked side)
- adaptor No. 1
- turn transmission side of gered motor towards inside of car
- affix gered motor with bracket
- grommet No. 3
- cap No. 1



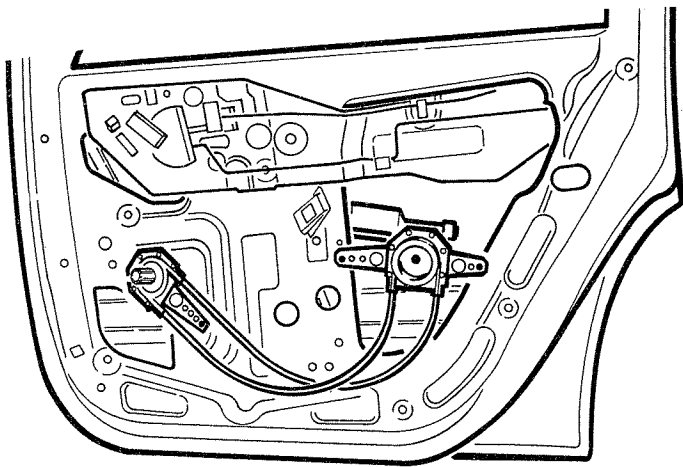
**OLDSMOBILE CALAIS mod. '91 front left**

- insert gear H 37 (insert from red marked side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut
- grommet No. 1
- cap No. 3



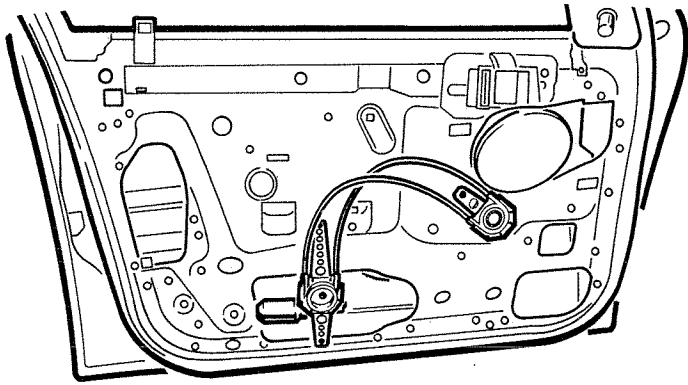
**OLDSMOBILE CUTLASS SUPREME mod. '91 (4 Doors) front rihgt**

- shift bracket on transmission
- insert gear H 25 (insert from red marked side)
- adaptor No. 1
- turn transmission side of gered motor towards inside of car
- affix gered motor with bracket
- grommet No. 1
- cap No. 1



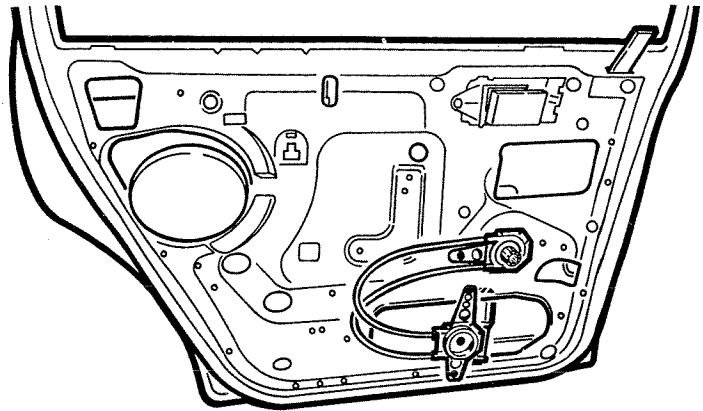
**OLDSMOBILE CUTLASS SUPREME mod. '91 rear right**

- insert gear H 37 (insert from red market side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut
- grommet No. 2
- cap No. 2



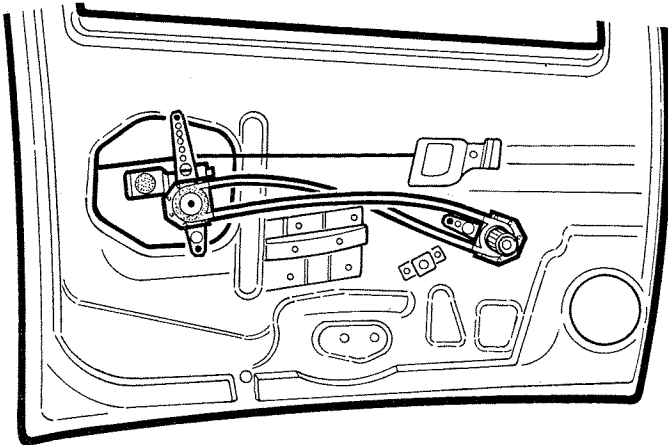
### PLYMOUTH ACCLAIM '91 front left

- cut 2.2" off pre-mounted bracket on transmission and add a new one
- insert gear H 15 (insert from red marked side)
- adaptor No. 13
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets after shortening them 1.6" off
- grommet No. 1
- cap No. 1



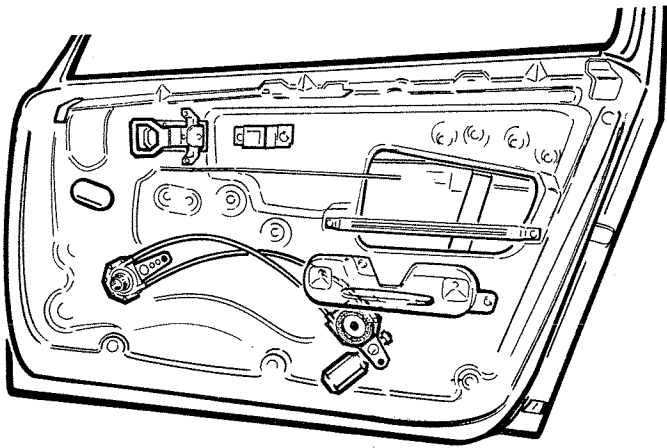
### PLYMOUTH ACCLAIM rear left

- cut 2.5" off pre-mounted bracket on transmission and add a new one
- insert gear H 25 (insert from red marked side)
- adaptor No. 13
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut
- grommet No. 1
- cap No. 1



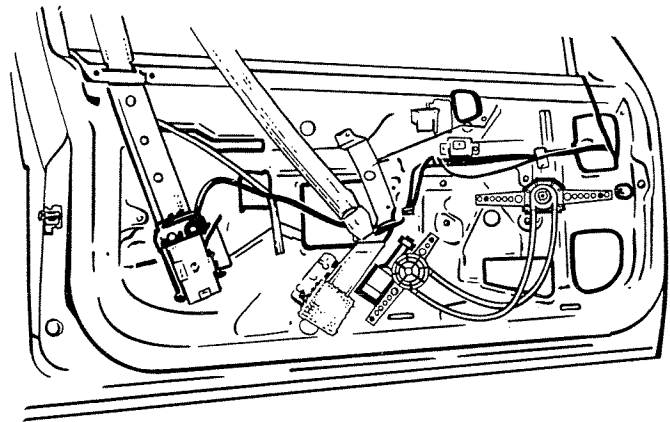
### PLYMOUTH LASER mod. '91 front left

- shorten bracket on transmission 2.2"
- rotate gered motor 90° on transmission
- adaptor No. 1
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets after having shortened one off 2.5"
- grommet No. 1
- cap No. 3



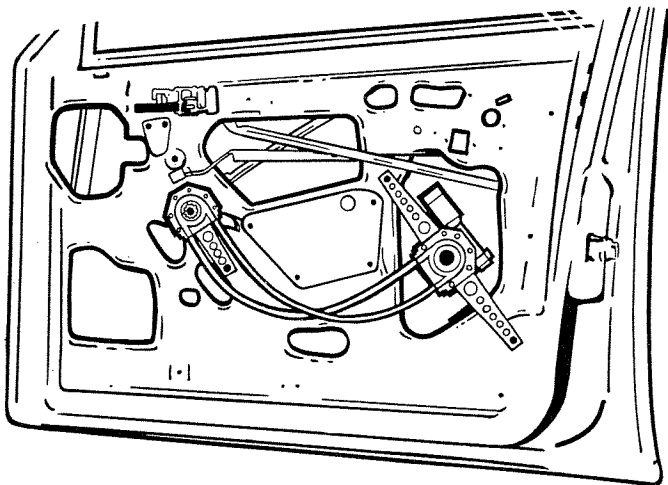
### PONTIAC FIERO mod. '88 front right

- insert gear H 25 mm. (insert from red marked side)
- adaptor No. 8
- turn transmission side of gered motor toward inside of car
- affix gered motor with brackets shortened 2.2"
- grommet No. 2
- cap No. 2



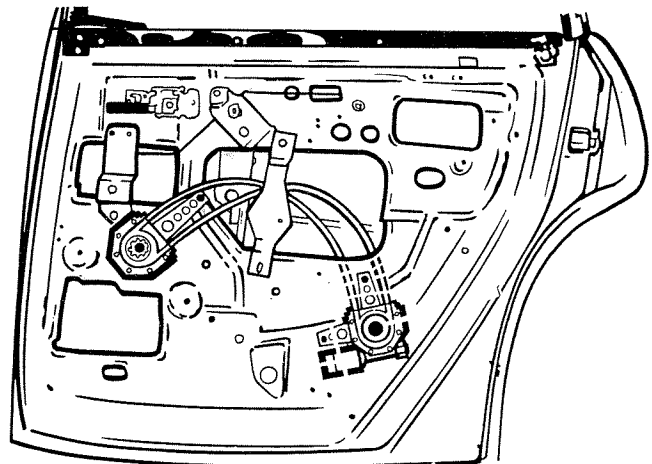
### PONTIAC GRAN PRIX front left

- adjust bracket on transmission and add a new one
- insert gear H 25 (insert from red marked side)
- adaptor No. 8
- apply paddings to gered motor
- turn grull side of gered motor towards inside of car
- affix gered motor with brackets shortened 2.2"
- grommet No. 1
- cap No. 1



### PONTIAC 6000 front right

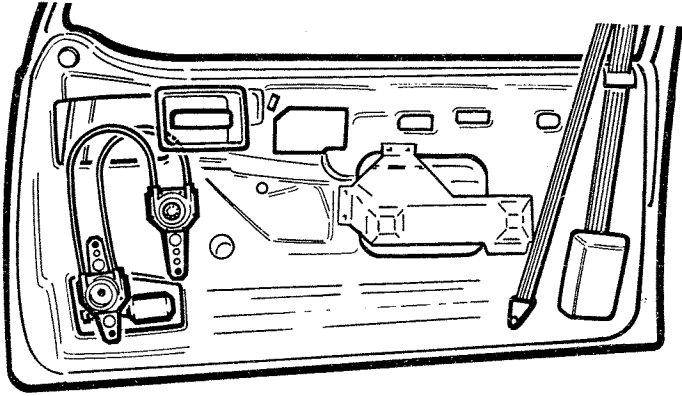
- insert gear H 37 (insert from red market side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- affix gered motor with two brackets
- grommet No. 1
- cap No. 1



### PONTIAC 6000 rear right

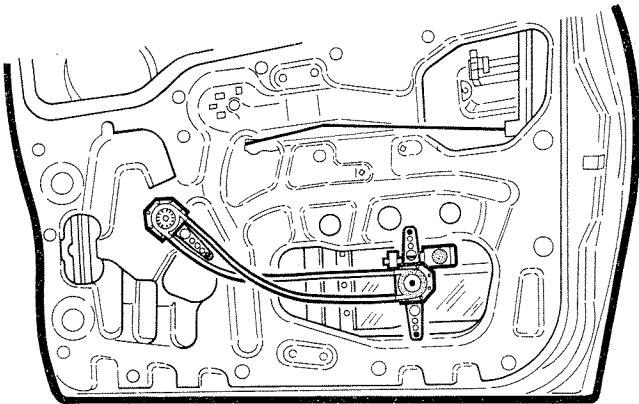
- shorten bracket on transmission 6"
- insert gear H 15 (insert from red marked side)
- adaptor No. 8
- apply paddings to gered motor
- turn transmission side of gered motor towards inside of car
- affix gered motor with two brackets shortened 2.2"
- grommet No. 1
- cap No. 1





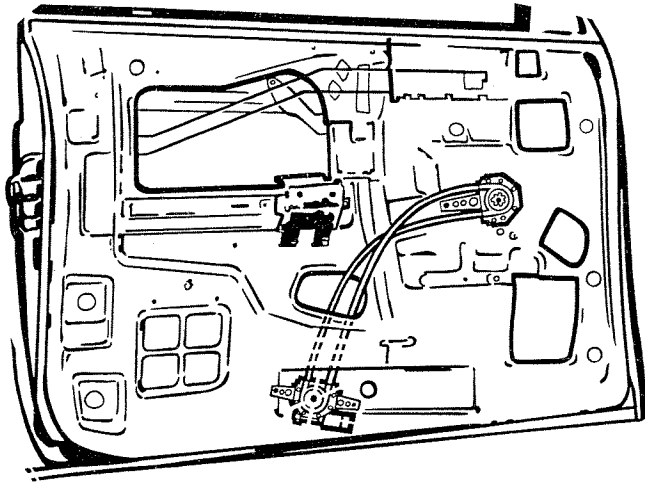
**PONTIAC SUNBIRD mod. '91 front left**

- shift bracket on transmission and shorten 1.6''
- insert gear H 15 (insert from red marked side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut and formed
- grommet No. 2
- cap No. 1



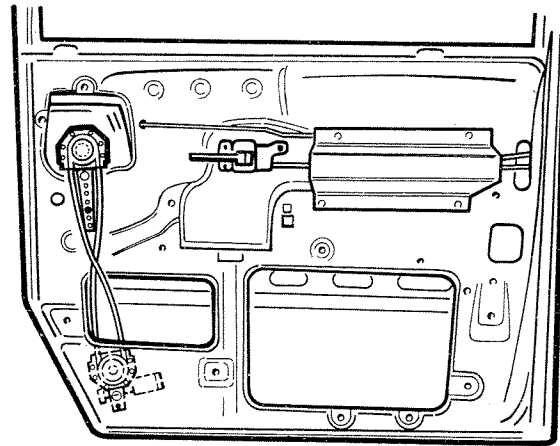
**SUZUKI SIDERICK front right**

- rotate gered motor 90° on transmission
- gear H 15 (insert from red market side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut
- grommet No. 1
- cap No. 1



### CHEVROLET/GMC S-10/15 PICKUP front left

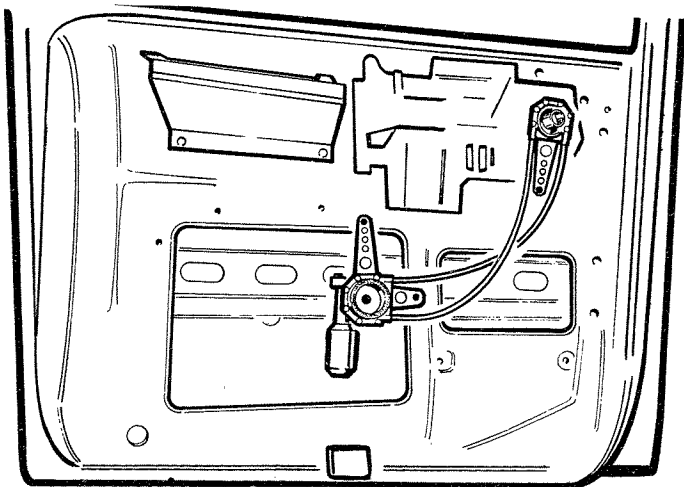
- shorten bracket on transmission 1.6"
- gear H 15 (insert from red marked side)
- adaptor No. 8
- apply paddings to gered motor
- turn transmission side of gered motor towards inside of car
- affix gered motor with two brackets
- grommet No. 1 (may need to use with 2.9" plastic round washer)
- cap No. 1



### CHEVROLET/GMC ASTRO VAN front right

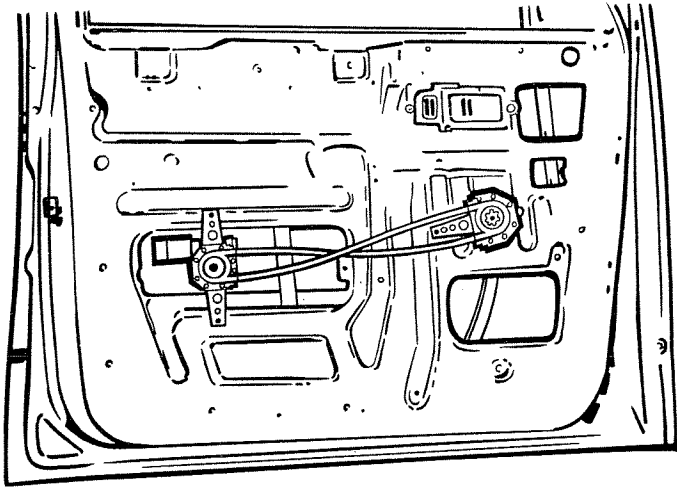
- insert gear H 37 (insert from red marked side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- affix gered motor with brackets shortened 1.6"
- grommet No. 1
- cap No. 1

Note: To avoid damage to transmission cable, bend door panel as shown in picture.



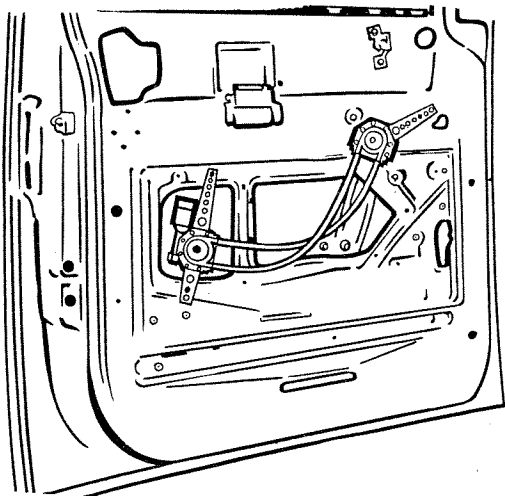
### CHEVROLET/GMC ASTRO VAN mod. '91 front left

- insert gear H 37 (insert from red market side)
- adaptor No. 8
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut
- grommet No. 1
- cap No. 2



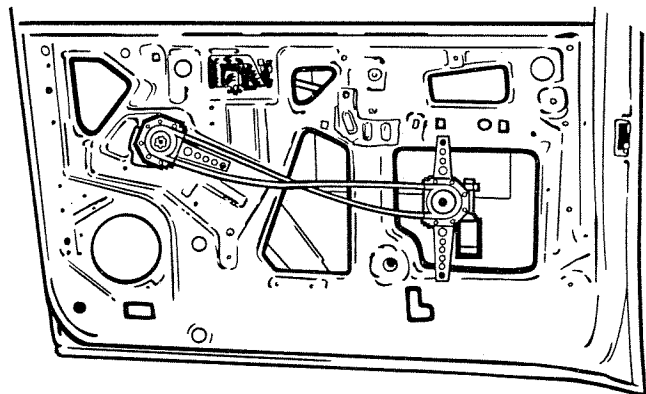
**DODGE CARAVAN front left**  
(Chrysler/Plymouth Voyager)

- shorten bracket on transmission 1.6"
- rotate geared motor 90° on transmission
- insert gear H 15 (insert from red marked side)
- adaptor No. 13
- turn transmission side of geared motor towards inside of car
- affix geared motor with two brackets shortened 2.2"
- grommet No. 1
- cap No. 1



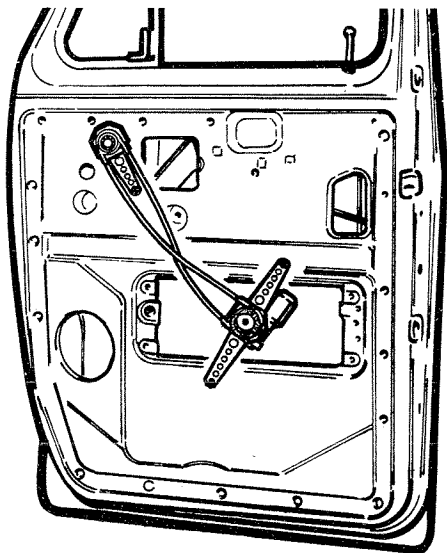
**FORD AEROSTAR front left**

- adjust bracket on transmission
- insert gear H 15 (insert from red marked side)
- adaptor No. 12
- turn transmission side of geared motor towards inside of car
- affix geared motor with two brackets
- grommet No. 1
- cap No. 1



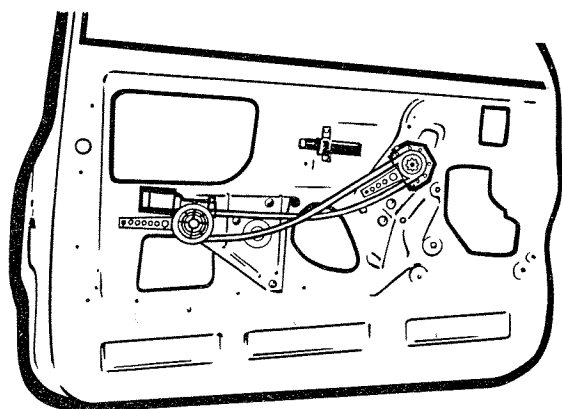
**FORD RANGER mod. '89 front right**

- insert gear H 15 (insert from red marked side)
- adaptor No. 2
- turn transmission side of geared motor towards
- affix geared motor with two brackets after having shortened
- grommet No. 1
- cap No. 1



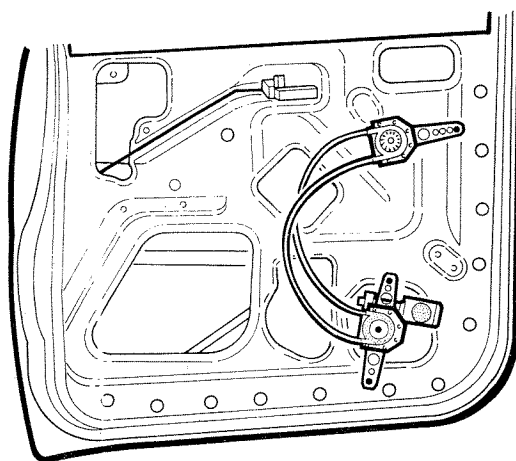
**FORD VAN mod. '86 (E350) front right**

- shorten bracket on transmission 1"
- gear H 15 (insert from red marked side)
- adaptor No. 12
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets after shortening them 0.6" off
- grommet No. 1
- cap No. 1



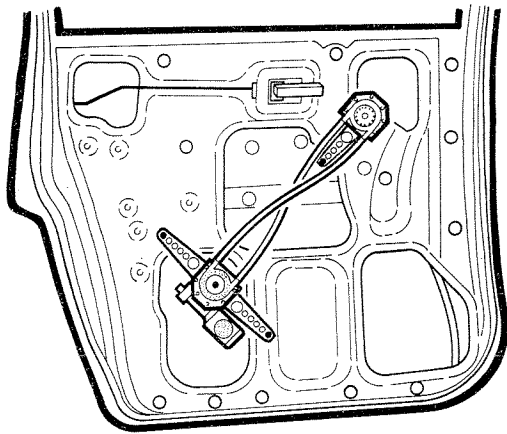
**ISUZU PICKUP front left**

- rotate gered motor 90° on transmission
- insert gear H 15 (insert from opposite side of red market side)
- adaptor No. 1
- apply paddings to gered motor
- turn grill side of gered motor towards inside of car
- affix gered motor with bracket
- grommet No. 1
- cap No. 1



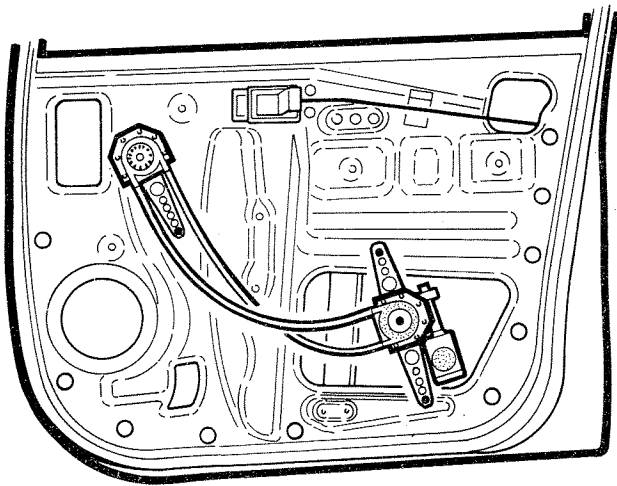
**ISUZU TROOPER (4 Doors - mod. '91) front left**

- shift brackets on transmission
- rotate gered motor 90° on transmission
- gear H 15 (insert from red marked side)
- adaptor No. 11
- turn transmission side of gered motor towards inside of car
- fasten gered motor with two brackets properly cut
- grommet No. 1
- cap No. 1



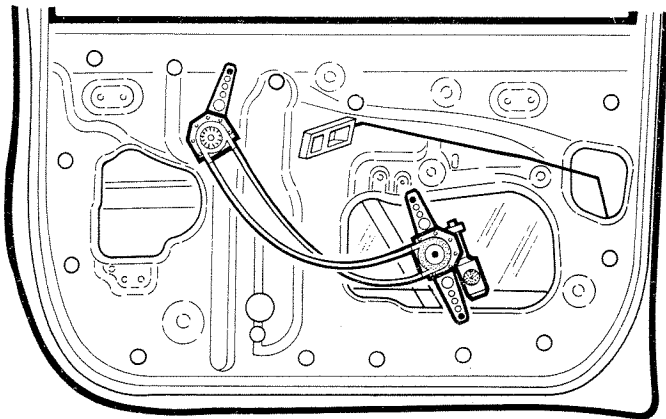
### ISUZU TROOPER mod. '91 rear right

- gear H 15 (insert from red marked side)
- adaptor No. 11
- turn transmission side of geared motor towards inside of car
- fix geared motor with two brackets
- grommet No. 1
- cap No. 1



### NISSAN PICK-UP mod. '89 front right

- gear H 15 (insert from red market side)
- adaptor No. 1
- turn transmission side of geared motor towards inside of car
- fasten geared motor with two brackets properly cut
- grommet No. 1
- cap No. 1



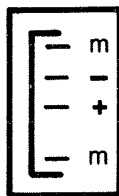
### TOYOTA TRUCK 4x4 front right

- shift bracket on transmission
- gear H 15 (insert from red marked side)
- adaptor No. 8
- turn transmission side of geared motor towards inside of car
- fasten geared motor with two brackets properly cut
- grommet No. 1
- cap No. 1

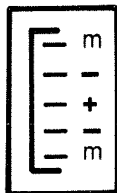
# SWITCH CONNECTION DIAGRAMS

**NOTE!** Make sure that the seats where the switches are housed are not narrow in order to avoid malfunctions or jamming or are not too tight which could cause damage to the motor. Whenever possible, use the TEMPLATE supplied with the KIT.

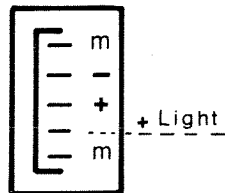
Switch with 4 contacts  
Ex: Art. 17400031



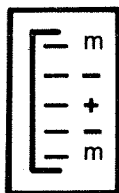
Switch with 5 contacts  
Ex: Art. 17400007-17400044



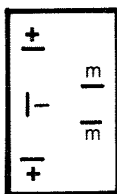
Illuminated switch with 5 contacts  
Ex: Art. 17400032-59-69



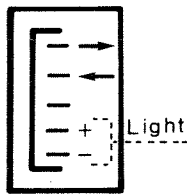
Switch with 5 contacts  
Ex: Art. 17400010-17-22-34



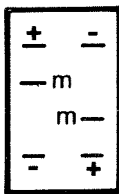
Switch with 5 contacts  
Ex: Art. 17400042  
(Audi 80/100/200 original switch)



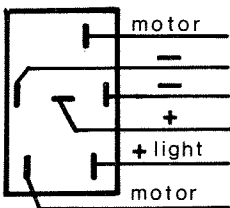
Rear isolator switch  
Ex: Art. 17400055



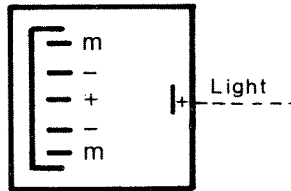
Switch with 6 contacts  
Ex: Art. 17400011-14-18-23-24-26-27-33



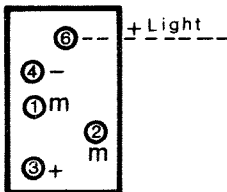
Illuminated switch with 6 contacts  
Ex: Art. 17400045-48-49-50-51-52-66-67-68  
70-72-74



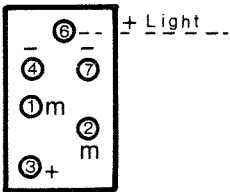
AUSTIN METRO/MONTEGO  
Original switch with separate light



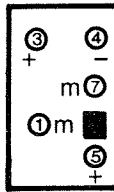
MERCEDES 190  
Illuminated switch (front)



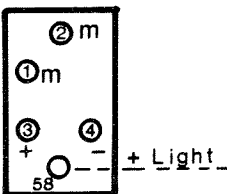
MERCEDES 190  
Illuminated switch (rear)



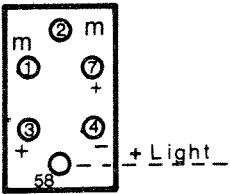
OPEL CORSA  
Switch front



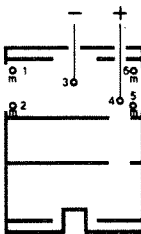
MERCEDES TYPE W124  
Illuminated switch (front)



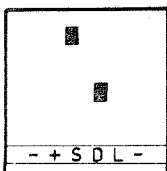
MERCEDES TYPE W 124  
Illuminated switch (rear)



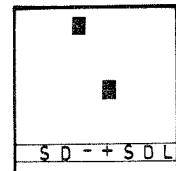
BMW SERIE 5 mod. '88  
Switch with 6 contacts  
Ex: Art. 17400057



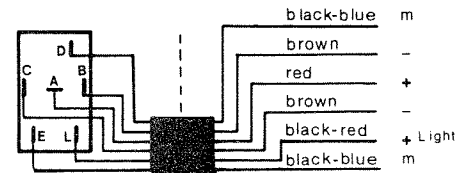
Illuminated switch with 6 contacts  
Ex: Art. 17400065-75



Illuminated switch with 7 contacts  
Ex: Art. 17400071



Illuminated switch with 6 contacts  
Ex: Art. 17400047-54




# ELECTRICAL WIRING DIAGRAMS

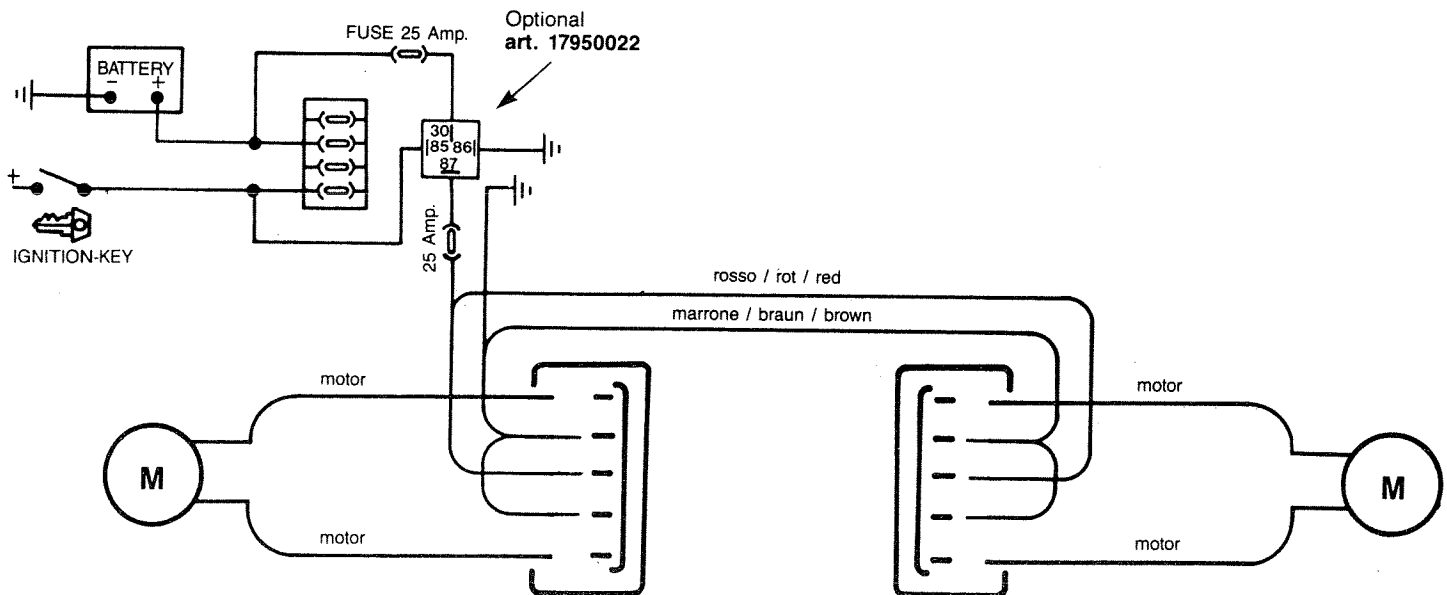
Listed here are wiring diagrams of typical installations for the  **SPAL** Electric window kits using the SPAL wiring kits.

**NOTE!** For safety reasons it is necessary that the power supply to the windows be connected to the appropriate terminal of the ignition side of the ignition relay block. It is recommended that only SPAL wiring kits be used. If this is not possible, proper wiring of at least 16 AWG must be used with the suitable in-line fuse.

**SPAL/IEITC** assumes no liability in case of non-compliance with the above mentioned note.

## 1 **ELECTRICAL CIRCUIT: 2 SWITCH WITH 5 CONTACTS**

\* Use original  **SPAL** wiring, Art. 33020001 complete with 25 Amp. fuse.

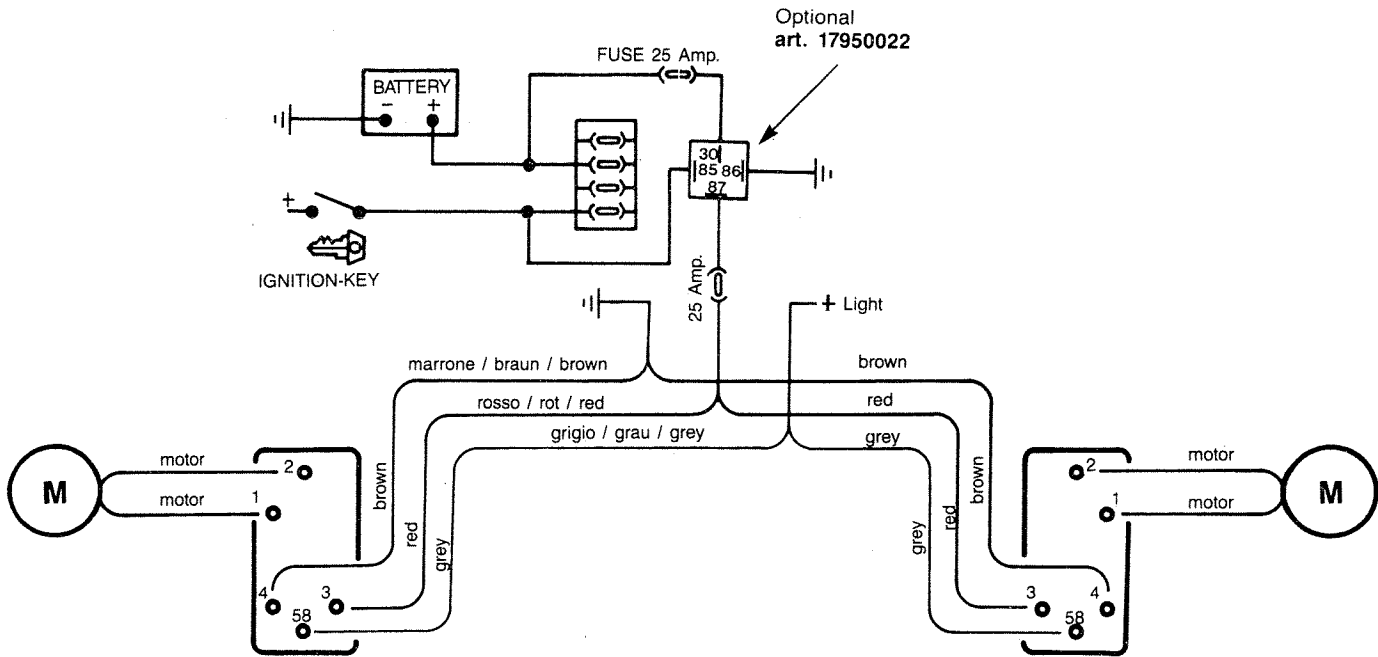







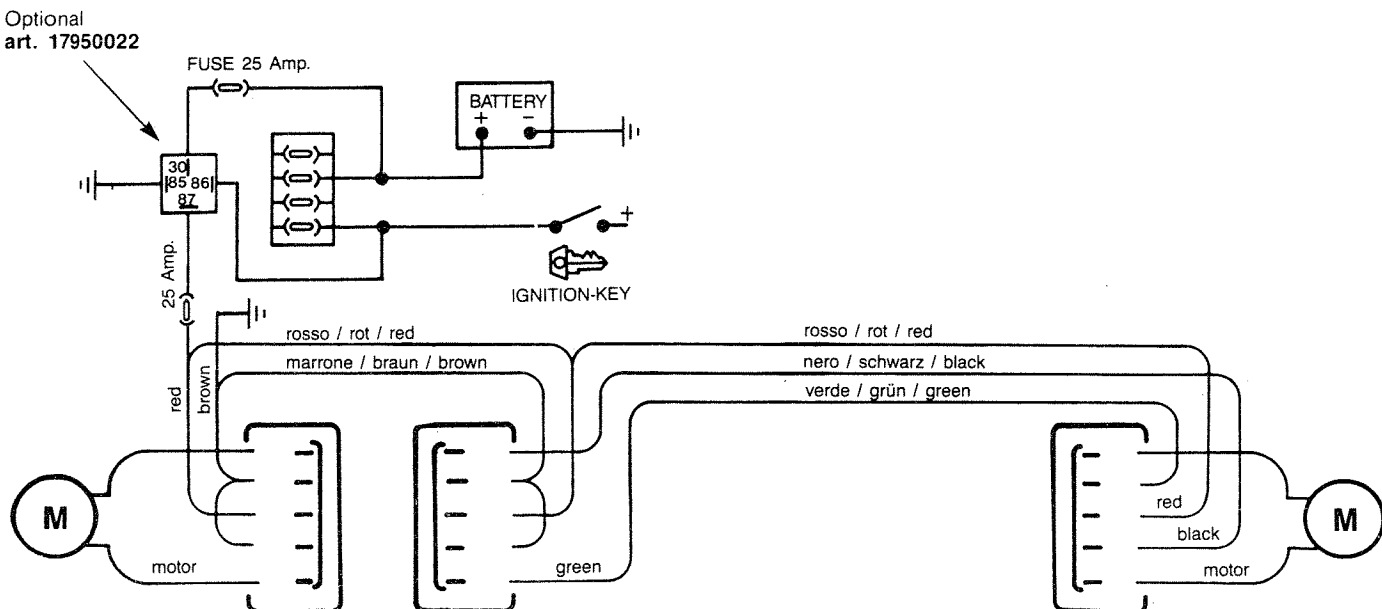
## ELECTRICAL CIRCUIT: 2 ORIGINAL MERCEDES W 124 SWITCH

\* The  **SPAL** wiring for this circuit is contained in the switch Kit, Art. 33040027.




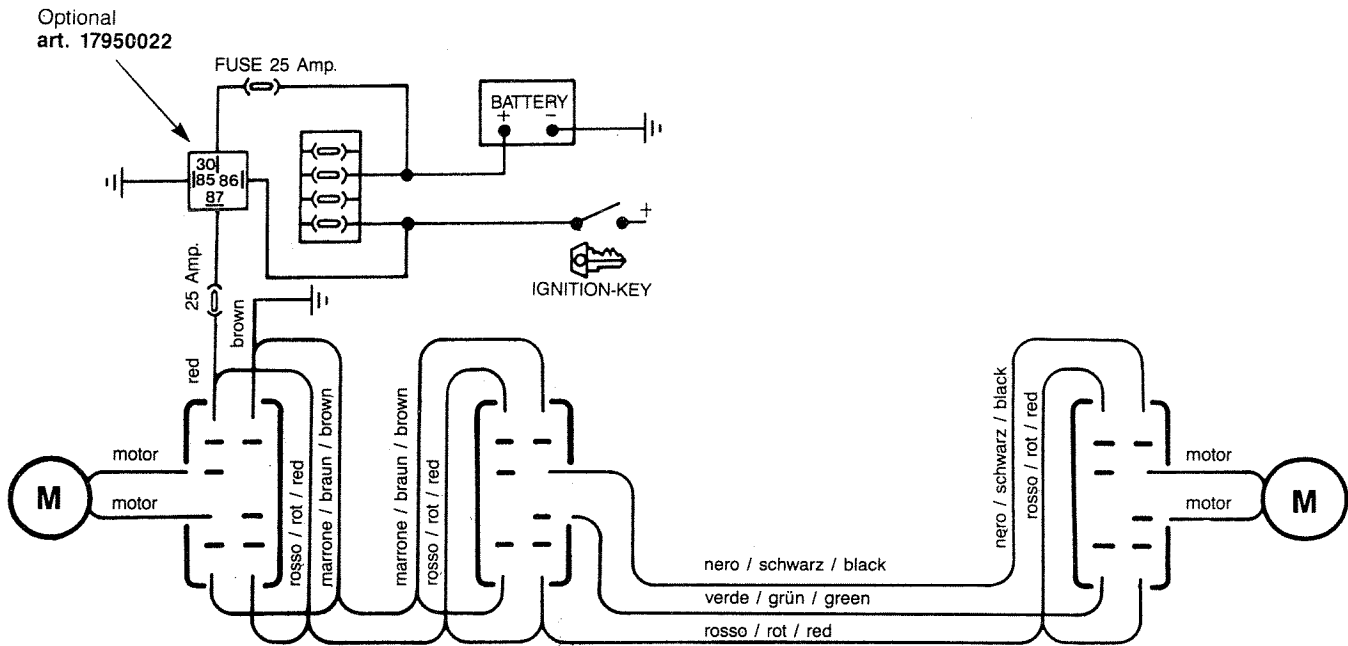
## ELECTRICAL CIRCUIT: 3 SWITCH WITH 5 CONTACTS

\* Use original  **SPAL** wiring, Art. 33020005 complete with 25 Amp. fuse.




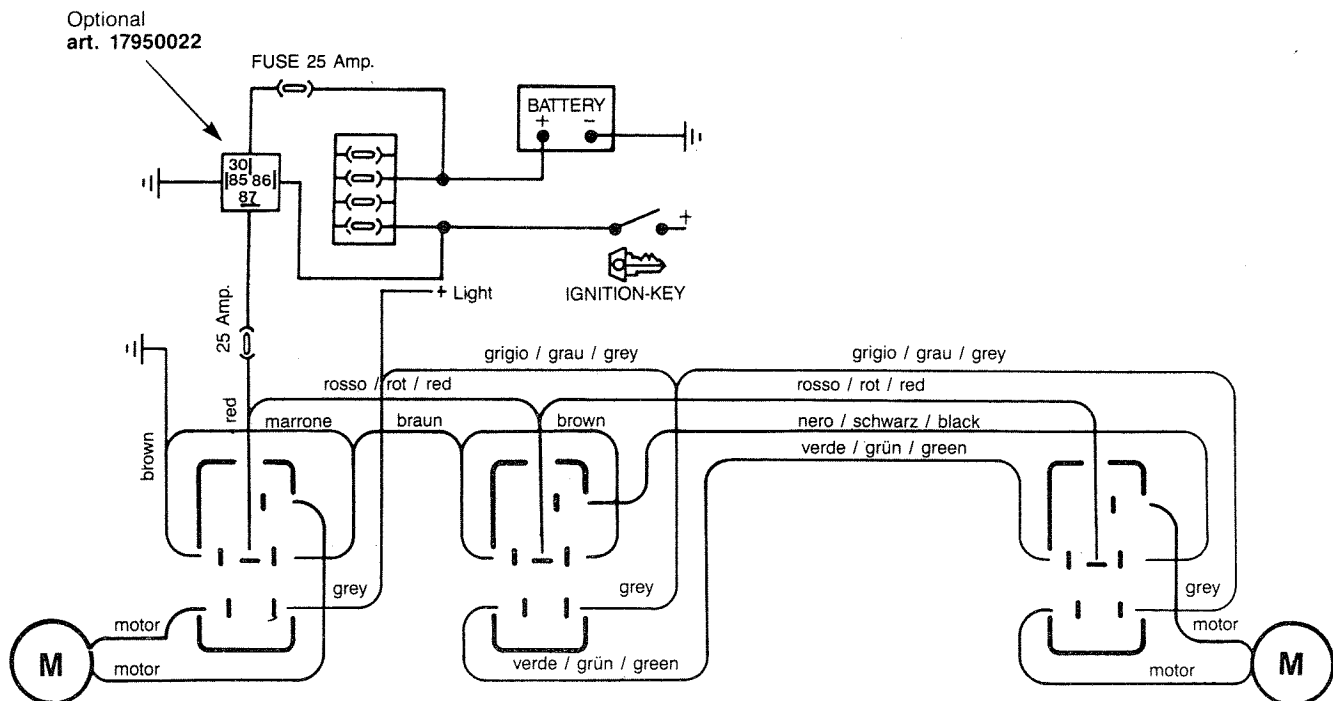
## ELECTRICAL CIRCUIT: 3 SWITCH WITH 6 CONTACTS

\* Use original  **SPAL** wiring, Art. 33020004 complete with 25 Amp. fuse.



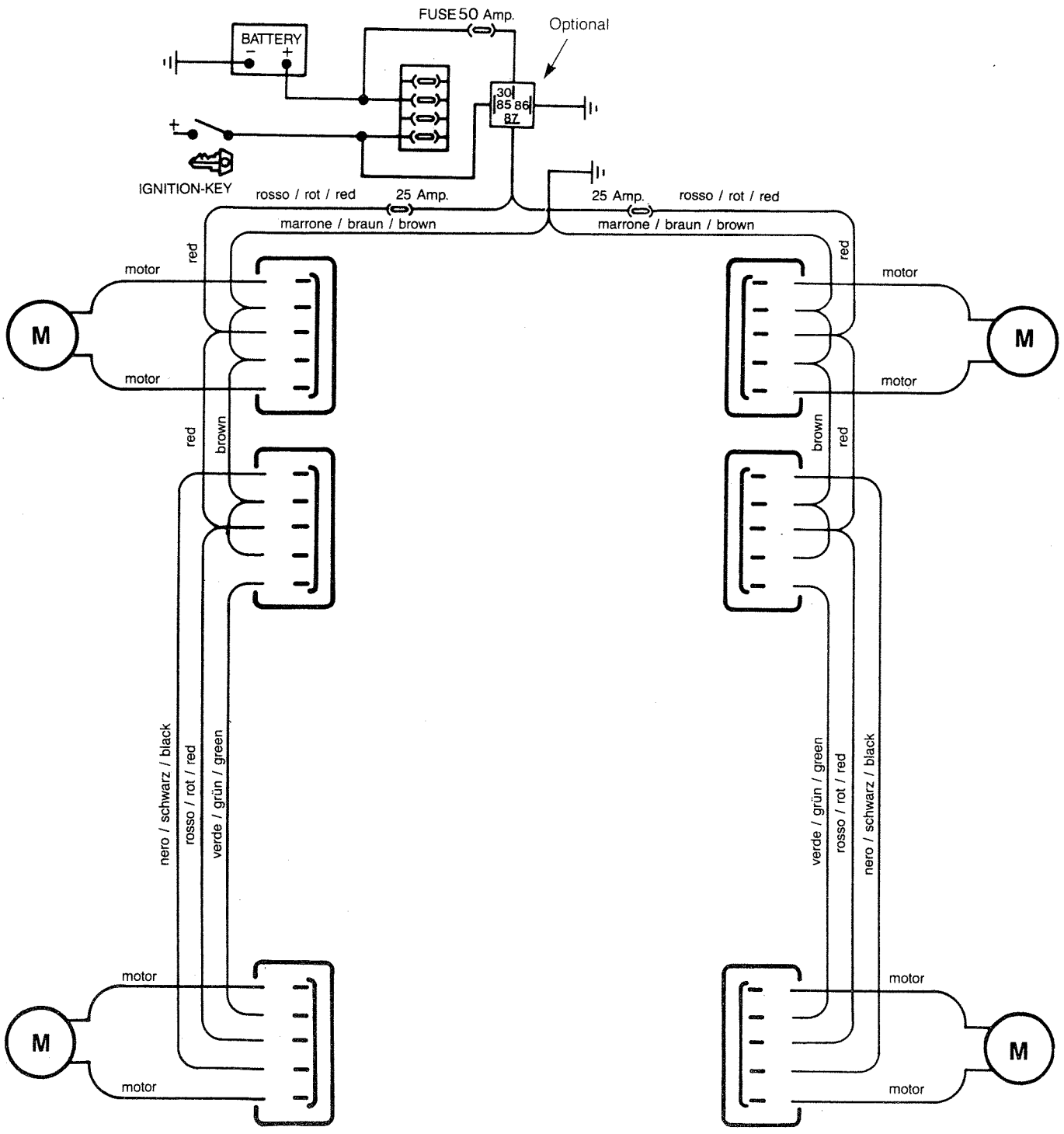
## ELECTRICAL CIRCUIT: 3 SWITCH WITH 6 CONTACTS AND SEPARATE LIGHT

\* Use original  **SPAL** wiring, Art. 33020010 complete with 25 Amp. fuse.




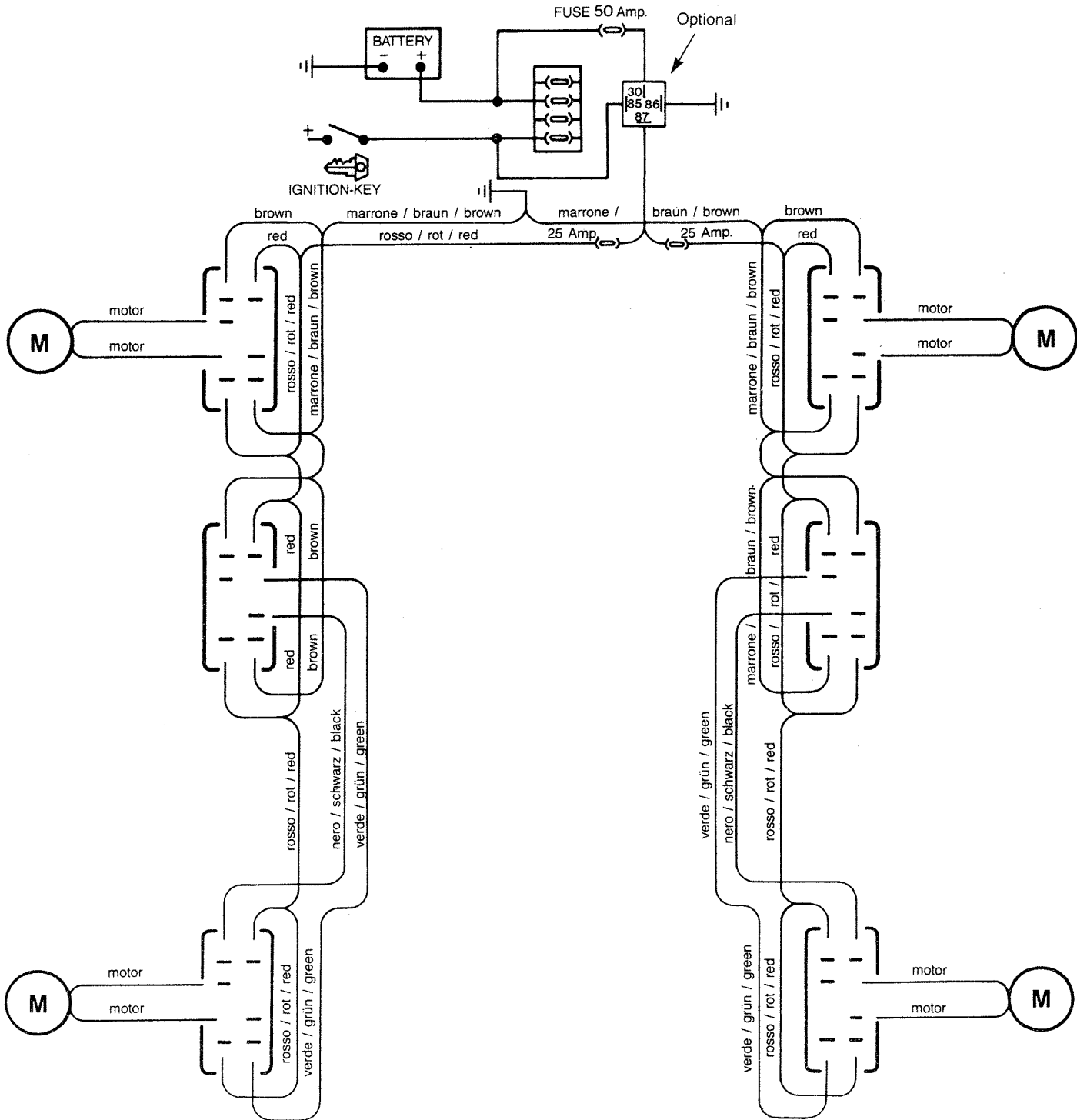
# ELECTRICAL CIRCUIT: 6 SWITCH WITH 5 CONTACTS

\* Use 2 original SPAL wiring, Art. 33020005 complete with 25 Amp. fuses.




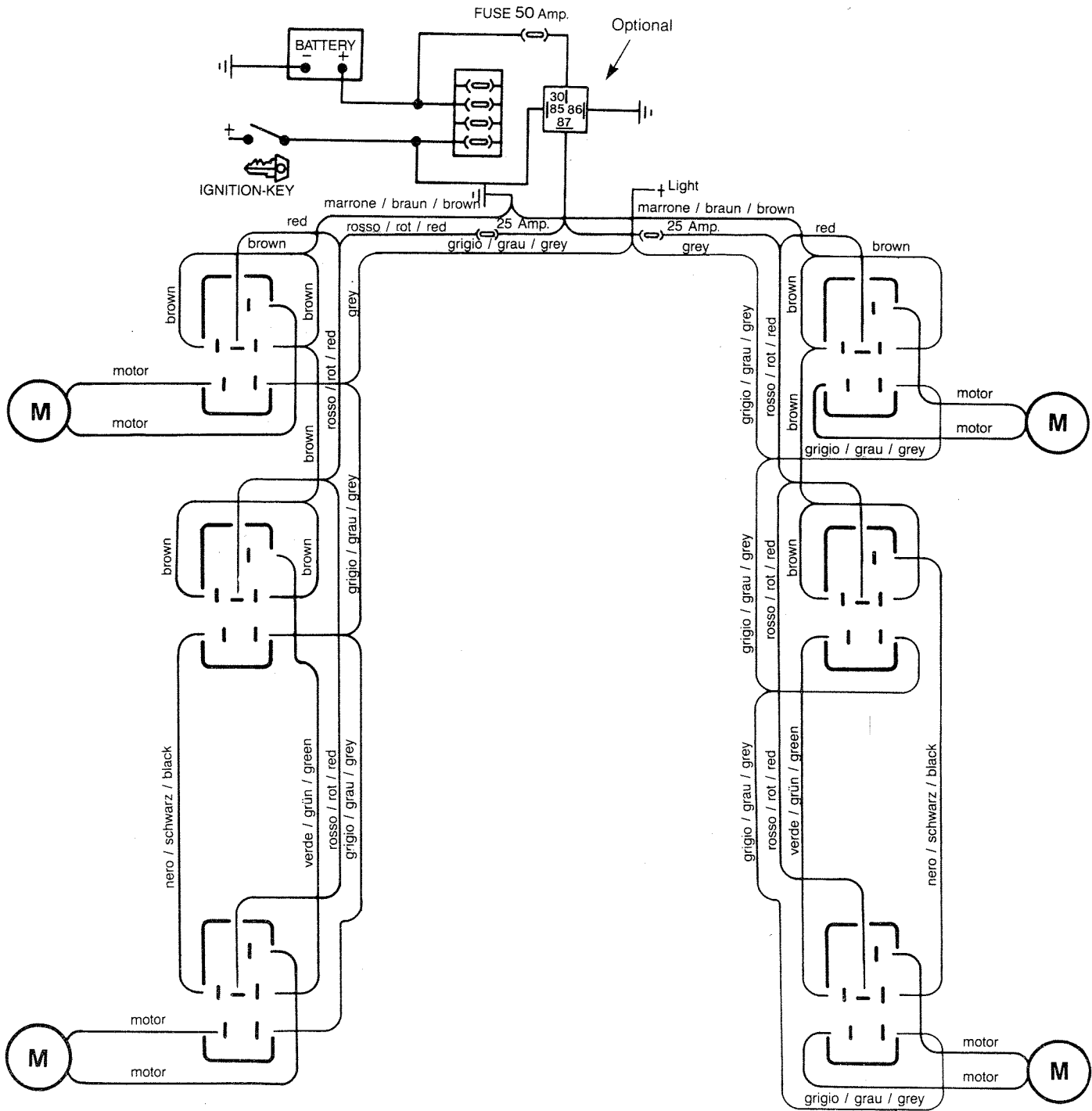
# ELECTRICAL CIRCUIT: 6 SWITCH WITH 6 CONTACTS

\* Use 2 original  **SPAL** wiring, Art. 33020004 complete with 25 Amp. fuses.



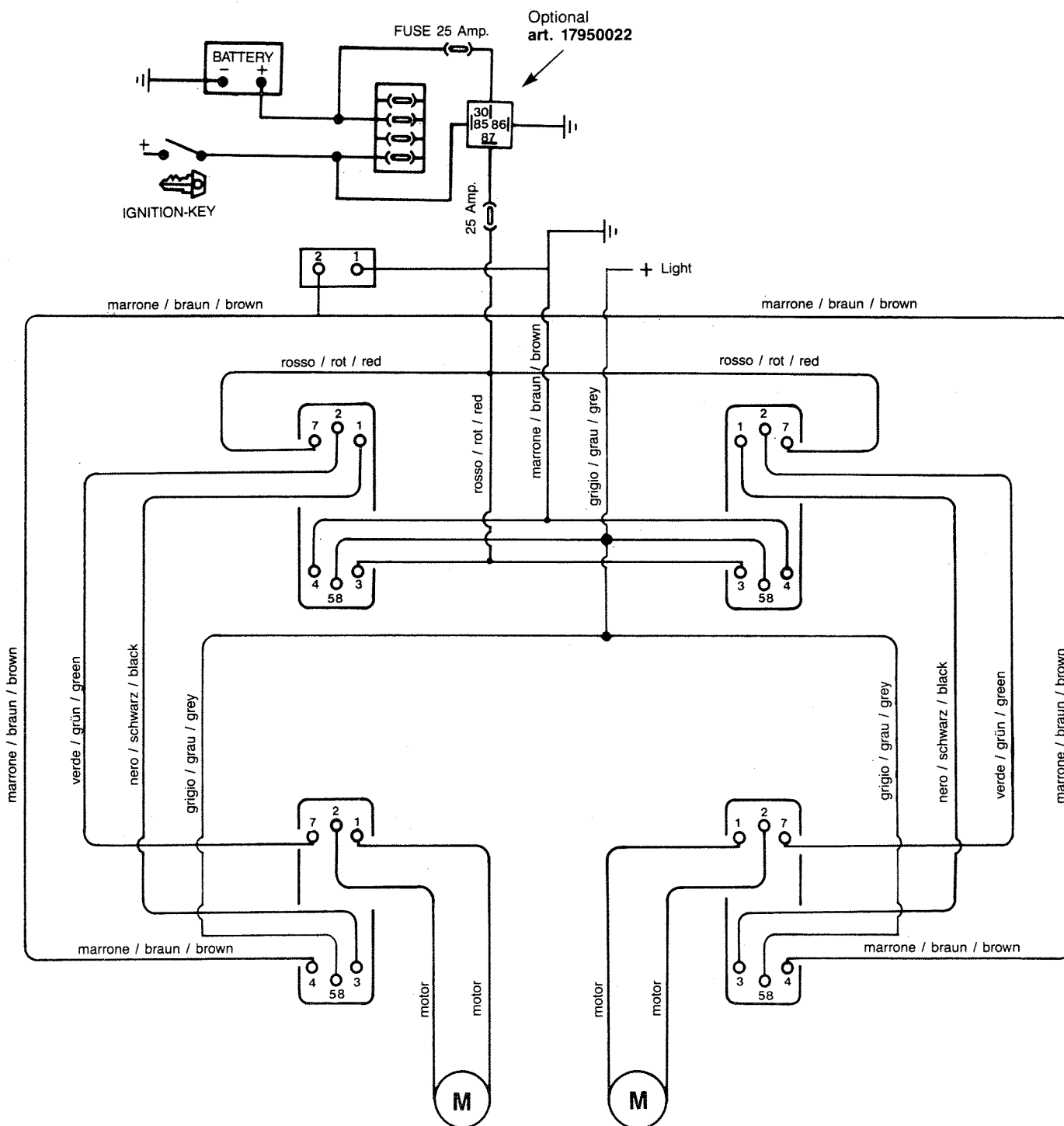
# ELECTRICAL CIRCUIT: 6 SWITCH WITH 6 CONTACTS AND SEPARATE LIGHT

\* Use 2 original  **SPAL** wiring, Art. 33020010 complete with 25 Amp. fuses.



# ELECTRICAL CIRCUIT: 4 ORIGINAL MERCEDES W 124 SWITCH

\* The wiring for this circuit is contained in the switch Kit, Art. 33040028.

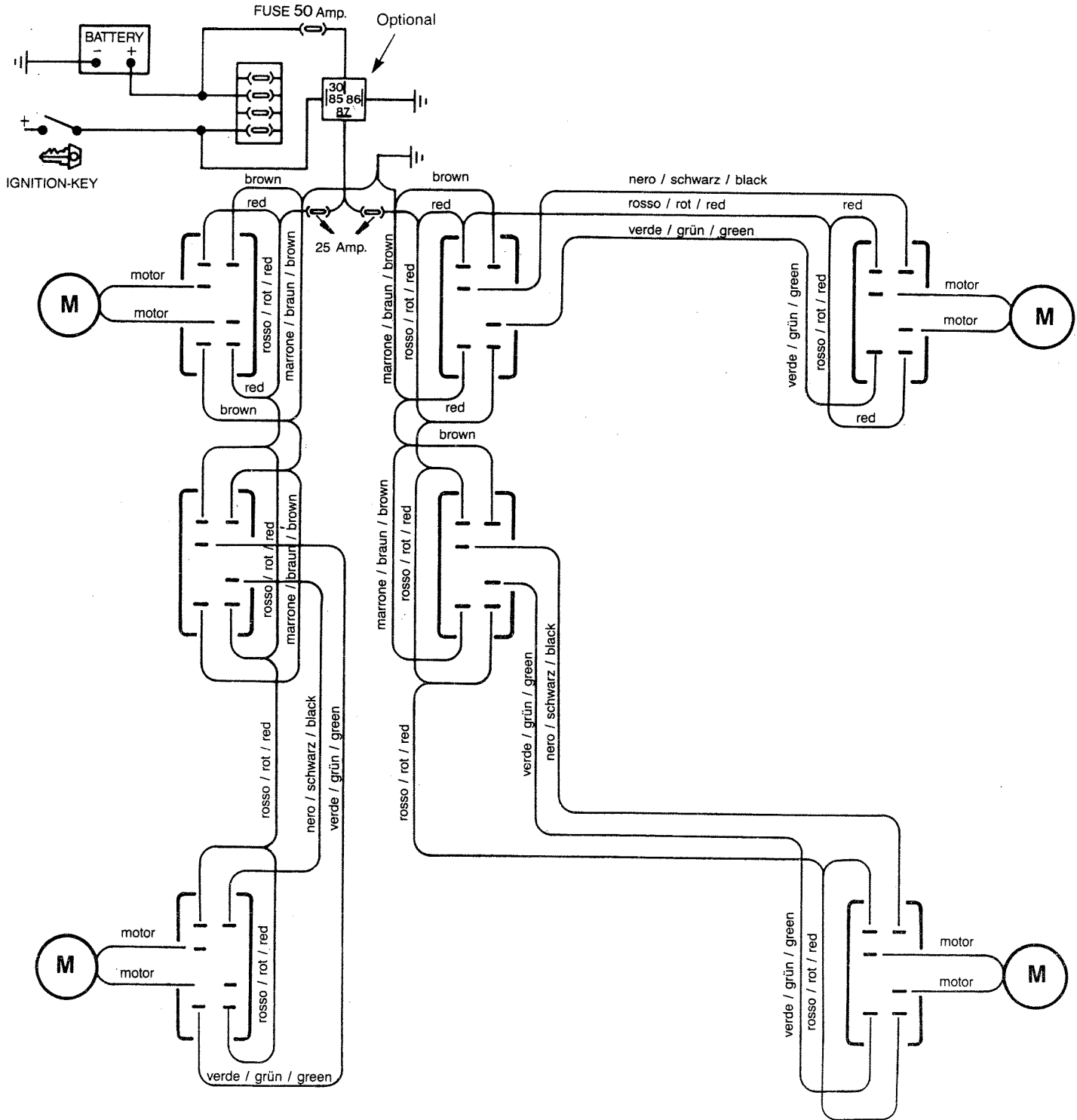






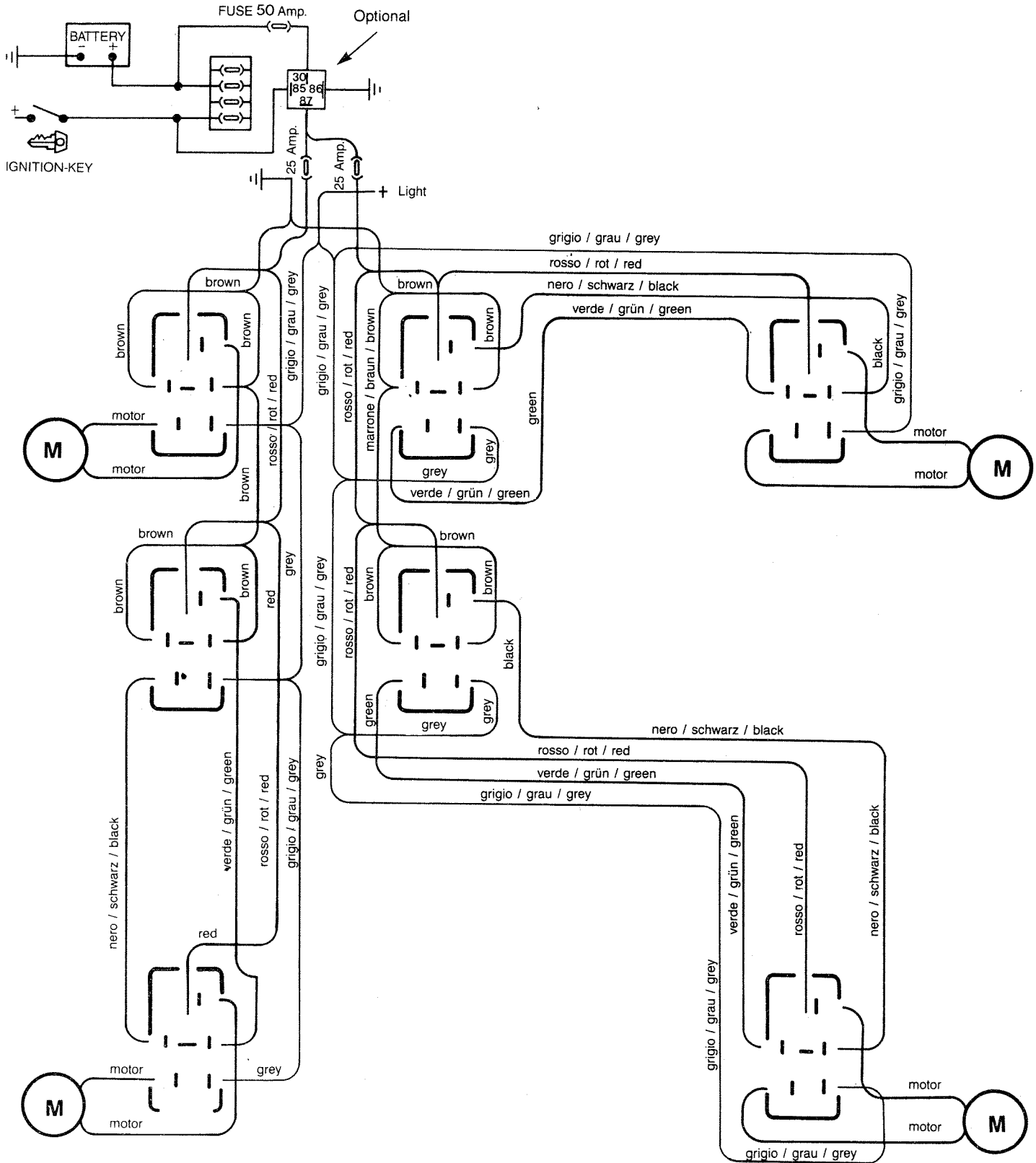
# ELECTRICAL CIRCUIT: 7 SWITCH WITH 6 CONTACTS

\* Use cable with a minimum 16 AWG and with suitable fuses.



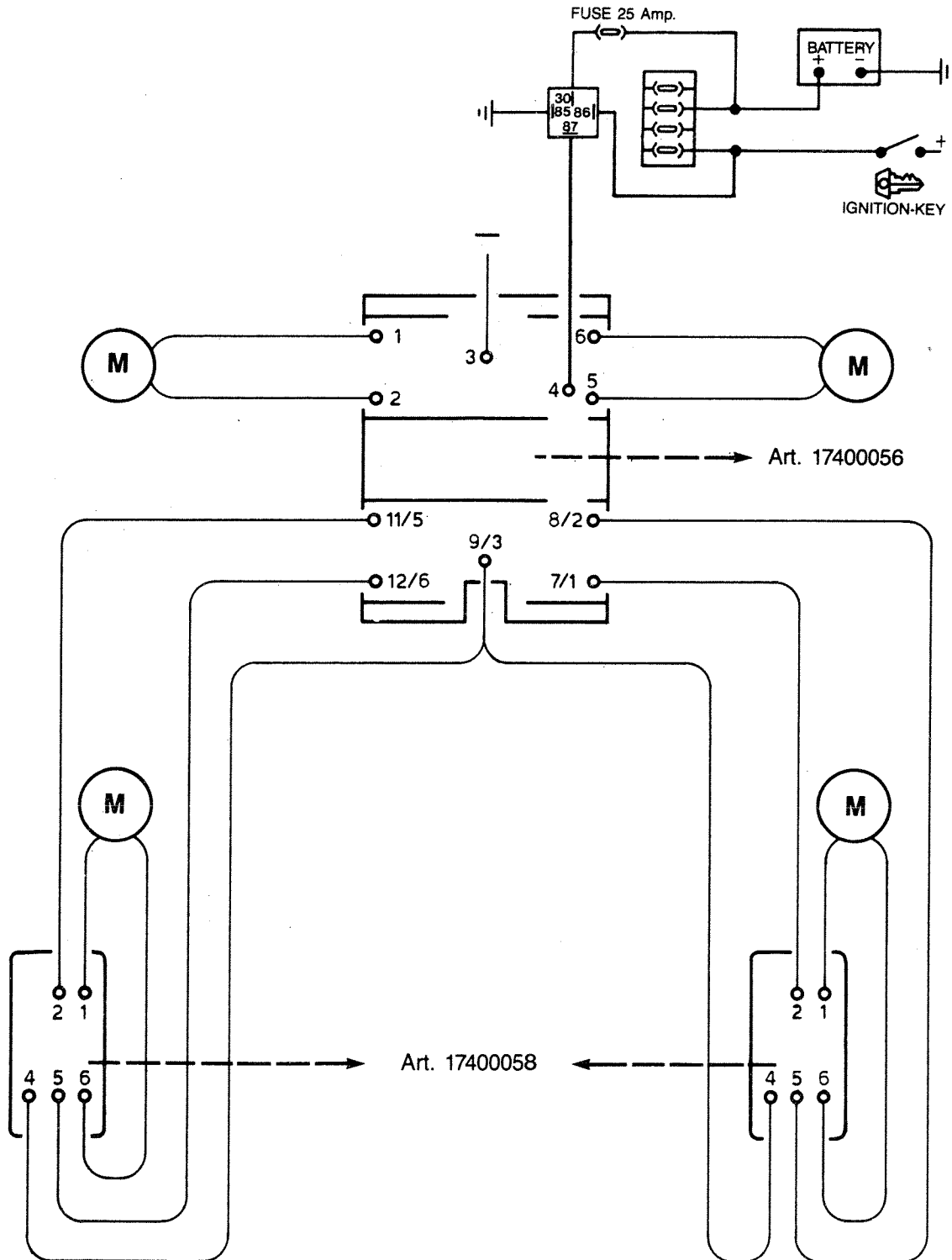
# ELECTRICAL CIRCUIT: 7 SWITCH WITH 6 CONTACTS AND SEPARATE LIGHT

\* Use cable with a minimum 16 AWG and with suitable fuses.



# ELECTRICAL CIRCUIT: 6 ORIGINAL BMW SERIE 5 mod. '88 SWITCH

\* Use cable with a minimum 16 AWG and with suitable fuses



It is the responsibility of  **SPAL** to update this manual.

For additional vehicle applications or information please contact:

**IEITC**

512 Tuttle Street - Des Moines, IOWA 50309-4618  
Tel. (800) 345-0327 - Fax (515) 245-2878



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