



# 700852

## 6-SPEED CONVERSION KIT FOR BIG TWIN 5-SPEED TRANSMISSIONS



# INSTALLATION INSTRUCTIONS



INTERNATIONAL HEAD OFFICE  
THE NETHERLANDS  
Zodiac International B.V.  
Tel: +31 (0) 297 288 621  
Fax: +31 (0) 297 288 226  
sales@zodiac.nl  
www.zodiac.nl

FRANCE  
Zodiac France  
Tel.: 01 45 93 10 75  
Fax: 01 45 93 18 41  
zodiac-france@zodiac.nl

NORWAY  
Zodiac Scandinavia  
Tel.: +46 (0) 1 71 47 32 40  
Fax: +46 (0) 1 71 47 32 41  
zodiac-scandinavia@zodiac.nl

GERMANY  
Zodiac Deutschland  
Tel.: 021 54 42 88 28  
Fax: 021 54 41 27 15  
zodiac-deutschland@zodiac.nl

SPAIN  
Zodiac Espana  
Tel.: 96 81 42067  
Fax: 96 81 42068  
zodiac-espana@zodiac.nl

GREAT-BRITAIN  
Zodiac U.K.  
Tel.: 014 53 75 84 51  
Fax: 014 53 75 29 39  
zodiac-uk@zodiac.nl

SWEDEN  
Zodiac Scandinavia  
Tel.: 01 71 47 32 40  
Fax: 01 71 47 32 41  
zodiac-scandinavia@zodiac.nl

FRANCE  
FC Parts  
Tel.: 03 27 85 57 15  
Fax: 03 27 85 96 50  
fcparts@wanadoo.fr

ITALY  
Zodiac Italia  
Tel.: 02 64 72 287  
Fax: 02 64 74 95 55  
zodiac-italy@zodiac.nl

HUNGARY  
Zodiac Hungary  
Tel.: (+36) 30 217 18 32  
Fax: (+36) 87 480 882  
zodiac@chello.hu

SWITZERLAND  
American Bike Shop  
Tel: 07 17 61 26 78  
Fax: 07 17 61 06 78  
abs-zodiac@rheintal.ch



## INSTALLATION INSTRUCTIONS FOR 6 SPEED CONVERSION KIT AND 6 SPEED BUILDER KIT

We recommend the kits are installed by a qualified mechanic with knowledge of the Harley-Davidson 5 speed transmission. Also make sure you have a 1990 or later Factory Service Manual available. Tools needed are the same as used for a 5 Speed transmission.

The conversion kit should only be used in new or low milage transmissions. If gears or bearings of a used 5 speed transmission are worn, new ones must be installed, or better, the builder kit should be used.

### Gear set Removal

Refer to the Factory Service Manual Section for Mainshaft and Countershaft removal. When you get to the point of actually sliding the gear set out make sure you properly mark the 5th gear set as described in the Factory Service Manual (for used transmissions only). Further follow the factory removal procedure.

### Clearance Checks

The 6 Speed conversion and builder kit will fit in most OEM or aftermarket transmission housings without any modification of the housing. However due to casting differences, in some instances some modification may be needed. The following clearances must be checked before assembling the 6 speed transmission.

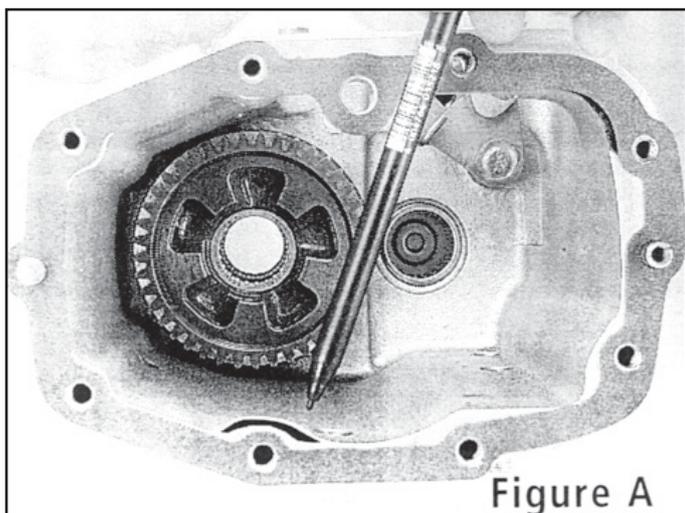


Figure A

### 5/16 Bolt hole boss clearance

This can easily be checked with the trap door gasket. Put the gasket on the dowel pins. All material of the boss around the hole that "sticks outside" the gasket (60 degrees forward to 60 degree backwards) must be removed (see figure A).

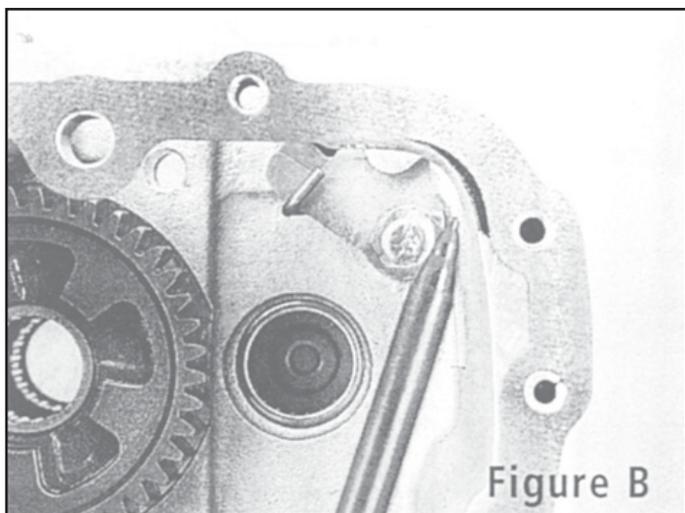
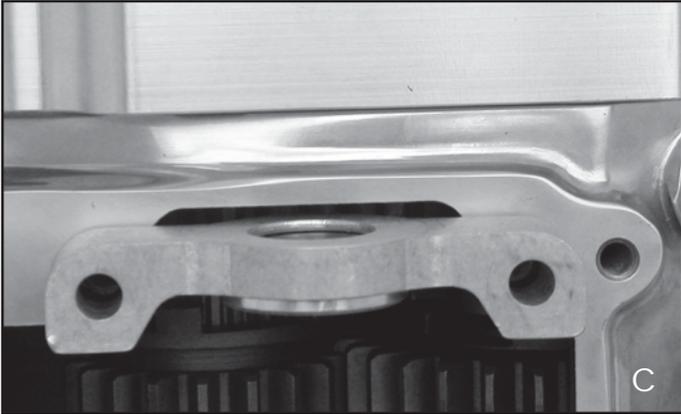


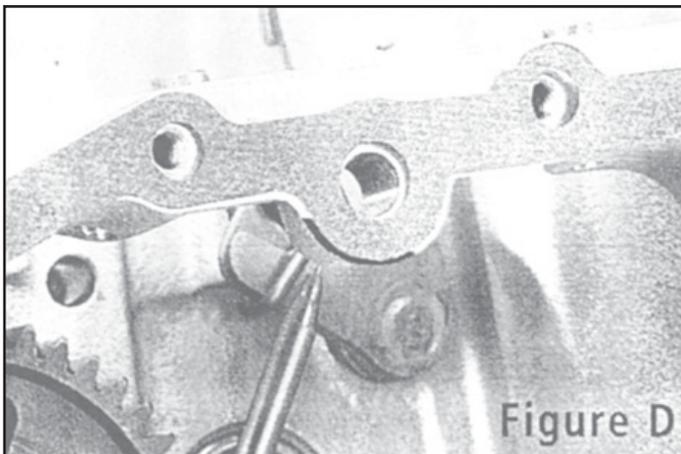
Figure B

### Primary fork clearance

Place the gasket on the housing and remove material as indicated for clearing the shifter fork (see figure B).



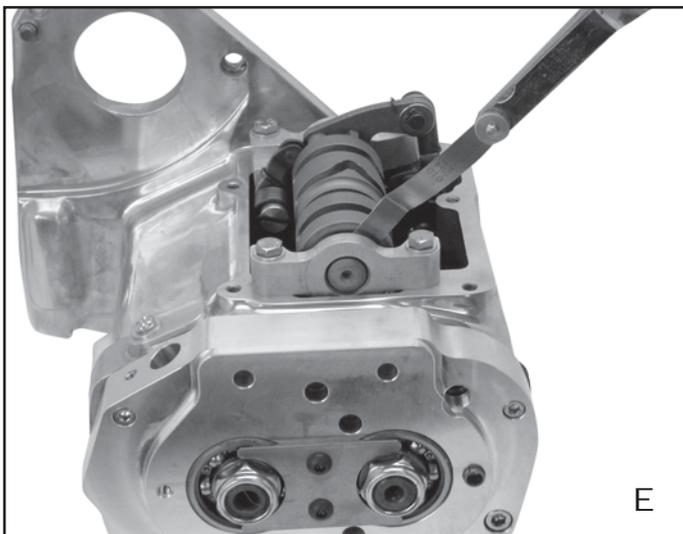
Pillow block clearance (right side)  
Make sure there is clearance between the pillow block and the housing. Any clearance is O.K. (see figure C).



Fork shaft support clearance  
Again use the gasket as the template and remove the material as indicated (see figure D).

#### Top cover clearance

Some aftermarket top covers are thicker than their OEM counter part. Clearance between the cover and shift drum, shift ratchet and other parts should be checked.



Shift drum end play  
The end play of the shift drum must be checked prior to final installation. Install the shift drum. Measure the end play with feeler gauges at the right pillow block (see figure E).  
End play should be between .004" and .010", some 1/2" X 7/8" 0.008" thick shims are included to adjust the end play.



## YOU ARE NOW READY TO BEGIN THE FINAL INSTALLATION

Install the trap door bearings and install the bearing retainer plate using 2 1/4" UNC button head allen screws (use Loctite to secure the screws). Install the auxiliary shifter shaft support using 2 1/4" UNC button head allen screws (use Loctite to secure the screws). Install the gears on the main and counter shaft using the washers, bearings and clips included in the kit and install the shafts in the trap door. NOTE: Put the 3/4" X 1" X .040" steel bearing washer on the mainshaft (comes between the needle bearing and trap door bearing) before installing the mainshaft in the trap door. There is no washer on the countershaft and the trap door. Install the main and counter shaft nuts and torque them to factory specs.

When using the conversion kit, you must transfer some of the 5-speed gears to the 6 speed. Take the 5th gear and the 2nd gear from the countershaft and install them on to the 6 speed countershaft (in the same direction as they were in the 5 speed, do not turn them around) using the new bearing and thrust washer included in the kit. Use the new retaining ring that is provided and install it after you put the 5th gear on the countershaft. Remove the 2nd gear from the mainshaft and re-install it on to the 6 speed (in the same direction as it was in the 5 speed).

Put the trap door gasket on the case dowel pins. You can use same thick grease to make the gasket stick to the housing.

Apply some oil to the gears and shafts and on to the main drive gear seal. Install the gear set by sliding the mainshaft through the main drive gear and slowly pushing the whole trap door/gear set assembly until the case dowel pins contact the dowel holes in the side door. (for used gears: line up the markings on the 5th gears to re-establish the proper mesh of the gears). A teflon hammer is helpful to tab the trap door.

Install the four 5/16" UNC socket head bolts in the lower 4 screw holes and torque them to factory specs. Install the two 1/4" socket head bolts in the bolt holes above the dowel pin and torque them to factory specs.

Put the shifter forks (3rd counter shaft, 2nd mainshaft and 1st mainshaft) on the shafts and slide the shifter shaft in.

Put the 4th counter shaft shifter fork on the counter shaft, and slide the auxiliary shifter shaft in. The head of the auxiliary fork shaft should be 1/2" below the surface. If needed tab the shaft until it properly seats against the support. Put some Low grade Loctite on the 1/2-20 set screw and torque it to 2-4 ft-lbs.

Check if all forks slide freely on the fork rods by moving them back and forwards. Check if forks have enough clearance with the housing (as outlined in the Clearance Checks section).

Install the shift drum assembly, make sure the fork pins are in the grooves in which they belong. Tighten down the four 7/16" hex head bolts in a circular pattern. Application of a light Loctite to the four 7/16" hex head bolts is recommended. Re-check the end play on the shift drum.

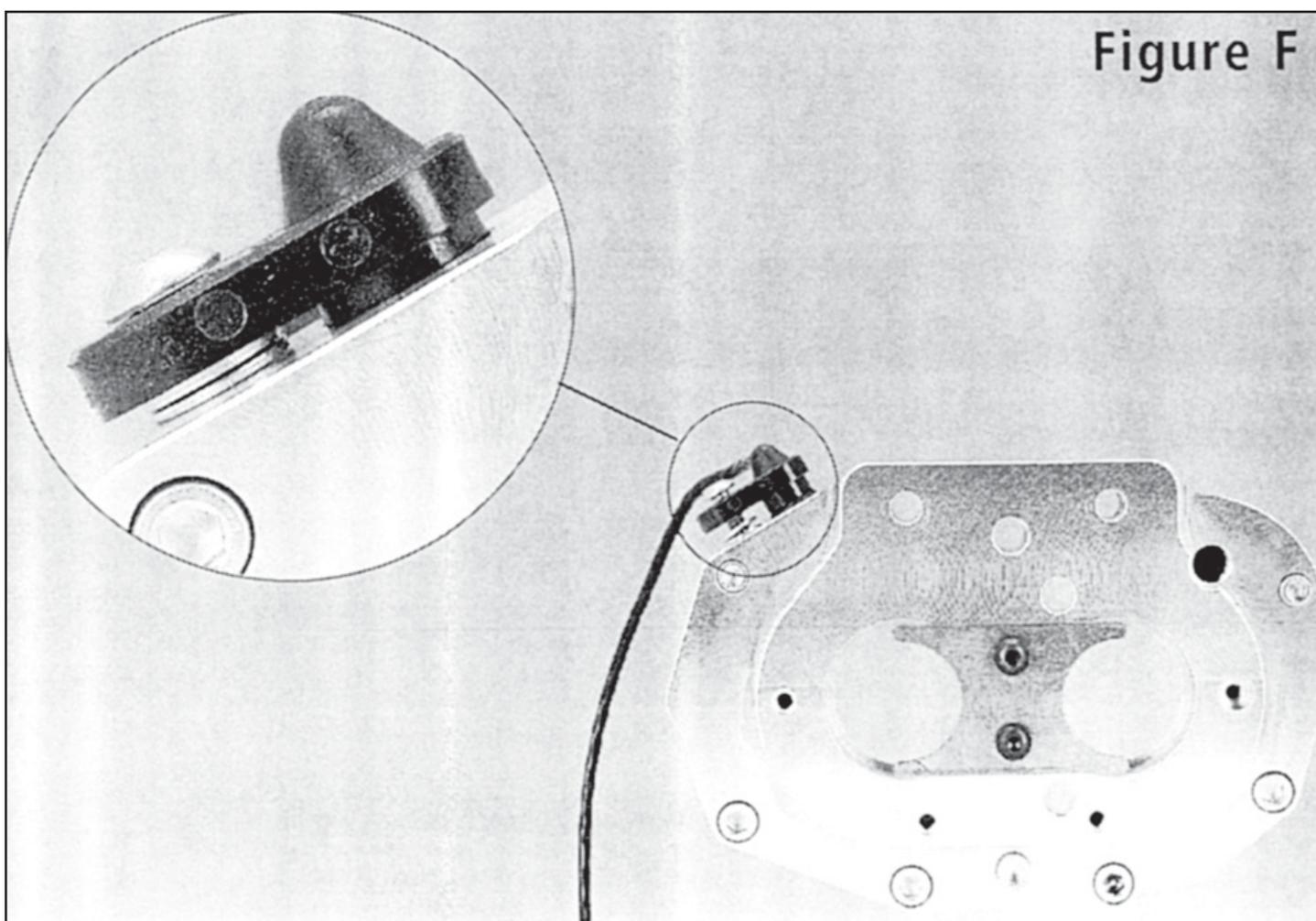
Set the adjustment on the shifter pawl adjustment screw as per the Factory Service Manual.

### Clutch Rod End

Remove the thrust bearing from the 5 speed clutch rod end and re-install it on the extended rod end provided with the kit. Install this rod end on the right side, at the end of the mainshaft, under the clutch cover. Install the clutch release cover.

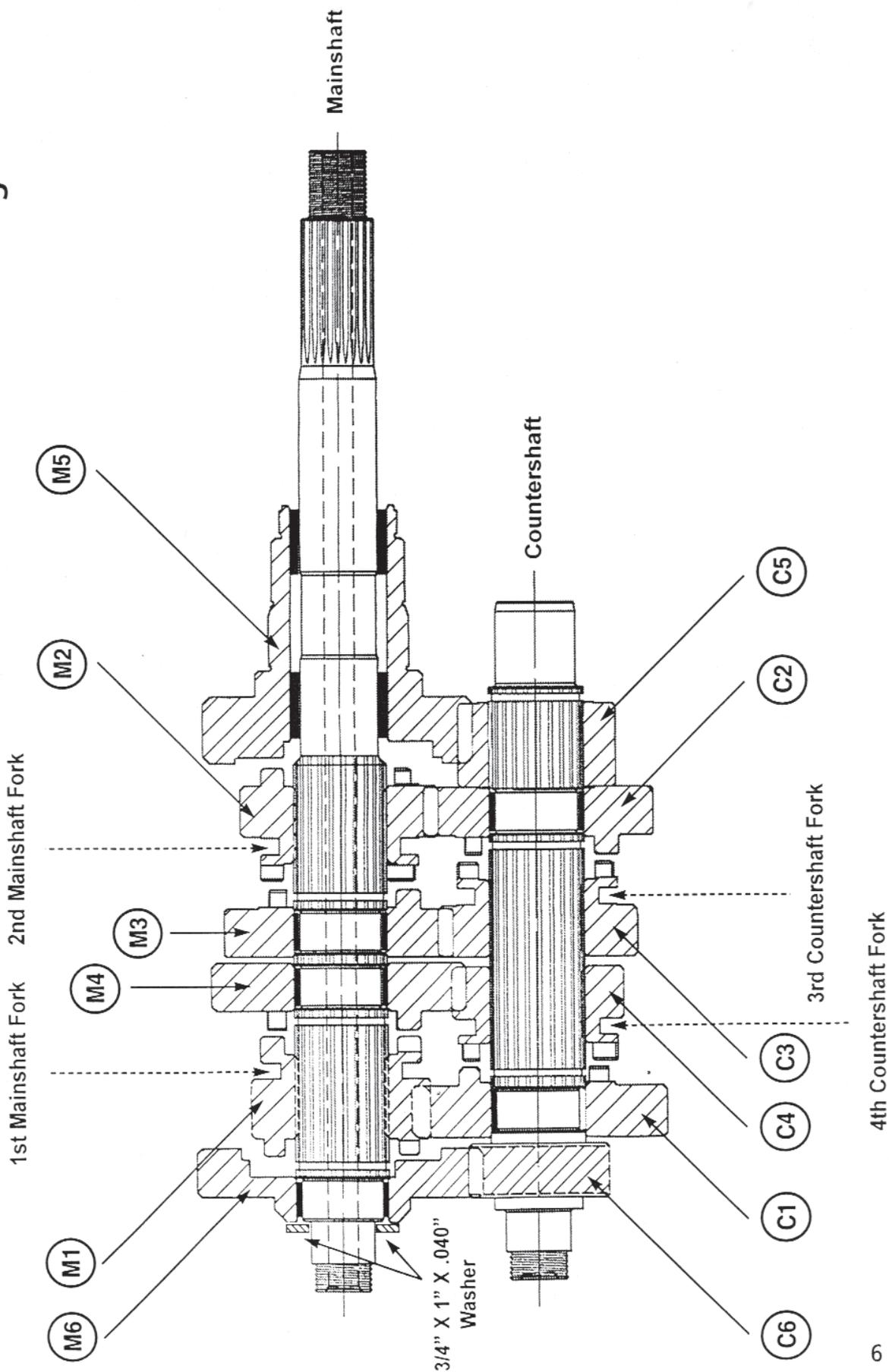
### Speed Sensor Installation

If you have a transmission case with speed sensor, replace the speed sensor with the dummy plug (with a ring), screw, and washer provided with your kit and install the speed sensor in the trap door. You must space the sensor with 1/4"1 spacer washers between the speed sensor and the trap door for proper sensor spacing to the 6th mainshaft gear that is triggering the sensor (see figure F). You may need a conversion box to correctly calibrate the speedo head (for example Dakota Digital speed re-calibration unit, model SGI-6). Fill the transmission with 20 to 24 oz. transmission oil. We recommend the use of a good 75W140 or similar transmission oil.



The installation of these parts may affect the factory warranty. It is the responsibility of the user to determine the suitability of this product for his/her use, and the user shall assume all legal, personal injury risk and liability and all other obligations, duties and risks associated there-with.

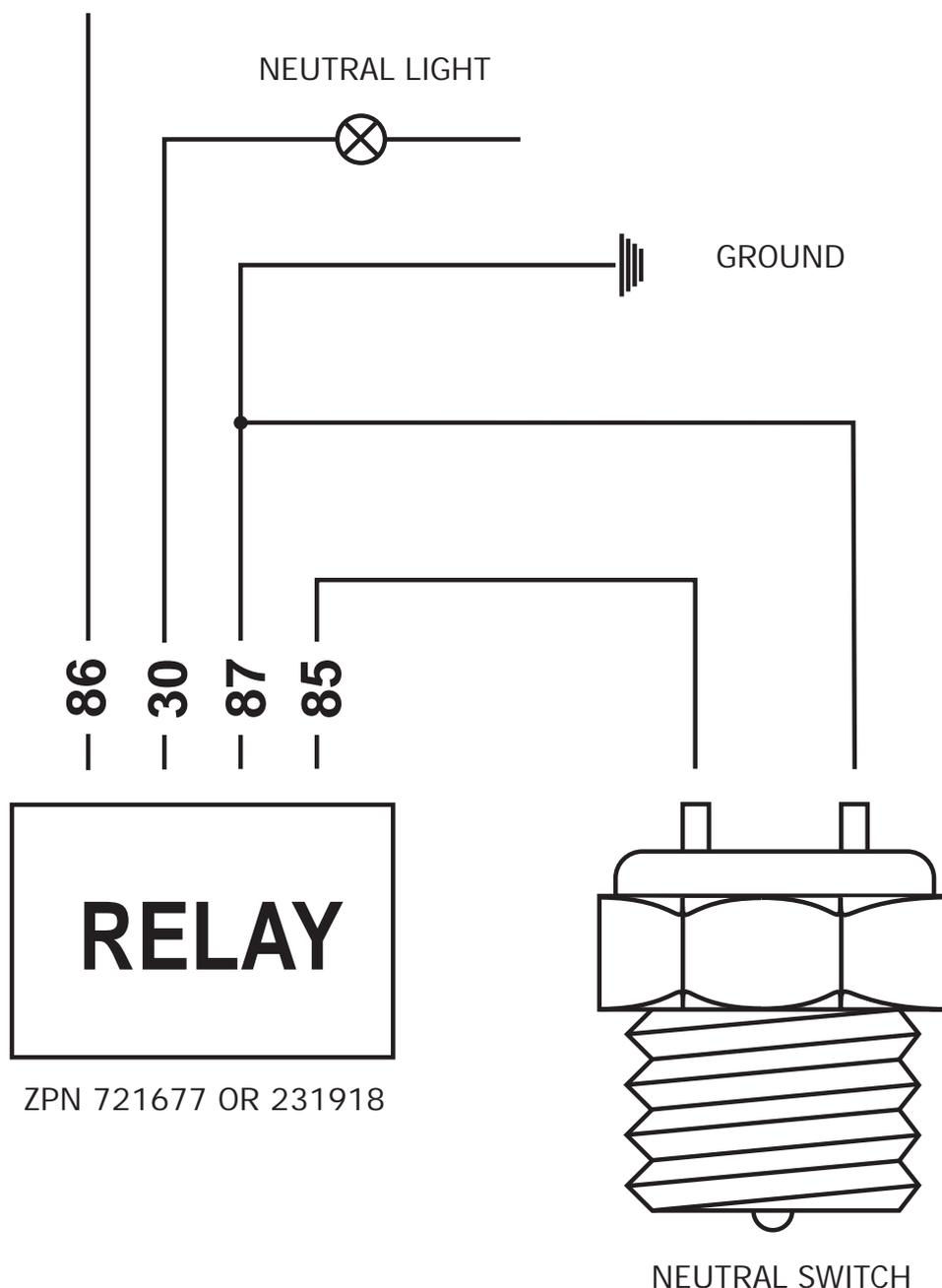
Figure G





# WIRING FOR 6-SPEED CONVERSION KIT ON 1998 AND UP MODELS WITH TWO CONNECTORS ON NEUTRAL SWITCH

+ THAT COMES ON  
WHEN IGNITION IS  
TURNED ON



30 and 87 are wires that are normally on Neutral Switch.  
Find out which is positive and which is ground, then connect as in drawing above.