



**1996 – 1999 Nissan Pathfinder (R50)
Automatic to Manual Transmission
Conversion Manual**



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Overview

This manual will, in detail, give the information you will need to convert a 4x4 1996-1999 Nissan Pathfinder from an automatic transmission to a manual transmission. Having a manual transmission in your Pathfinder gives you more control, lower gears, and more power than you would have with an automatic. Other benefits include better gas mileage, lower maintenance cost and reduced electronic dependence.

Although the part prices and part numbers are directly from the dealership many auto recyclers will have serviceable parts at a much lower price. It is highly recommended that you contact auto recyclers in your area for the manual transmission and transfer case assembly, or transmission only in the case of 2wd vehicles.

WARNING: perform these procedures only if you have advanced mechanical knowledge. Certain aspects such as the definition of common tools or how to use them will not be within the pages of this manual. Before attempting any of these procedures on your Pathfinder be aware that this is a labor intensive and time consuming operation; your vehicle will be out of commission for days if not weeks. Parts of this operation will require the assistance of a helper.

Model designation is for 4x4 1996-1999 models, but most of the instructions will cross over to 2wd and the later 1999.5-2004 years

Notice: 2001 and later models require a different transmission than earlier models.

Tools Required

3/8" Socket set with metric sizes from 8mm to 19mm
1/2" Socket set with metric sizes from 12mm to 27mm
3/8" Ratchet
3/8" Extensions in 3" 6" and 9" lengths
3/8" Universal joint (swivel)
1/2" Ratchet
1/2" Extensions in 3" or longer lengths
1/2" Breaker bar
1/2" Torque wrench
Open ended wrench set from 8mm to 27mm
Hydraulic jack capable of 2 tons
Transmission jack capable of holding 325lbs
Phillips head screw driver set
Standard head (flat head) screw driver set
Blind Hole Puller
Dikes
Pliers (Kline type pliers work well)
Needle nose pliers
Standard size vice grips

Parts List

| Part Description for clutch activation | Part Numbers | Quantity Needed |
|---|---------------------------|-----------------|
| Clutch Pedal Bracket | 46550-0W501- | 1 |
| Brake Pedal and Bracket | 46501-0W000- | 1 |
| Clutch Master cylinder | 30610-0W050- | 1 |
| Clutch to dampener line | 30850-0W000- | 1 |
| Clutch Dampener bolts | 08146-6162G- | 2 |
| Clutch Dampener | 30660-0W000- | 1 |
| Clutch Dampener to passenger fender line | 30851-1W200- | 1 |
| Brake/Clutch transfer block | ???? | 1 |
| Transfer block to Slave Cylinder hose line | 30851-1W211- | 1 |
| Slave Cylinder hose bracket | 50915-0W010- | 1 |
| Slave Cylinder hose bracket bolt | 08156-8161F- | 1 |
| Slave Cylinder hose clip | 46206-2J000- | 1 |
| Slave Cylinder rubber hose | 30855-0W010- | 1 |
| Slave Cylinder banjo bolt copper seals | 46237-A4600- | 2 |
| Slave cylinder banjo bolt | 46356-0E000- | 1 |
| Slave cylinder | 30620-0W020- | 1 |
| Slave cylinder bolts | 08121-0251E- | 2 |
| Driveline Parts | | |
| Clutch kit (clutch, pressure plate, throw out bearing) | NU31214-1 (AutoZone part) | 1 |
| Throw out bearing support | 30501-1C100- | 1 |
| throw out bearing control arm | 30531-01S00- | 1 |
| throw out bearing control arm boot | 30542-75P00- | 1 |
| transmission | 32010-0W020- | 1 |
| transmission isolator (mount) bolts (bottom) | 11258-D0101- | 2 |
| transmission isolator (mount) | 11320-1W200- | 1 |
| Transmission bolts (top) | 11393-0W000- | 8 |
| bell housing bolts M10 1.50 60-80mm | 01121-06291- | 8 |
| Flywheel | 12310-0W000- | 1 |
| Flywheel bolts M10 1.00 30mm | 12315-D0210- | 6 |
| Pilot bearing | 32202-B9500- | 1 |
| Transmission shifter | 32839-62G00- | 1 |
| Transmission shifter knob | 32865-50Y00- | 1 |
| Interior pieces | | |
| Inspection hole cover | 74810-0W000- | 1 |
| Body to transfer case and transmission mount with boots | 74967-0W020- | 1 |
| Outer rubber boot with mount | 74910-0W010- | 1 |
| Finisher console with boot | 96934-0W010- | 1 |
| Electronic pieces | | |
| ECM for Manual transmission | 23710-1W600- | 1 |

Section 1: Automatic Transmission



Fig. 1.1 Automatic transmission and Wiring Harness

Removing the Automatic Transmission

Before starting this procedure drain the automatic transmission fluid and transfer case fluid (4wd models). It's important to dispose of all fluids at an authorized recycling center.

1. Remove the negative battery cable.
2. Remove the crankshaft position sensor. It is located on the top driver's side of the bell housing.
3. Remove exhaust tubes from the catalytic converters all the way back.
4. Unbolt and remove the fluid change pipe from the engine and transmission.

In order for the fluid change pipe to clear the engine completely remove the automatic transmission.

5. Remove the oil cooler lines from the transmission and plug all open transmission holes.
6. Remove transfer control linkage on the driver side rear of the transmission. (4wd models only)
7. Remove front (4wd only) and rear driveshaft.
8. Remove the transmission control cable.
9. Remove the passenger side exhaust heat shields.
10. Disconnect the wiring harnesses from the transmission located at the rear passenger side.
11. Remove the starter wires and then the starter.
12. Remove both engine gussets
13. Remove the lower splash shield.
14. Remove the bolts securing the torque converter to drive plate.

Access the torque converter bolts through the starter hole. (see illustration)

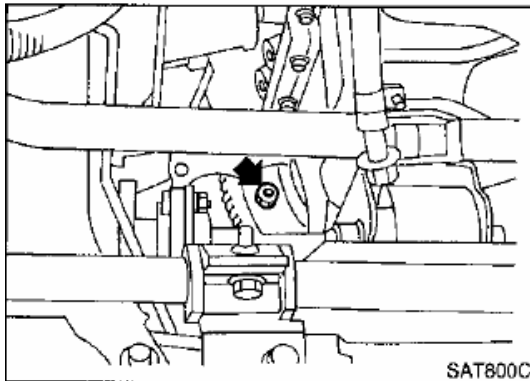


Fig 1.2 Torque converter bolts through starter hole.

15. Remove remaining bell housing bolts.

16. Check to make sure you have removed all wires and cables from the transmission.
17. Support the automatic transmission with the transmission jack
18. Remove the transmission cross member.
19. Lower the automatic transmission with transfer case (4wd models).
Warning: Be careful not to let the torque converter slide off.

Removing the Interior Panels

1. Remove the ashtray. Remove the screw under the ashtray and pull out the bezel that covers the automatic transmission shifter.
2. Remove all screws holding the center console and lift it up. Under the rear of the console unplug the rear power outlet connection.
3. Remove the automatic transmission cable on the passenger side of the automatic transmission shifter.
4. Remove the plate that the automatic transmission cable passes through and completely remove the automatic transmission cable.
5. Remove the climate control/radio bezel's screws at the bottom then pull out.
6. Remove the lower center console piece.
7. Remove the automatic transmission shifter.
8. Remove the transfer case boot from the transmission tunnel plate (4wd models).
9. Remove the transmission tunnel plate.

Section 2: Electrical

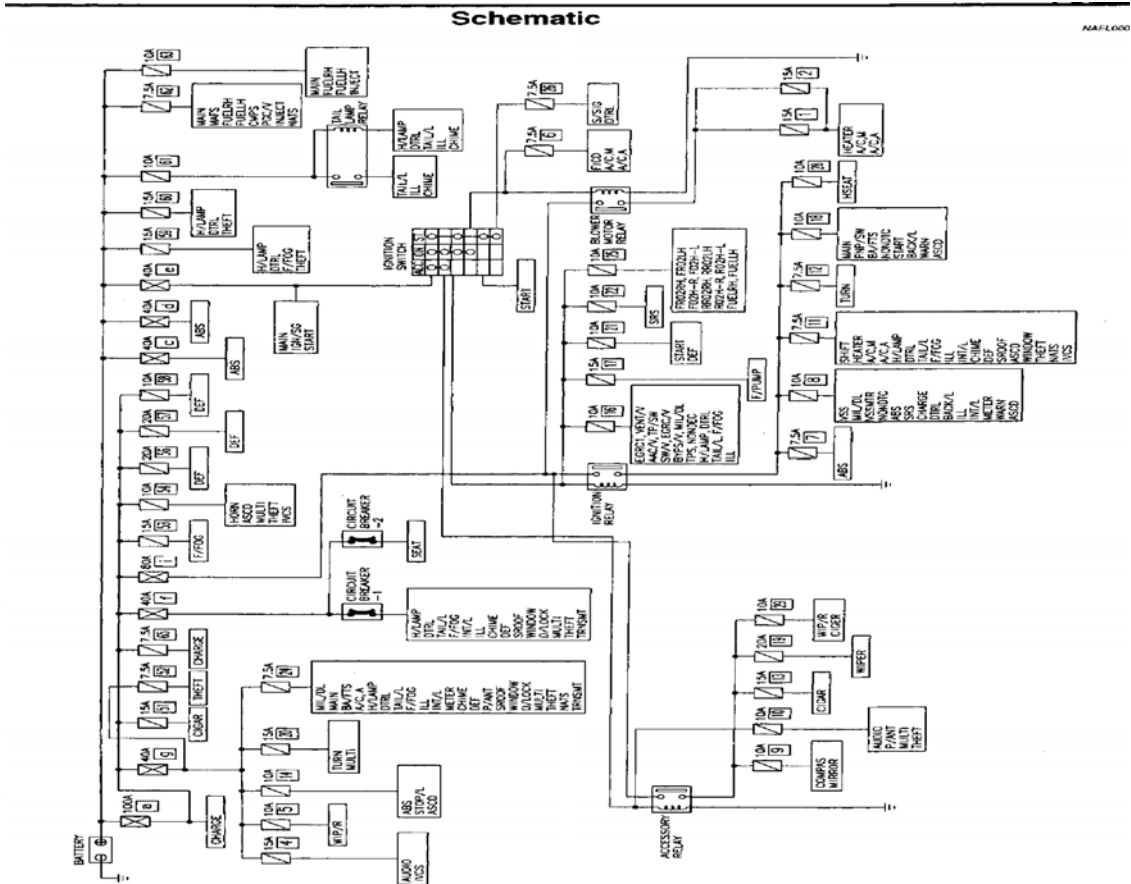


Fig. 2.1 Power Supply Routing

Electronic Control Module Replacement

Information about the Nissan ECM: There are several year breaks in the Pathfinder model line. Below is a listing of ECM part numbers and the month/year that part number applies to.

| Build Date | Part Number |
|------------|--------------|
| 1095-0796 | 23710-0W000- |
| 0796-1296 | 23710-1W201- |
| 1296-0797 | 23710-1W203- |
| 0797-0398 | 23710-1W600- |
| 0398-0998 | 23710-1W602- |
| 0998-1298 | 23710-1W608- |
| 1298-0999 | 23710-2W601- |
| 0999-0100 | 23710-2W602- |

The above parts list only applies to vehicles with the VG33 motor and FED emissions.

1. Make sure the negative battery cable is disconnected.
2. Remove the existing ECM from under the dash above the accelerator pedal. It's easiest to remove the plastic panel under the steering column.
3. Using a 10mm socket unbolt the ECM's electrical connector and unplug.
4. Plug in the electrical connector to the new ECM and tighten the 10mm bolt.
5. Reinstall the ECM.

The date of manufacture for your vehicle can be located on the stamp inside of the driver door jam.

ASCD and Park Neutral Switch Conversion

(Automatic speed control device)

Notice: Make sure to follow these instructions or the truck will not start.

1. Locate the park neutral relay.

96 and some 97 models

In some 97 and earlier vehicles it is located in the driver side relay box in the engine compartment and is labeled N*P. Remove the N*P relay and cross connections 6 to 7 and 3 to 4.

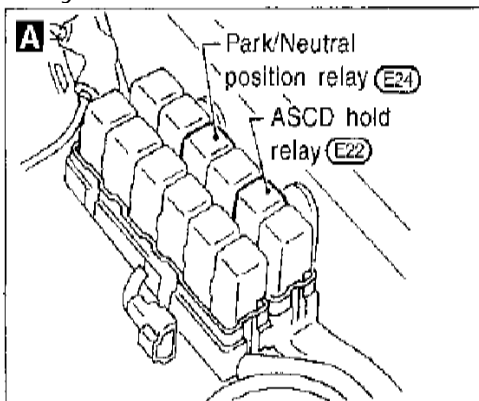


Fig. 2.2 Relay assembly, 96 model shown.

98 and later models

In some 98 and later vehicles the relay is located in the passenger relay box in the engine compartment and is labeled N*P. Remove the N*P relay and cross connections 6 to 7 and 3 to 4.

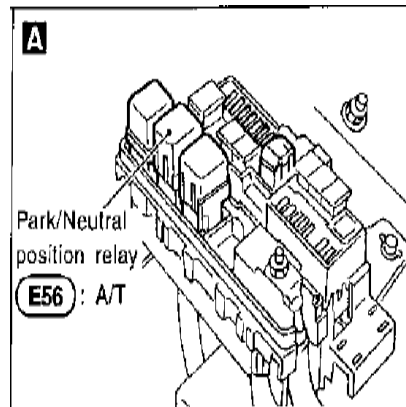


Fig. 2.3 Relay assembly, 97 and later.

Section 3: Clutch



Fig 3.1 Clutch kit from AutoZone

Installing the Clutch activation system

This section deals with tight spaces under the dash and in the engine compartment. All items we are installing either use fasteners from the item they replace or there are already unused mounts in the vehicle.

WARNING: DO NOT ROTATE THE STEERING WHEEL WHILE DISCONNECTED!

1. Remove trim under steering column.
2. Remove Steering column trim
3. Remove Steering column
4. Remove and unplug automatic brake pedal assembly. (4 12mm nuts and one bolt)
5. Install smaller brake pedal assembly and plug in.
6. Remove Automatic computer and unplug, push firewall hole cover out.
7. Install clutch master cylinder from engine compartment and push mounting bolts through firewall holes.
8. Install clutch pedal bracket on master cylinder bolts that went through the firewall and install nuts. One bolt also attaches to the top of the clutch pedal assembly.

1. Install the clutch dampener on the driver's side fender well and the clutch master cylinder to clutch dampener line. (fig. 1.1)



Fig. 3.2 Clutch Dampener



Fig. 3.3 Clutch transfer block, passenger Fender.

2. Remove the passenger side inner fender splash shields.

3. Remove the top most brass brake distribution block and bracket.
Fig 1.2
4. Loosely install the new brake/clutch distribution block and loosely reinstall all brake lines.
3. Install clutch line (part number 30851-1W200) across the firewall. It is easiest to feed this line down on the passenger side and into the new distribution block (fig 1.2).
4. Loosely thread the line into the distribution block and then secure it along the firewall and thread it into the clutch dampener.
5. Once you have the distribution block and the firewall clutch line installed you may tighten all lines and brackets.

Clutch Installation

Warning: Do not allow grease to contaminate the clutch surface.

1. Remove the drive plate by having a helper keep the crankshaft from turning while you remove the drive plate bolts.
2. Inspect the crankshaft mounting surface and make sure no debris are in the thread holes.
3. Remove the pilot adapter for the automatic transmission using the blind hole puller. The blind hole puller is available at auto part stores.

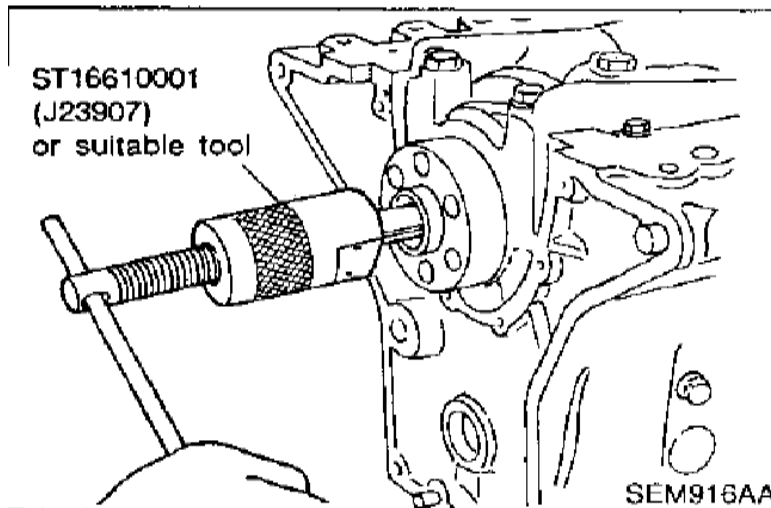


Fig. 3.4 Blind hole puller tool.

4. Install the new pilot bushing into the crankshaft.

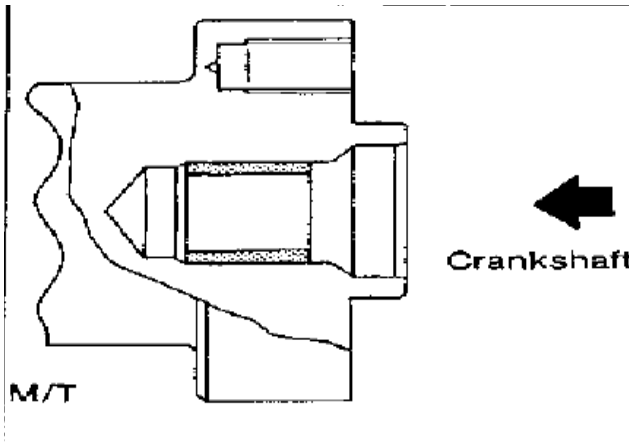


Fig. 3.5 Pilot bearing installed in crankshaft.

5. Place the flywheel on the crankshaft mount and install the new crankshaft bolts. (part 12315-D0210)



Fig. 3.6 Flywheel installed.

6. Apply grease to clutch splines.
7. Install the clutch with tool springs facing outward.
8. Install the pressure plate and bolts.
9. Tighten pressure plate bolts in a two step numerical order. (see illustration) For the first step use 7-14 ft-lbs of torque. For the second step use 16-22 ft-lbs of torque.

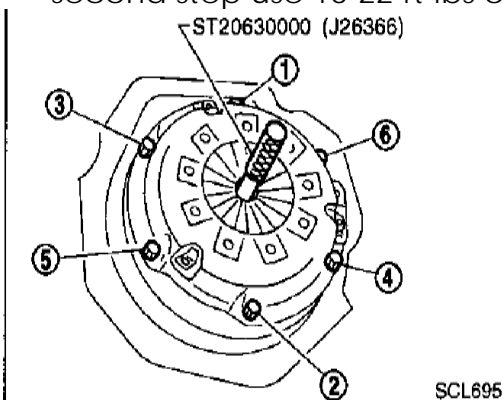


Fig. 3.7 Clutch pressure plate torque sequence.

Section 4: Manual Transmission



Fig. 4.1 FS5R30A and TX-10 Assembly

Manual transmission wiring

Before installing the manual transmission you need to make sure the neutral, reverse, 4x4 high and 4x4 low switches are in working order.

1. To test the reverse switch simply put the transmission in reverse and check continuity, any other position should not have continuity.
2. To test the neutral switch leave the transmission in neutral and test for continuity, any other position should not have continuity.
3. To test the 4x4high put the transfer case in 4x4 high and test for continuity, any other position should not have continuity.
4. To test the 4x4 low put the transfer case in 4x4 low and test the switch for continuity, any other position should not have continuity.

Once you have tested all of the applicable switches install new wires to the existing plugs as indicated below.

1. On the automatic transmission split the wiring loom apart starting at the connections end.
2. Separate each wiring bundle from the others.



Fig. 4.2 Large plug



Fig. 4.3 Automatic Transmission position switch

3. The transmission position switch and its wiring harness is the device you will need to remove from the automatic. 8mm bolts attach the automatic transmission position switch. (Fig. 4.2)

The automatic position switch consists of 9 wires and two plugs. The two large wires which are colored brown and black go to their own plug. The rest of the wires go to another plug.

4. Cut all of the wires from the automatic position switch off at the switch.
5. Leave the wires attached to their plugs.
6. Set aside the plug with the two large brown and black wires, you will use this later.
7. Take the black and green wire from the other plug with many wires and solder them to the wires coming off the reverse switch on the manual transmission
8. After installing the manual transmission this plug can attach to the existing wiring.
9. Take the plug with the two large brown and black wires and solder it to the neutral position switch.

Installing the Manual Transmission

1. Support the manual transmission with transfer case (4wd models) on the transmission jack. Leave the transmission in 4th gear and the transfer case in 4wd high (4wd models).
2. Remove the transmission and transfer case (4wd models) shifters before installing the manual transmission in the truck.
3. Apply sealant to the bell housing as shown in the diagram from the Nissan Factory Service Manual below.

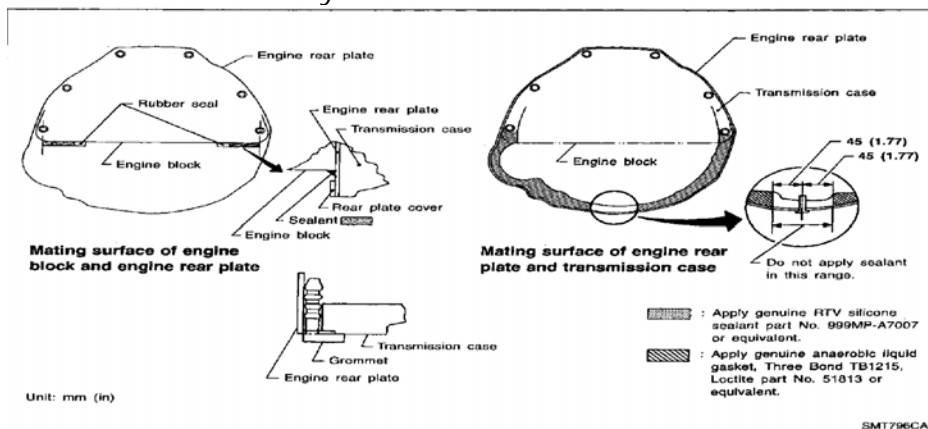
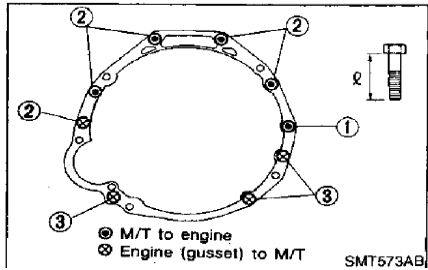


Fig. 4.4 Bell housing sealant instructions

4. Make sure you have removed the clutch alignment tool from the clutch.
5. Lift the transmission and work it into the engine, you can use your hand to turn the front transfer case output shaft to help align the clutch splines with the input shaft splines (4wd model).
6. Use the diagram from the Nissan Service Manual below for bolt torque sequence.

Don't forget to use your new bell housing bolts!!!



● Tighten bolt securing transmission.

| Bolt No. | Tightening torque N-m (kg-m, ft-lb) | ℓ mm (in) |
|------------------|-------------------------------------|-----------|
| 1 | 39 - 49 (4.0 - 5.0, 29 - 36) | 65 (2.56) |
| 2 | 39 - 49 (4.0 - 5.0, 29 - 36) | 58 (2.28) |
| 3 | 29 - 39 (3.0 - 4.0, 22 - 29) | 25 (0.98) |
| Gusset to engine | 29 - 39 (3.0 - 4.0, 22 - 29) | 20 (0.79) |

Fig. 4.5 Bell housing bolt pattern and bolt torque information

7. Refer to section 11 for information on converting the automatic transmission mount to work on the manual transmission.
8. Reinstall the transmission cross member.
9. Reinstall the front (4wd models) and rear drive shaft.
10. Reinstall the starter and wiring.
11. Plug in all electrical connections.
12. Reinstall any other items not mentioned.

Interior Reinstallation

1. Reinstall the transmission and transfer case (4wd models) shifters.
2. Install the new outer manual transmission tunnel cover. (part number 74967-0W020)



Fig 4.6 Transmission Tunnel Covers Fig 4.7 Tunnel Covers Assembled

3. Install the inner transmission tunnel cover with boots. (part number 74910-0W010)
4. Reinstall all interior components removed.
5. Install the new outer shifter cover. (part number 74910-0W010)

Motor Mount Conversion

1. Re-drill the top holes as shown below to convert the motor mount.



Fig. 4.8 Automatic Transmission motor mount red-drilled for Manual Transmission.

Illustrations List

Figure 1.1 Automatic Transmission

Figure 1.2 Torque converter bolts through starter hole.

Figure 2.1 Power Supply Routing

Figure 2.2 Relay Assembly, 96 model shown.

Figure 2.3 Relay Assembly, 97 and later.

Figure 3.1 Clutch kit from AutoZone

Figure 3.2 Clutch Dampener

Figure 3.3 Clutch transfer block, passenger

Figure 3.4 Blind hole puller tool.

Figure 3.5 Pilot bearing installed in crankshaft

Figure 3.6 Flywheel installed.

Figure 3.7 Clutch pressure plate torque sequence.

Figure 4.1 FS5R30A and TX-10 Assembly

Figure 4.2 Large plug

Figure 4.3 Automatic Transmission position switch

Figure 4.4 Bell housing sealant instructions

Figure 4.5 Bell housing bolt pattern and bolt torque information

Figure 4.6 Transmission Tunnel Covers

Figure 4.7 Tunnel Covers Assembled

Figure 4.8 Automatic Transmission motor mount red-drilled for Manual Transmission.