

TRANSMISSION SERVICING - A/T

ABC123

Entire Article
2000 Chevrolet Camaro

ARTICLE BEGINNING

2000-01 TRANSMISSION SERVICING
General Motors Automatic transmission - Cars

MODEL IDENTIFICATION

MODEL IDENTIFICATION

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Body Code (1)	Model
"C"	Park Avenue
"E"	El dorado
"F"	Camaro & Firebird
"G"	Aurora
"H"	Bonneville & LeSabre
"J"	Cavalier & Sunfire
"K"	DeVille & Seville
"M"	Metro
"N"	Alero, Grand Am & Malibu
"S"	Prius
"V"	Catera
"W"	Century, Grand Prix, Impala Intrigue, Lumina, Monte Carlo & Regal
"Y"	Corvette
"Z"	Saturn

(1) - Vehicle body code is fourth character of VIN.
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APPLICATION

Vehicle model is identified by fourth character of Vehicle Identification Number (VIN). See MODEL IDENTIFICATION. VIN is stamped on metal pad on top of left end of instrument panel, near windshield. For transmission application, see AUTOMATIC TRANSAXLE/TRANSMISSION APPLICATIONS table.

AUTOMATIC TRANSAXLE/TRANSMISSION APPLICATIONS

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Application	Trans. Model (RPO Code)
Buick	
Century	4T65-E (M15)
LeSabre	4T65-E (MN3 Or M15)
Park Avenue	4T65-E (MN3 Or MN7)
Regal	4T65-E (M15 Or MN7)
Cadillac	
Catera	4L30-E (ML4)
DeVille	4T80-E (MH1)
El dorado	4T80-E (MH1)

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Seville	4T80-E (MH1)
Chevrolet	
Camaro	4L60-E (M30)
Cavalier	
2.2L	3T40 (MD9) Or 4T40-E (MN4)
2.4L	4T40-E (MN4)
Corvette	4L60-E (M30)
Impala	
3.4L	4T65E (M15)
3.8L	4T65E (M15)
Lumina	4T65-E (M15)
Malibu	4T40-E (MN4)
Metro	(1) ECC 3-Speed (M60)
Monte Carlo	
3.4L	4T65-E (M15)
3.8L	4T65-E (M15)
Priem	(2) A-131L (MB3) Or A-245E (M57)
Oldsmobile	
Alero	
2.4L	4T40-E (MN4)
3.4L	4T45-E (MN5)
Aurora	
3.5L	4T65E (MN3)
4.0L	4T80-E (MH1)
Intrigue	4T65-E (MN3)
Pontiac	
Bonneville	4T65-E (MN3, MN7 Or M15)
Firebird	4L60-E (M30)
Grand Am	
2.4L	4T40-E (MN4)
3.4L	4T45-E (MN5)
Grand Prix	
3.1L	4T65-E (M15)
3.8L	4T65-E (MN7 Or M15)
Sunfire	
2.2L	3T40 (MD9) Or 4T40-E (MN4)
2.4L	4T40-E (MN4)
Saturn	
1.9L	MP6 Or MP7
2.2L	4T40E
3.0L	4T40E

- (1) - Transaxle is manufactured by Suzuki. For overhaul and electronic diagnosis of this transaxle, see appropriate article in TRANSMISSION SERVICE & REPAIR for IMPORTED VEHICLES.
- (2) - Transaxle is manufactured by Toyota. For overhaul and electronic diagnosis of this transaxle, see appropriate article in TRANSMISSION SERVICE & REPAIR for IMPORTED VEHICLES.

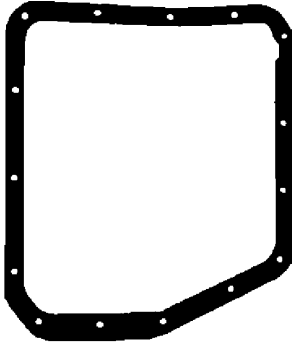
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OIL PAN GASKET IDENTIFICATION

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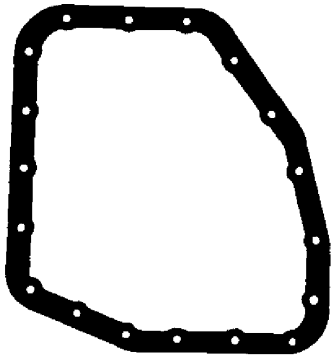
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NOTE: Refer to appropriate illustration for oil pan gasket identification. See Figs. 3-10.



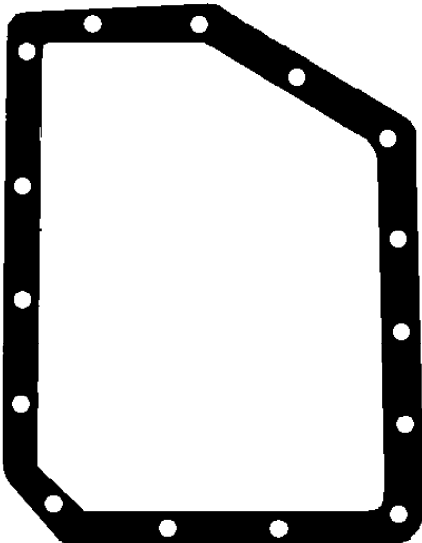
G99H03709

Fig. 1: Identifying A-131L Oil Pan Gasket



G99A03701

Fig. 2: Identifying A-245E Oil Pan Gasket

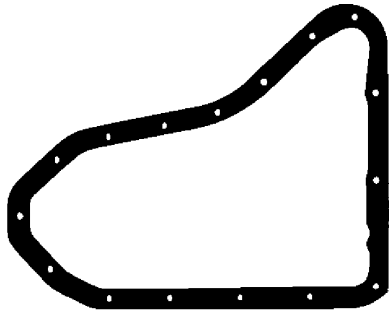


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Fig. 3: Identifying ECC 3-Speed Oil Pan Gasket

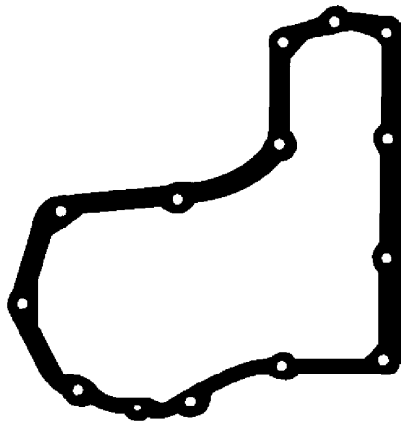
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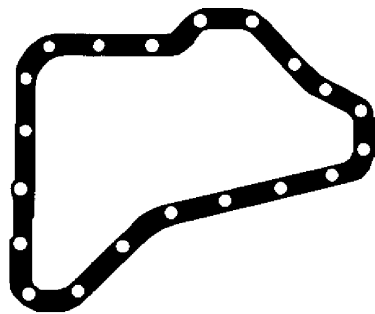
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Fig. 4: Identifying Hydra-Matic 3T40 Oil Pan Gasket



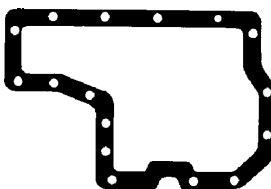
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Fig. 5: Identifying Hydra-Matic 4T40-E & 4T45-E Oil Pan Gasket



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Fig. 6: Identifying Hydra-Matic 4T65-E Oil Pan Gasket

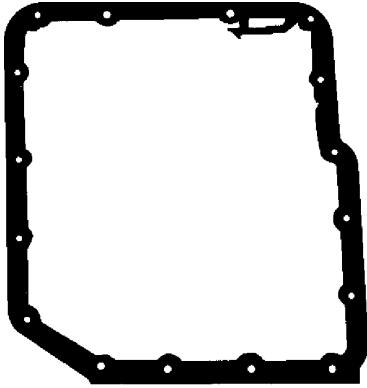


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Fig. 7: Identifying Hydra-Matic 4T80-E Oil Pan Gasket

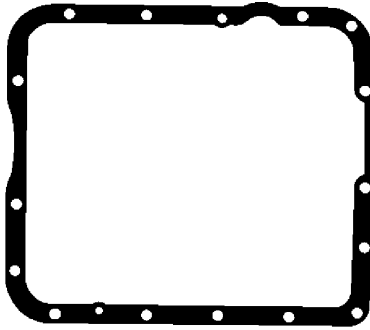
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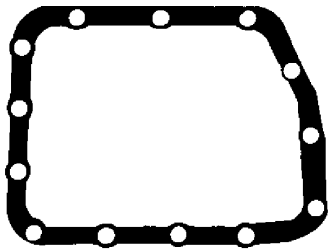
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Fig. 8: Identifying Hydra-Matic 4L30-E Oil Pan Gasket



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Fig. 9: Identifying Hydra-Matic 4L60-E Oil Pan Gasket



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Fig. 10: Identifying Saturn MP6/MP7 Oil Pan Gasket

LUBRICATION

NOTE: The 4T40-E, 4T45-E, 4L30-E and 4L60-E ("Y" body) transaxles/transmissions are not equipped with a dipstick.

SERVICE INTERVALS

NOTE: Driver Information Display CHANGE TRANS FLUID message may be displayed on some models. If CHANGE TRANS FLUID message is displayed, see DRAINING & REFILLING. On Eldorado, to reset message, press and hold OFF and REAR DEFOG buttons until

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TRANS FLUID RESET appears in Information Center (5-20 seconds). On all other models, press and hold INFO RESET button until display reads 100% TRANS FLUID LIFE.

All Models With 4T40-E, 4T45-E, 4L30-E, & 4L60-E ("Y" Body) Transaxles/transmissions are not equipped with transaxle fluid dipstick. Check transmission fluid level only when leaks have occurred. Under continuous extreme operating conditions (trailer towing, heavy city traffic with ambient temperature more than 90°F (32°C) or delivery service), fluid and filter should be changed every 50,000 miles.

Camaro & Firebird

Check transmission fluid level at every engine oil change. Transmission fluid and filter should be changed under normal operating conditions every 50,000 miles. Under continuous extreme operating conditions (trailer towing, heavy city traffic with ambient temperature more than 90°F (32°C) or delivery service), fluid and filter should be changed every 15,000 miles.

Metro

Check fluid at every engine oil change. Replace transaxle fluid and clean filter and pan magnet every 100,000 miles under normal operating conditions. Change fluid and clean filter and pan magnet every 50,000 miles under severe driving conditions.

Pri z m

Check fluid at every engine oil change. Transmission fluid should not be changed under normal operating conditions. Under continuous extreme operating conditions (trailer towing, heavy city traffic with ambient temperature more than 90°F (32°C) or delivery service), replace transaxle and differential fluid and filter every 15,000 miles.

Saturn

Check fluid at every engine oil change. Transmission fluid should not be changed under normal operating conditions. Under continuous extreme operating conditions (trailer towing, heavy city traffic with ambient temperature more than 90°F (32°C) or delivery service), replace fluid and filter every 50,000 miles.

All Other Models

Check transmission fluid level at every engine oil change. Transmission fluid should be changed under normal operating conditions at 100,000 miles. Under continuous extreme operating conditions (trailer towing, heavy city traffic with ambient temperature more than 90°F (32°C) or delivery service), fluid and filter should be changed every 50,000 miles.

CHECKING FLUID LEVEL

CAUTION: DO NOT overfill. When transmission is cold, fluid level will

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rise from minimum level to maximum level on dipstick as transmission reaches normal operating temperature.

CAUTION: If vehicle has been driven for an extended period of time at high speeds, in city traffic, in hot weather or if vehicle has been pulling a trailer, an accurate fluid level reading cannot be made until vehicle has been parked and ATF is allowed to cool for about 30 minutes.

NOTE: The 4T40-E, 4T45-E, 4L30-E and 4L60-E ("Y" body) transaxles/transmissions are not equipped with a dipstick.

4L30-E & 4L60-E ("Y" Body)

1) Fluid level must be checked with transmission fluid at normal operating temperature. Start engine and place gear selector in Park. Raise and support vehicle. With engine running at idle, remove fill plug from side of transmission pan and check fluid level.

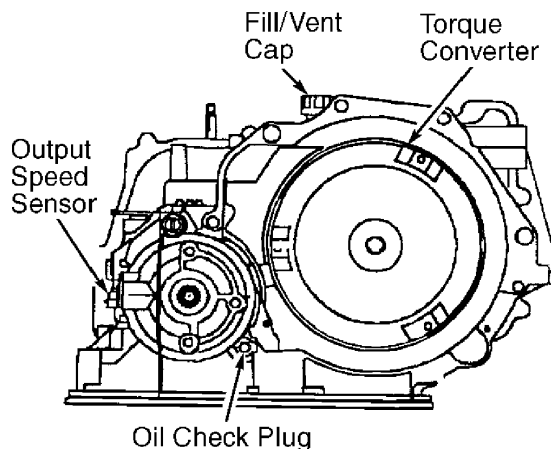
2) Fluid level should be even with bottom of fill plug hole. Adjust fluid level as necessary. Use an oil suction gun to add fluid. If fluid level is low, add fluid in one pint increments. Install fill plug and tighten to specification. See TORQUE SPECIFICATIONS.

4T40-E & 4T45-E

1) Fluid level must be checked with transmission temperature of at least 104°F (40°C). To obtain proper temperature, run engine at idle for 3-5 minutes. Shift through each gear range, holding in each range for 3 seconds.

2) Place gear selector in Park. Leave engine running. Raise and support vehicle. Place oil drain pan below oil check plug. Oil check plug is located in center of transaxle above pan rail, on torque converter side. See Fig. 11. Remove oil check plug.

3) Oil level should be even with bottom of oil check plug hole. If fluid does not drain from hole, add fluid until fluid starts to pour from hole. Tighten oil check plug to 106 INCH lbs. (12 N.m).



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Fig. 11: Locating 4T40-E & 4T45-E Oil Check Plug
Courtesy of General Motors Corp.

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All Other Models

1) Start engine. Operate vehicle for at least 15 minutes or until operating temperature is reached. With engine at idle and vehicle on level ground, move gear selector lever through all ranges, ending in Park.

2) Remove transmission dipstick, wipe clean and fully reinsert into filler tube. Remove dipstick again, and inspect fluid level. Fluid level should be between ADD 1 PT. or .5L mark and FULL HOT mark, between COLD and HOT mark, or within cross-hatched area on dipstick, depending on model application.

RECOMMENDED FLUID

Manufacturer recommends Dexron-III ATF.

FLUID CAPACITIES

TRANSAXLE/TRANSMISSION FLUID CAPACITIES (1)

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Application	Drain & Refill (2) - Qts. (L)	Overhaul - Qts. (L)
A-131L 3-Speed	2.6 (2.5)	5.8 (5.5)
A-245E 4-Speed	1.6 (1.5)	5.2 (4.9)
ECC 3-Speed	1.6 (1.5)	3.7 (3.5)
MP6 & MP7	4.2 (4.0)	7.4 (7.0)
3T40	4.0 (3.8)	7.0 (6.6)
4T40-E & 4T45-E (3)	7.0 (6.6)	12.9 (12.2)
4T65-E	7.4 (7.0)	10.0 (9.5)
4T80-E	11.0 (10.6)	15.0 (14.2)
4L30-E	7.0 (6.6)	(3)
4L60-E		
"F" Body	5.0 (4.7)	11.0 (10.6)
"Y" Body (3)	5.0 (4.7)	10.8 (10.2)

(1) - Fluid capacities listed are approximate. Always fill to specified area on dipstick (if equipped).

See CHECKING FLUID LEVEL.

(2) - Drain and refill capacity does not include torque converter.

(3) - Transmission is not equipped with a dipstick. Fill to bottom of oil check plug hole.

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DRAINING & REFILLING

NOTE: Some transmissions are equipped with a reusable-type oil pan gasket. Reusable oil pan gasket is constructed of rubber with metal or plastic backing. On transmissions equipped with reusable-type gasket, sealing surface of oil pan is flat. Transmissions not equipped with reusable-type gasket have a ridge on sealing surface of oil pan. Clean reusable gasket

with solvent. Inspect reusable gasket for damage and replace as necessary. Using any other type of gasket in place of reusable-type gasket may result in fluid leaks.

NOTE: If oil pan bolts are equipped with conical washers, DO NOT reuse bolts if washers have become reversed. See Fig. 12.

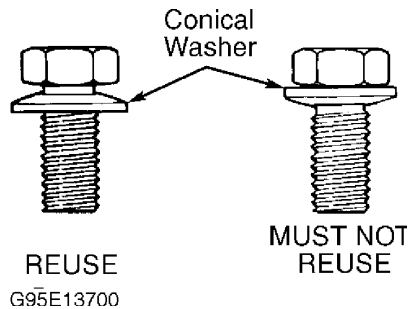


Fig. 12: Identifying Conical Washers
Courtesy of General Motors Corp.

Metro

1) Remove drain plug from bottom of transaxle oil pan and drain fluid. Remove oil pan bolts, oil pan, oil pan guard, gasket and filter screen. Note position of 2 cross-grooved oil pan bolts. See Fig. 13. If oil pan is stuck to transaxle case, use rubber mallet and wood block to remove it. DO NOT pry oil pan away from case.

2) Install clean filter screen and NEW gasket. Tighten retaining bolts to 53 INCH lbs. (6 N.m). Install oil pan and NEW gasket. Apply thread sealant to threads of 2 cross-grooved bolts. DO NOT apply thread sealant to remaining bolts. Tighten oil pan bolts to 53 INCH lbs. (6 N.m). Tighten drain plug to 17 ft. lbs. (23 N.m).

3) Add correct amount of transaxle fluid through dipstick tube. See FLUID CAPACITIES.

4) With gear selector lever in Park and parking brake applied, start engine and check fluid level. See CHECKING FLUID LEVEL. Add fluid as necessary.

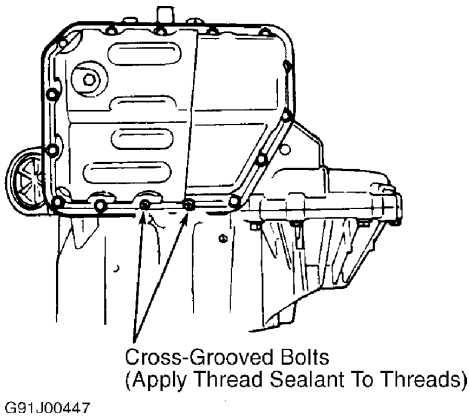


Fig. 13: Identifying Oil Pan Bolts (Metro)
Courtesy of General Motors Corp.

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Prizm (3-Speed Transaxle)

1) Raise and support vehicle. Remove left splash shield. Remove drain plug and drain fluid. Remove oil pan bolts, oil pan and gasket. If oil pan is stuck to transaxle case, use a rubber mallet and wood block to remove it. DO NOT pry oil pan away from case. Remove filter screen bolts and filter screen, noting length and position for reassembly reference.

2) Install clean filter screen and NEW gasket. Ensure bolts are installed in original locations. Tighten filter screen bolts to 89 INCH lbs. (10 N.m). Install oil pan using NEW gasket. Tighten bolts to 43 INCH lbs. (4.9 N.m). Install drain plug and tighten to 17 ft. lbs. (23 N.m). Install left splash shield and tighten bolts to 44 INCH lbs. (5 N.m). Add correct amount of transaxle fluid through dipstick tube. See FLUID CAPACITIES.

3) With gear selector lever in Park and parking brake applied, start engine and check fluid level. See CHECKING FLUID LEVEL. Add fluid as necessary.

Prizm (4-Speed Transaxle)

1) Raise and support vehicle. Remove left splash shield. Remove drain plug from oil pan and drain fluid. Remove oil pan bolts, oil pan protector, oil pan and gasket. If oil pan is stuck to transaxle case, use rubber mallet and wood block to remove it. DO NOT pry oil pan away from case. Remove filter screen and gasket.

2) Install clean filter screen and NEW gasket. Tighten filter screen bolts to 89 INCH lbs. (10 N.m). Install oil pan, NEW gasket and oil pan protector. Tighten oil pan bolts to 43 INCH lbs. (4.9 N.m). Tighten drain plug to 13 ft. lbs. (17 N.m). Install left splash shield and tighten bolts to 44 INCH lbs. (5 N.m). Add correct amount of transaxle fluid through dipstick tube. See FLUID CAPACITIES.

3) With gear selector lever in Park and parking brake applied, start engine and check fluid level. See CHECKING FLUID LEVEL. Add fluid as necessary.

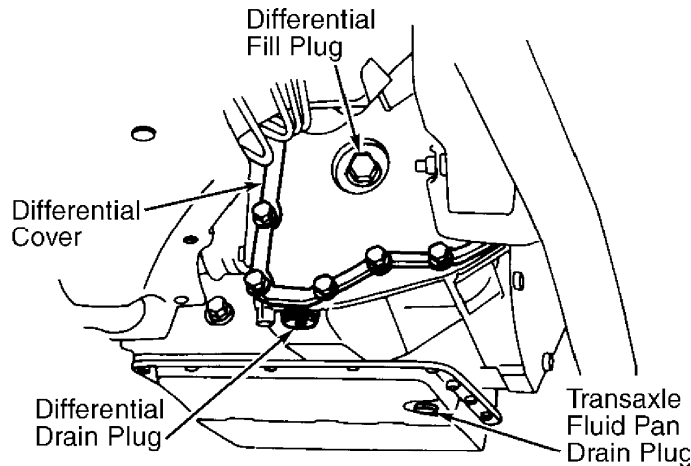
Prizm (Differential - 3-Speed Transaxle)

Remove drain plug in bottom of differential and drain fluid. See Fig. 14. Install drain plug and tighten to 29 ft. lbs. (39 N.m). Remove fill plug on side of differential cover. Fill with Dexron-III ATF until fluid runs out fill hole. Install fill plug and tighten to 29 ft. lbs. (39 N.m).

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Fig. 14: Identifying Differential Fill & Drain Plugs (Prizm 3-Speed Transaxle)
Courtesy of General Motors Corp.

Saturn (MP6 & MP7)

1) Ensure transaxle fluid is at normal operating temperature. Raise and support vehicle. Place drain pan under transaxle. Remove transaxle fluid drain plug. Allow at least 5 minutes for fluid to drain completely.

2) Reinstall drain plug and tighten to 22 ft. lbs. (30 N.m). Lower vehicle and remove air induction system and air filter box. Using filter wrench, remove external spin-on type transaxle oil filter. Remove magnet from old filter, clean magnet and install on NEW filter.

3) Install and tighten transaxle oil filter, following instructions on filter label. Install air filter box and air induction system. Add required amount of fluid to transaxle through filler tube. See FLUID CAPACITIES.

4) With gear selector lever in Park and parking brake applied, start engine and check fluid level. See CHECKING FLUID LEVEL. Add fluid as necessary.

All Models Equipped With 4T40-E, 4T45-E & 4L30-E, & 4L60-E ("Y" Body)

1) Raise and support vehicle. Place drain pan under transmission oil pan. Remove oil pan bolts from front and side. Loosen rear transmission oil pan bolts about 4 turns each.

2) Using a screwdriver, carefully pry pan loose. Allow fluid to drain. Remove bolts, and remove oil pan. Remove and discard old pan gasket, if reusable-type gasket is not used. Remove filter and "O" ring or sleeve-type seal. Remove any remaining gasket material on transmission case.

3) Thoroughly clean pan, magnet and screen (if metal) with solvent, and then dry using compressed air. Replace filter and seal. Lubricate with clean fluid before installation.

4) Install filter assembly into filter pick-up tube recess. Install oil pan and gasket. Use NEW pan gasket if transmission is not

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equipped with reusable-type gasket. Tighten pan bolts to specification. See TORQUE SPECIFICATIONS.

5) Fill transmission to proper level. See FLUID CAPACITIES. Lower vehicle and start engine. Allow engine to idle until transmission fluid reaches 104°F (20°C). Depress brake pedal and shift gear selector through all gear ranges, pausing a few seconds in each range. Place gear selector lever in Park.

CAUTION: In this step, engine MUST be running when transmission oil check plug is removed or excessive fluid loss will occur. Stand clear when removing oil check plug. DO NOT turn engine off with oil check plug removed.

6) With engine running, raise vehicle and remove transmission oil check plug. Add fluid in increments of 1 pint (.5L) until fluid drains from oil check hole. Install oil check plug.

All Other Models

1) Raise and support vehicle. Place drain pan under transmission oil pan. Remove transmission oil pan front and side bolts only. Loosen rear bolts about 4 turns each.

2) Using a screwdriver, carefully pry pan loose. Allow fluid to drain. Remove remaining bolts, and remove oil pan. Remove and discard old pan gasket, if reusable-type gasket is not used. Remove filter and "O" ring or sleeve-type seal. Remove any remaining gasket material on transmission case.

3) Thoroughly clean pan, magnet and screen (if metal) with solvent, and then dry using compressed air. Replace paper filter, if equipped. Install NEW "O" ring on pick-up tube or NEW sleeve into transmission case. Lubricate with clean fluid before installation.

4) Install filter assembly into filter pick-up tube recess. Install oil pan and gasket. Use NEW pan gasket if transmission is not equipped with reusable-type gasket. Tighten pan bolts to specification. See TORQUE SPECIFICATIONS. Add required amount of fluid to transmission through filler tube. See FLUID CAPACITIES.

5) With gear selector lever in Park and parking brake applied, start engine and check fluid level. See CHECKING FLUID LEVEL. Add fluid if necessary. DO NOT overfill.

ADJUSTMENTS

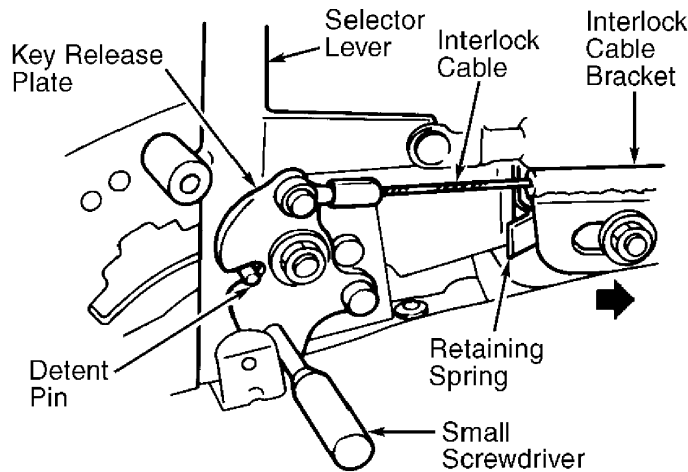
INTERLOCK CABLE (METRO)

NOTE: Interlock system will not allow gear selector lever to move from Park unless ignition is turned on. It also prevents ignition key removal unless gear selector lever is in Park.

1) Remove center console cover and manual selector cover. Place gear selector lever in Park. Loosen interlock cable bolt. Rotate key release plate and insert a small screwdriver into hole in lower key release plate. Retaining spring will move interlock cable bracket into position. Tighten interlock cable bolt to 115 INCH lbs. (13 N.m).

See Fig. 15.

2) Ensure ignition switch operates from ACC to LOCK position, and ignition key can be removed when gear selector lever is in Park. Move gear selector lever to any other position. Ensure ignition switch cannot be turned from ACC to LOCK position. If ignition switch will turn, readjust interlock cable.



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Fig. 15: Adjusting Interlock Cable (Metro)
Courtesy of General Motors Corp.

PARK LOCK CABLE

WARNING: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle. See COMPUTER RELEARN PROCEDURES article in GENERAL INFORMATION.

NOTE: Not all models are equipped with park lock cable. Park lock cable adjustment information for some models is not available from manufacturer. On all vehicles, with gear selector lever in Park and ignition switch in LOCK position, ensure gear selector lever cannot be moved to any other position. Ignition key should be removable.

"F" & "N" Bodies

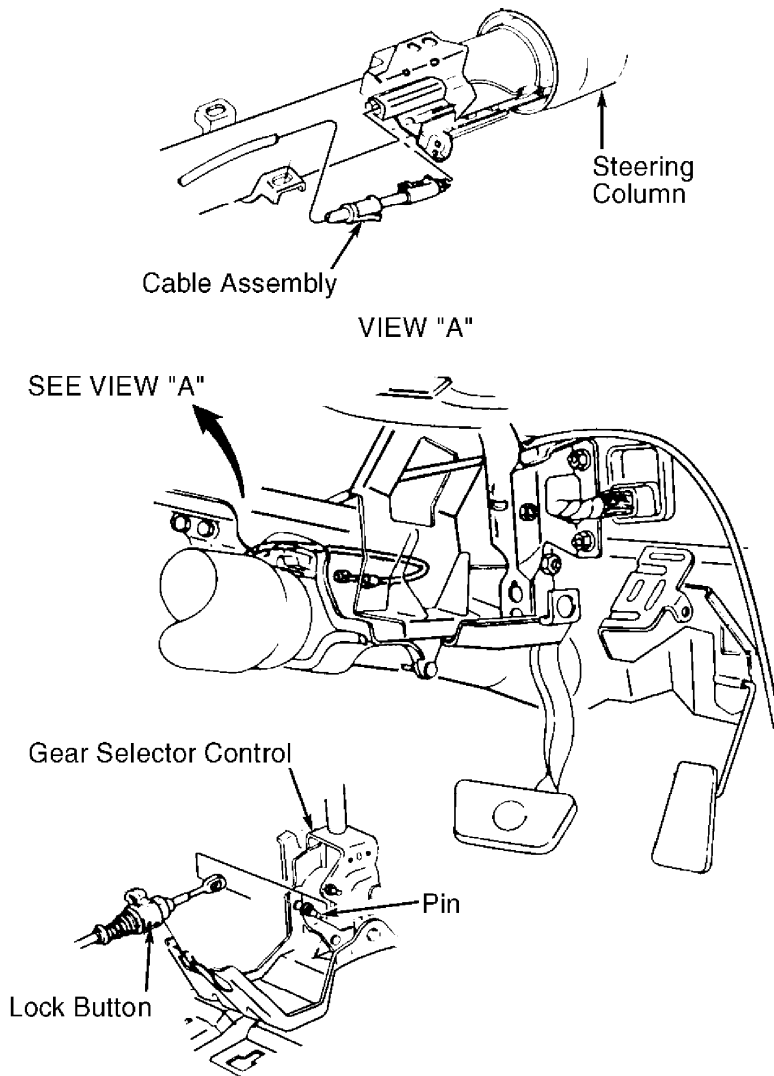
1) With gear selector lever in Park and ignition switch in LOCK position, gear selector lever should not be able to be moved to other gear positions and ignition key should be removable from lock cylinder.

2) With ignition switch in RUN position and gear selector lever in Neutral, ensure ignition switch cannot be turned to LOCK position. If system does not perform as described, unlock park lock cable adjuster lock button (button up). See Fig. 16. Move cable connector nose rearward until key can be removed from ignition. Lock cable adjuster (button down).

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Fig. 16: Adjusting Park Lock Cable ("F" & "N" Bodies)
Courtesy of General Motors Corp.

"E", "G", "H", "K" (Except Seville) & "W" Bodies

1) Remove center console to expose park lock cable connector lock. Place gear selector lever in Park. Turn ignition switch to LOCK position.

2) Pull park lock cable connector lock button up to unlock. Push cable connector nose forward to remove slack. Snap park lock cable connector lock button down into place. Check park lock cable operation.

3) Ensure ignition key can be removed with gear selector lever in Park only, and gear selector lever cannot be moved from Park with ignition switch in LOCK position.

"J" Body

1) With ignition switch in RUN position and gear selector

Lever in Neutral, ensure ignition switch cannot be turned to LOCK position. With gear selector lever in Park and ignition switch in LOCK position, gear selector lever should not be able to be moved to other gear positions and ignition key should be removable from lock cylinder.

2) If system does not perform as described, remove shift console and unlock park/lock cable housing lock at gear selector lever.

3) Turn ignition key to RUN position. Do not start engine. Verify instrument lights are on. Compress cable adjuster body spring and release. Move shift cable lock to lock position. Verify park lock cable adjustment by repeating step 1).

Saturn

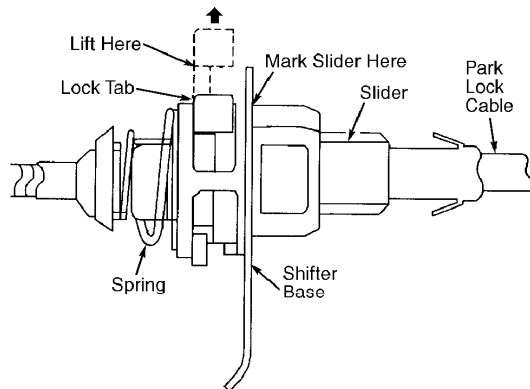
1) Place gear selector lever in Park, and remove key. Remove cup holder/ashtray assembly. Lift lock tab on park lock cable end. See Fig. 17. Depress and release gear selector shift knob quickly 3 times to set starting position of cable. Using a sharp pencil, mark starting position on slider. See Fig. 17.

NOTE: Adjustment may move when lock tab is pushed. Proper operation must be verified prior to reassembly.

2) Using a feeler gauge for adjustment, move park lock cable towards shifter base .049" (1.25 mm). Push lock tab of shift lock cable end to set position.

3) With ignition off and gear selector lever in Park, attempt to move gear selector lever out of Park. Lever should not move. Turn ignition on. Gear selector lever should be allowed to move out of Park. Place gear selector lever in any position except Park and turn ignition off. Ignition key should not be removable. Attempt to place gear selector lever in Park. Gear selector lever should return to Park, and ignition key should be removable.

4) If park lock cable does not operate as specified, readjust cable. Check shift cable adjustment. See SHIFT CABLE (FWD). Install cup holder/ashtray assembly.



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Fig. 17: Locating Park Lock Cable Components (Saturn)
Courtesy of General Motors Corp.

Corvette & Seville

No adjustment is necessary. Replace park lock cable if ignition switch can be turned with gear selector lever in any position except Park, or if selector lever can be moved from Park with ignition switch in LOCK position.

PARK/NEUTRAL POSITION SWITCH

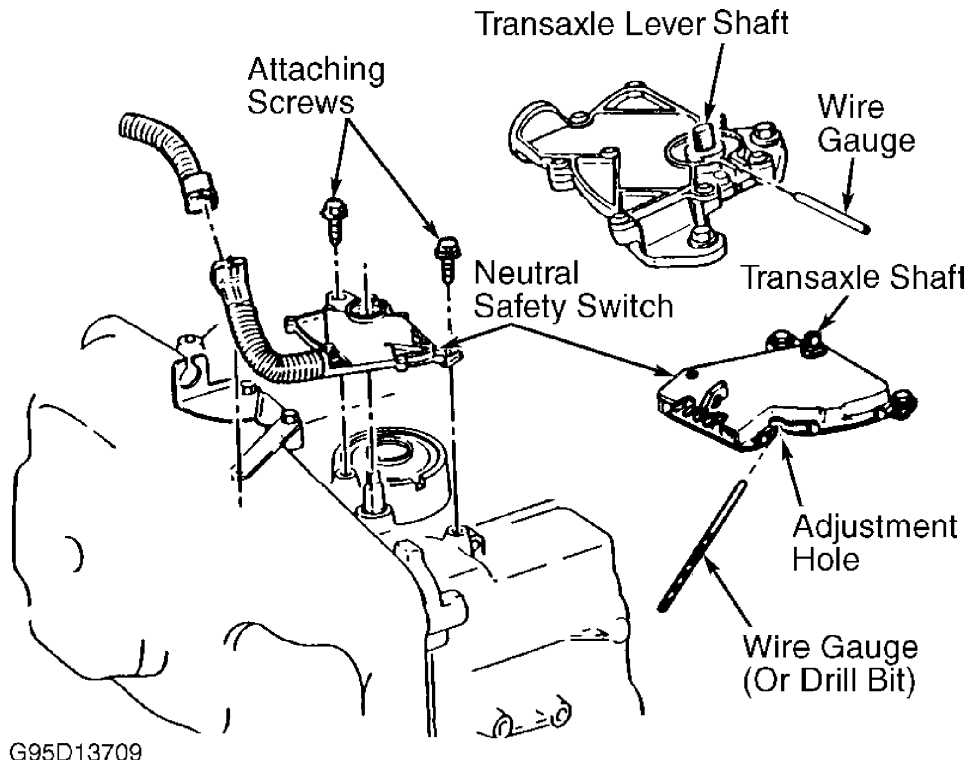
NOTE: Park/Neutral Position (PNP) switch may also be referred to as transmission range switch or neutral safety switch. Adjust switch so engine starts with transmission in Park or Neutral only.

3T40, 4T40E & 4T45E

1) Place gear selector lever in Neutral. Ensure transaxle control lever is in Neutral detent. Loosen PNP switch mounting bolts. Rotate PNP switch on shift shaft to align adjustment hole with carrier tang hole.

2) Insert a 3/32" (2.3 mm) wire gauge about 9/64" (3.6 mm) deep into switch alignment holes. See Fig. 18. Tighten PNP switch mounting bolts to 18 ft. lbs. (24 N.m). Remove wire gauge.

3) NEW PNP switches may have a plastic pin installed in hole. Plastic pin is designed to shear off during initial gear selector lever operation.



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Fig. 18: Adjusting Park/Neutral Position Switch (Typical FWD)
Courtesy of General Motors Corp.

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NOTE: Some models use an internal PNP switch. No adjustment is required with internal PNP switch.

4T65-E & 4T80-E

1) Disconnect shift cable from transaxle control lever.

Remove control lever. Loosen PNP switch mounting bolts. Using Alignment Tool (J-41545), align slots of PNP switch to Neutral position by rotating. See Fig. 19.

2) Tighten PNP switch mounting bolts to 18 ft. lbs. (24 N.m).

Remove alignment tool. Reinstall transaxle control lever. Tighten transaxle control lever nut to 15 ft. lbs. (20 N.m). Reconnect shift cable.

3) Ensure engine starts with transmission in Park or Neutral only. Readjust PNP switch if operation is not as specified.

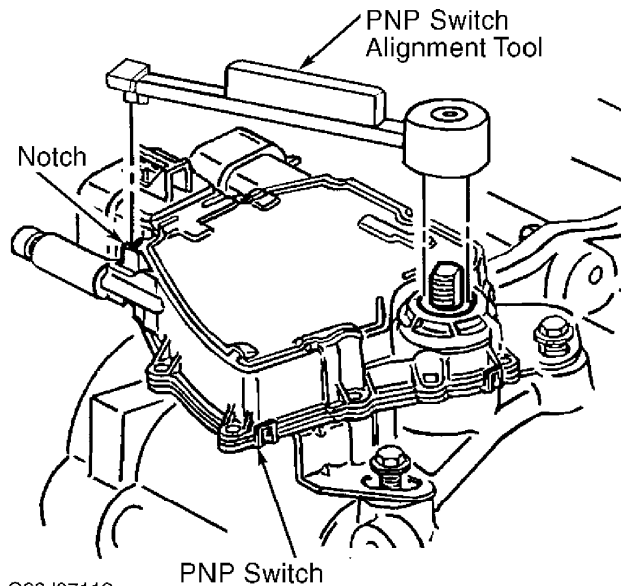


Fig. 19: Adjusting Park/Neutral Position Switch (4T65-E & 4T80-E)
Courtesy of General Motors Corp.

4L30-E

1) Apply parking brake. Place gear selector in Neutral. Raise and support vehicle. Remove cover from PNP switch. Remove nut and lever from switch. Disconnect harness connector from switch.

2) Connect ohmmeter between switch terminals "E" and "H" (Red/Black wires). Loosen PNP switch bolts. Rotate switch slightly in both directions to determine range of electrical contact (about 5 degrees).

3) Position PNP switch in middle of contact range. Tighten PNP switch bolts to 106 INCH lbs. (12 N.m). Install linkages and wiring harness. Tighten selector lever nut to 71 INCH lbs. (71 N.m).

4L60-E ("F" Body)

1) Disconnect negative battery cable. Remove gear selector

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knob and center console cover. Place gear selector lever in Neutral. If old PNP switch is being adjusted, go to next step. If NEW PNP switch is being installed, go to step 4).

2) Align tang on PNP switch with tang slot on shift control. See Fig. 20. Loosen PNP switch mounting nuts. Rotate PNP switch to align service adjustment hole with carrier tang hole.

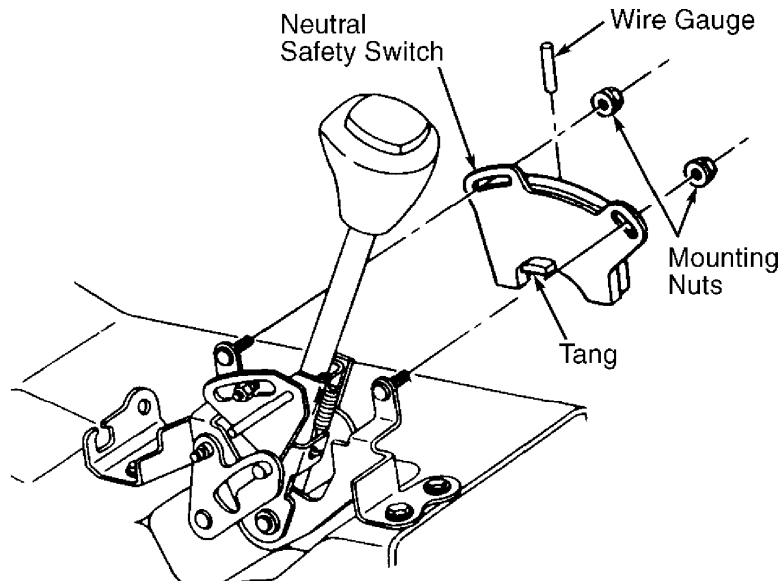
3) Insert a .092" (2.34 mm) wire gauge into adjustment hole in top of PNP switch. Rotate switch until pin drops in to a depth of .59" (15 mm). Tighten PNP switch mounting nuts to 19 INCH lbs. (2.2 N.m). Ensure engine starts with transmission in Park or Neutral only.

4) If a NEW PNP switch is being installed, insert PNP switch tang in slot on shift control. Tighten mounting nuts to 19 INCH lbs. (2.2 N.m).

5) Ensure gear selector lever is in Neutral if holes do not align with shift control. DO NOT rotate switch. Switch is pinned in Neutral.

NOTE: If NEW PNP switch is rotated and pin breaks during installation, use adjustment procedure in step 2).

6) If holes align with shift control, move gear selector lever out of Neutral to shear plastic pin.



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Fig. 20: Adjusting Park/Neutral Position Switch (4L60-E - "F" Body)
Courtesy of General Motors Corp.

4L60-E ("Y" Body)

1) Apply parking brake. Place gear selector lever in Neutral. Raise and support vehicle. Disconnect transmission shift cable from transmission. Remove transmission control lever bracket. Loosen PNP switch mounting screws.

2) Using PNP Switch Alignment Tool (J41364-A), align 2 lower slots on PNP switch with upper slot on PNP switch by rotating switch

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body. See Fig. 21. Tighten PNP switch mounting bolts to 20 ft. lbs. (27 N.m).

3) Install transmission control lever bracket and shift cable. Tighten transmission control lever nut to 15 ft. lbs. (20 N.m). Check PNP switch operation. Ensure engine starts with transmission in Park and Neutral only.

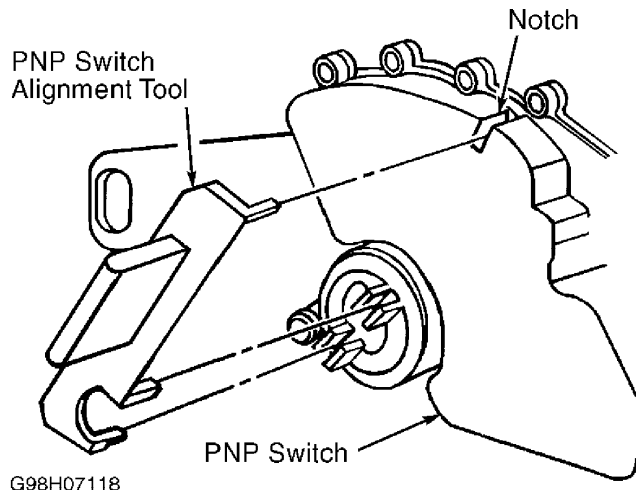


Fig. 21: Adjusting Park/Neutral Position Switch (4L60-E - "Y" Body)
Courtesy of General Motors Corp.

Saturn

Place gear selector lever in Drive. Using an ohmmeter, check for continuity across switch terminals. If continuity does not exist, loosen switch retaining bolts and rotate switch to obtain continuity. Tighten switch retaining bolts to 10 ft. lbs. (14 N.m) and recheck continuity.

Metro

1) Remove PNP switch from vehicle. Place transaxle gear selector lever in "N" position. Using a flat-blade screwdriver, turn PNP switch in either direction until 2 clicks are heard in position shown. See Fig. 22.

2) Install switch to transaxle. Ensure gear selector lever is in "N" position. Tighten switch mounting bolt to 17 ft. lbs. (23. N.m). Set parking brake, block vehicle wheels and ensure engine operates with transaxle in Neutral and Park.

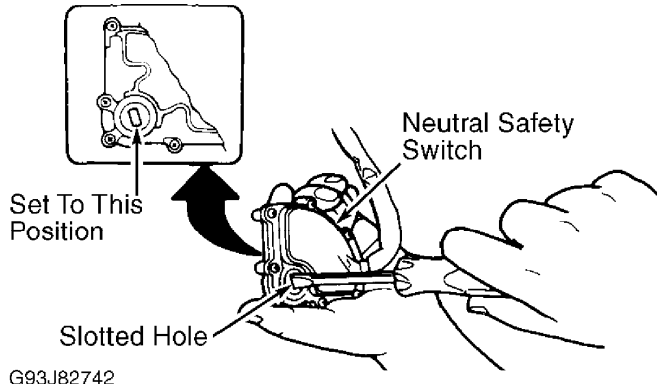


Fig. 22: Adjusting Park/Neutral Position Switch (Metro)
Courtesy of General Motors Corp.

Prizm

1) Set parking brake. Place gear selector lever in "N" position. Loosen PNP switch adjusting bolt. Align neutral basic line scribed in switch body with groove in switch sleeve. See Fig. 23.

2) Hold switch at this position and tighten PNP switch adjusting bolt to 48 INCH lbs. (5.4 N.m). Ensure starter operates with transaxle in Neutral and Park only.

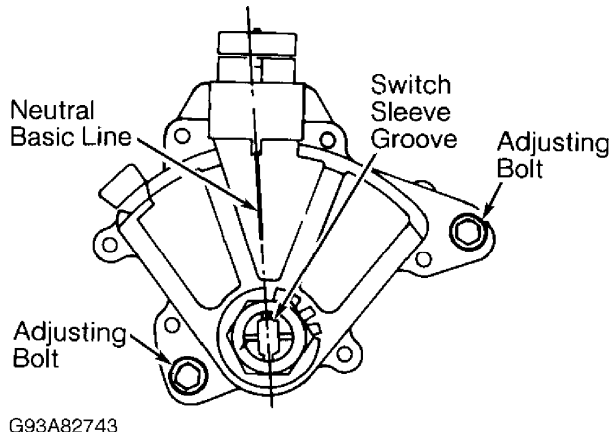


Fig. 23: Adjusting Park/Neutral Position Switch (Prizm)
Courtesy of General Motors Corp.

SHIFT CABLE (FWD)

CAUTION: Misadjusted shift linkage could cause transmission clutch and/or band failure.

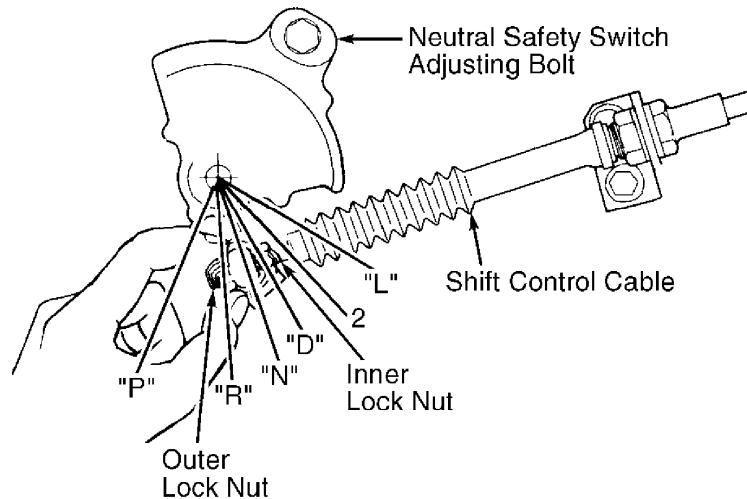
NOTE: Most FWD vehicles are equipped with a self-adjusting shift cable.

Metro

1) Set parking brake. Move gear selector lever to Neutral. Loosen inner and outer lock nuts. See Fig. 24. Ensure transaxle control lever is in Neutral. Tighten outer lock nut by hand until it

contacts control lever.

2) Using a wrench, tighten inner lock nut. Ensure transaxle operates in all gear ranges. Ensure vehicle will not move with ignition switch in LOCK position, and transaxle control lever in "P" position. Ensure correct operation in all gear selector lever positions.



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Fig. 24: Adjusting Shift Cable (Metro)
Courtesy of General Motors Corp.

Prizm

1) Set parking brake. Loosen adjusting nut on transaxle control lever. Move transaxle control lever on transaxle fully counterclockwise to Park position.

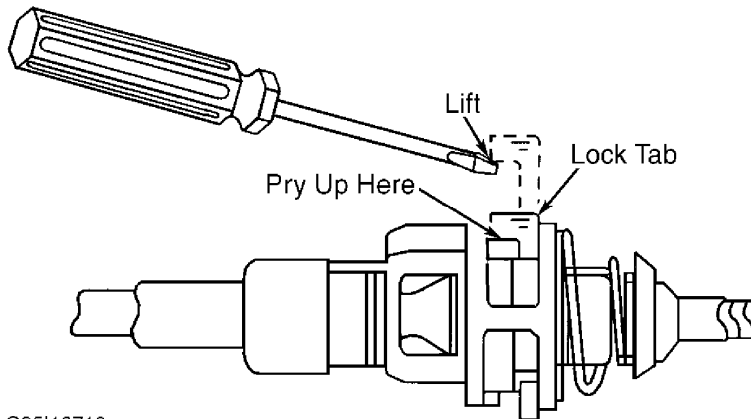
2) Move transaxle control lever clockwise 2 notches to "N" position. While holding transaxle control lever, pull shift control cable tight. Tighten adjustment nut. Ensure vehicle will not move with ignition switch in LOCK position, and transaxle control lever in "P" position. Ensure correct operation in all gear selector positions.

Saturn

1) Place gear selector in Park. Raise and support vehicle. Disconnect cable assembly at transaxle control lever. Ensure transaxle control lever is turned fully clockwise, to Park.

2) Using a small screwdriver, pry up on cable adjuster lock tab. See Fig. 25. Reconnect cable assembly to transaxle control lever. Ensure cable housing moves freely inside adjuster housing. Move cable housing back and forth, and note amount of end play.

3) Adjust cable by moving cable housing 1/2 amount of total end play. Press lock tab down and ensure cable housing is secure. Check park lock cable adjustment. See PARK LOCK CABLE. Ensure correct operation in all gear selector positions.



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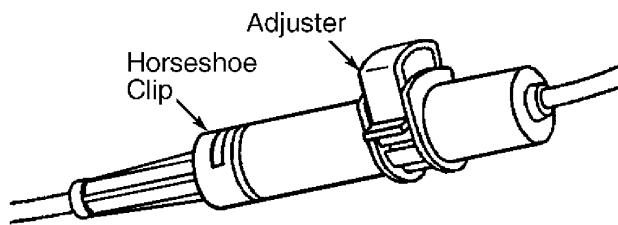
Fig. 25: Locating Shift Cable Lock Tab (Saturn)
Courtesy of General Motors Corp.

"W" Body

1) Place gear selector lever in Neutral. Disconnect shift cable at both ends. Shift cable adjuster is located at center of shift cable. Push shift cable adjuster to upward position to release. See Fig. 26

2) Depress the adjuster clip once. This mobilizes the adjuster housing toward the transaxle end fitting. Line up the end fittings so they slide together until you feel the parts cam together and lock.

3) Depress adjuster clip completely. This locks cable into its adjusted service position. Pull cable in the opposite direction to assure full system adjustment of shift cable. Ensure horseshoe clip is flush with housing for full engagement. Ensure correct operation in all gear selector positions.

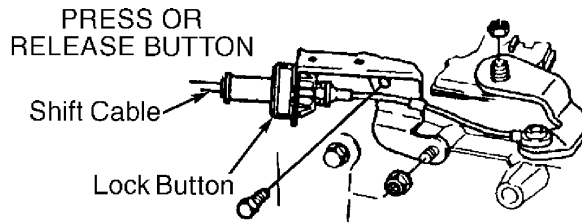


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Fig. 26: Adjusting Shift Cable ("W" Body)
Courtesy of General Motors Corp.

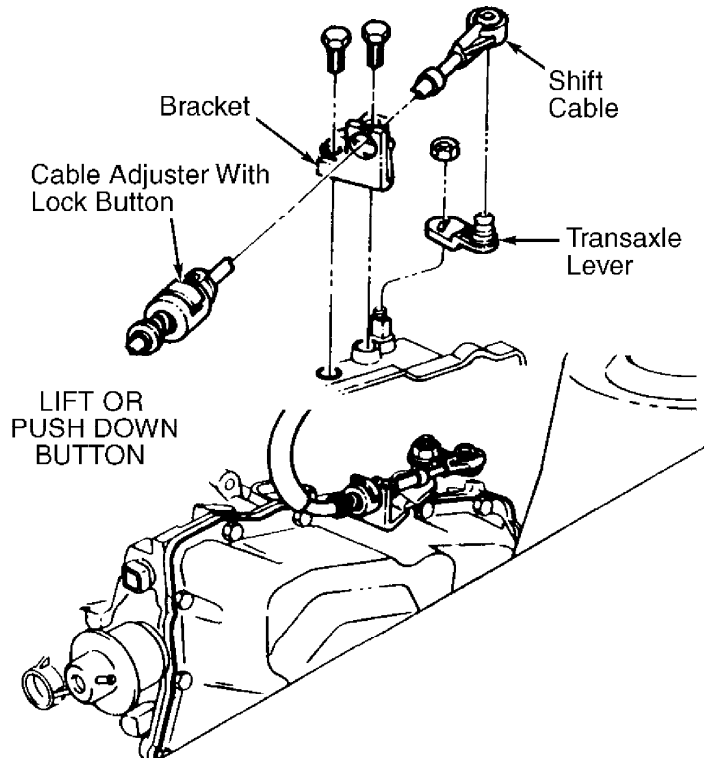
All Models Except Metro, Prizm, Saturn & "W" Body

Place gear selector lever in Neutral. Lift or press lock button on cable adjuster at transaxle mounting bracket. See Figs. 27 and 28. Place transaxle control lever in Neutral detent. Push down on release lock button. Ensure correct operation in all gear selector positions.



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Fig. 27: Adjusting Shift Cable ("J" & "N" Bodies)
Courtesy of General Motors Corp.



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Fig. 28: Adjusting Shift Cable (Except "J" & "N" Bodies)
Courtesy of General Motors Corp.

SHIFT CABLE (RWD)

CAUTION: Adjust shift cable so engine starts in Park or Neutral only. Misadjusted shift linkage could cause transmission clutch and/or band failure.

"F" Body

1) Place gear selector lever in Park. Raise and support vehicle. Disconnect shift cable from gear selector lever pin. Ensure gear selector lever is in Park by rotating lever clockwise to Park detent. Remove retainer from shift cable. Connect shift cable to lever. If necessary, press cable adjuster button to line up cable with lever.

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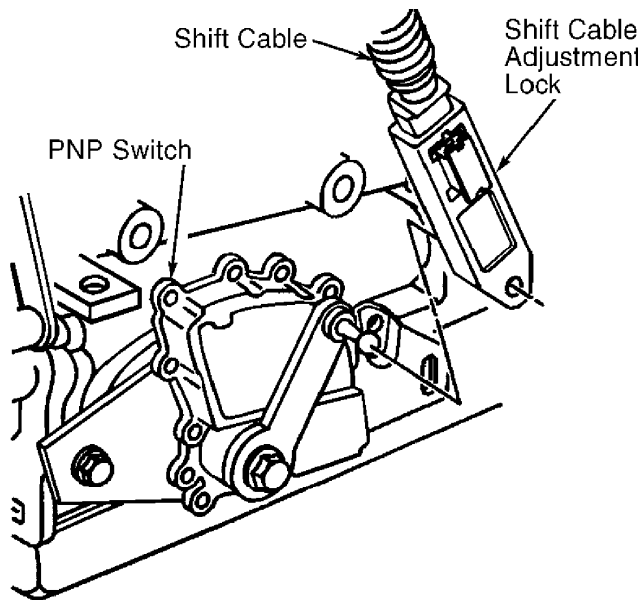
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2) With cable connected, press cable adjuster button down and release. Install shift cable retainer. Lower vehicle and check gear selector lever operation.

"Y" Body

1) Place gear selector lever in Neutral. Raise and support vehicle. Using a flat-blade screwdriver, pry up to release shift cable adjustment lock. See Fig. 29.

2) Ensure gear selector lever and transmission control lever are in Neutral. Press in on shift cable lock to secure adjustment of cable. Lower vehicle and check gear selector lever operation.



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Fig. 29: Adjusting Shift Cable (Corvette)
Courtesy of General Motors Corp.

SHIFT LINKAGE ROD (RWD)

CAUTION: Misadjusted shift linkage could cause transmission clutch and/or band failure.

Catera

- 1) Position shift control lever in Park. Raise and support vehicle. Loosen shift linkage adjuster bolt from underneath vehicle.
- 2) Hold transmission control lever on transmission against rear stop to eliminate play. Tighten control lever rod adjustment bolt to 71 INCH lbs. (8 N.m).
- 3) Inspect operation of starting system with gear selector lever in each position. Engine should only crank when lever is in PARK or NEUTRAL position. Ensure correct operation in all gear selector positions.

SHIFT LOCK SOLENOID (METRO)

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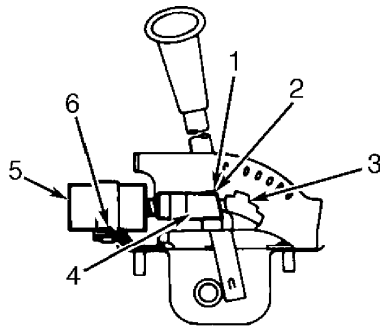
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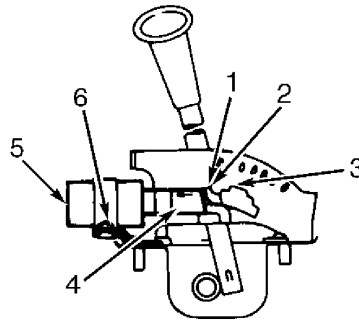
NOTE: Shift lock solenoid prevents gear selector lever from being moved from Park unless brake pedal is applied.

1) Remove center console. Solenoid should be adjusted so when ignition switch is in OFF position, solenoid is NOT operating (lock position). With ignition on and brake pedal depressed, solenoid should operate (unlock position). Ensure lock plate detent pin is in correct position. See Fig. 30.

2) If operation is not as specified, loosen solenoid mounting screws and reposition solenoid. With ignition off, gear selector lever should not shift from Park. If manual override is enabled with ignition off, gear selector lever should move from Park to any other gear position.



SHIFT LOCK SOLENOID IS NOT OPERATING



SHIFT LOCK SOLENOID IS OPERATING

- | | |
|-------------------------|----------------------------------------|
| 1. Apply Lithium Grease | 4. Solenoid Lock Plate |
| 2. Detent Pin | 5. Shift Lock Solenoid |
| 3. Guide Plate | 6. Shift Lock Solenoid Retaining Screw |

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Fig. 30: Shift Lock Solenoid Operation (Metro)
Courtesy of General Motors Corp.

STOPLIGHT SWITCH

All Models Except Saturn

With brake pedal in released position, ensure stoplight switch plunger is completely depressed.

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Saturn

1) Loosen stoplight switch mounting nut enough to allow switch to move in adjustment slot. Install Adjustment Gauge (SA9303BR) between switch and actuator pad on brake pedal arm, ensuring switch plunger protrudes through slot in gauge.

2) Pull up on brake pedal with moderate force while pushing switch forward against gauge.

NOTE: Hold switch perpendicular to actuator pad (maintaining alignment) while tightening mounting nut.

3) Tighten switch mounting nut. Release brake pedal. With pedal released and adjustment gauge still in position, ensure gauge will swing freely from side to side. If gauge does not swing freely, repeat steps 1)-3).

4) With gauge still in position, pull up on brake pedal with very light force and tap gauge side to side. If gauge swings freely, repeat steps 1)-4).

5) Inspect switch plunger. If .040" (1.0 mm) or less of plunger is visible between switch and switch actuator pad, switch is correctly adjusted. Height of rounded crown of plunger is equivalent to .040" (1.0 mm). If more than .040" (1.0 mm) of plunger is visible, repeat steps 1)-5).

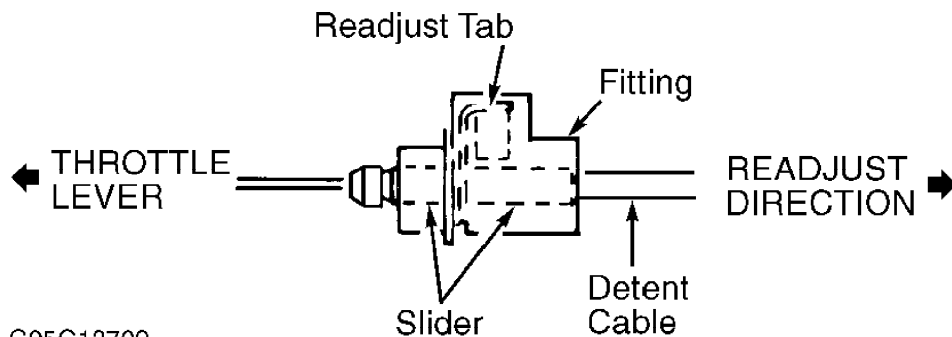
THROTTLE VALVE CABLE

NOTE: Throttle Valve (T.V.) cable is not used on electronically controlled models.

Cavalier & Sunfire (3T40)

1) Turn ignition off. Press and hold metal readjust tab on cable adjuster at cable support bracket on engine. See Fig. 31. Pull cable housing away from throttle lever until housing stops and is completely against adjuster. Release readjust tab.

2) Manually rotate throttle lever to its full-throttle position. Ensure slider moves (ratchets) toward lever when lever is rotated to its full-throttle position. Check cable for sticking and binding. Road test vehicle.



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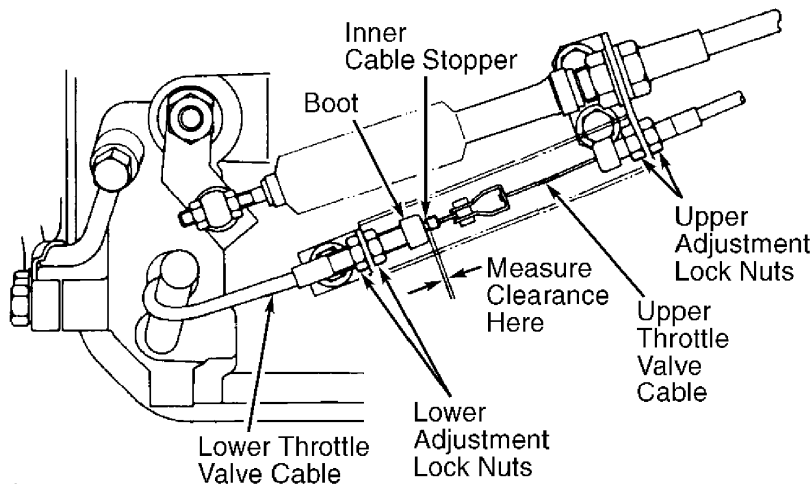
Fig. 31: Adjusting T.V. Cable (3T40)
Courtesy of General Motors Corp.

Metro

1) Ensure accelerator cable is adjusted. Accelerator cable should have .40-.60" (10-15 mm) end play at throttle body with accelerator at idle position and engine off.

2) Warm engine to normal operating temperature. Ensure base idle speed (hot) is to specification. Turn engine off. Remove T.V. cable cover. Check boot-to-inner cable stopper clearance. See Fig. 32.

3) If clearance is greater than .04" (1.0 mm), loosen lower adjustment lock nuts and adjust cable length. If lower adjustment lock nuts do not provide enough adjustment, use upper adjustment lock nuts to change cable length. See Fig. 32. Tighten all lock nuts. Road test vehicle.



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Fig. 32: Adjusting T.V. Cable (Metro)
Courtesy of General Motors Corp.

Pri zm

Ensure throttle valve is completely closed. Adjust T.V. cable housing so distance between end of outer cable boot and cable stopper is 0-.030" (0-1.0 mm). See Fig. 33. Tighten T.V. cable adjusting and lock nuts to 71 INCH lbs. (8 N.m). Road test vehicle.

NOTE: On Pri zm, use the following procedure if installing a NEW T.V. cable.

Pri zm (Cable Replacement)

1) Disconnect negative battery cable. Loosen T.V. cable adjusting and lock nuts. Remove T.V. cable from throttle valve linkage and T.V. cable bracket. Remove left splash shield. Remove neutral safety switch.

2) Drain transaxle fluid and remove oil pan. Remove T.V. cable from throttle valve cam at valve body assembly. Remove T.V. cable from transaxle.

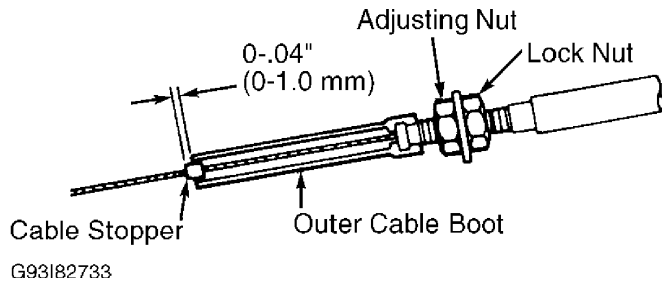
3) If installing a NEW T.V. cable, stake a NEW stopper in position. Bend cable so it has about a 7.870" (200 mm) radius. See

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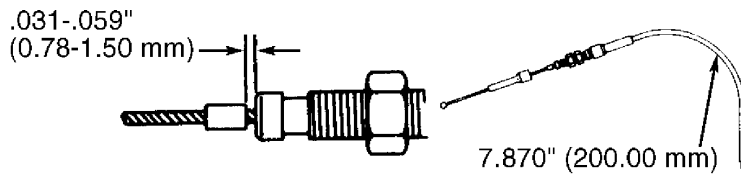
Fig. 34. Pull on inner cable until a slight resistance is felt. Stake T.V. cable stopper .031-.059" (0.78-1.50 mm) from end of T.V. cable.

4) Install T.V. cable into transaxle and tighten retaining bolt to 71 INCH lbs. (8 N.m). Install T.V. cable into throttle valve cam at valve body assembly. To complete installation, reverse removal procedure. Adjust T.V. cable and refill transaxle. Road test vehicle.



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Fig. 33: Adjusting T.V. Cable (Prizm)
Courtesy of General Motors Corp.



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Fig. 34: Staking T.V. Cable Stopper (Prizm)
Courtesy of General Motors Corp.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA
Application Ft. Lbs. (N.m)

PNP Switch Mounting Bolts	
A-131L & A-245E	(1)
ECC 3-Speed	17 (23)
MP6 & MP7	(2)
3T40, 4T40-E & 4T45-E	18 (24)
4L30-E	(3)
4L60-E	
"F" Body	(4)
"Y" Body	20 (27)
4T65-E & 4T80-E	18 (24)
Oil Drain Plug	
A-131L	17 (23)
A-245E	13 (17)
ECC 3-Speed	17 (23)
Oil Fill Plug	
MP6 & MP7	22 (30)
4L30-E	33 (45)
4L60-E ("Y" Body)	22 (30)

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INCH Lbs. (N. m)

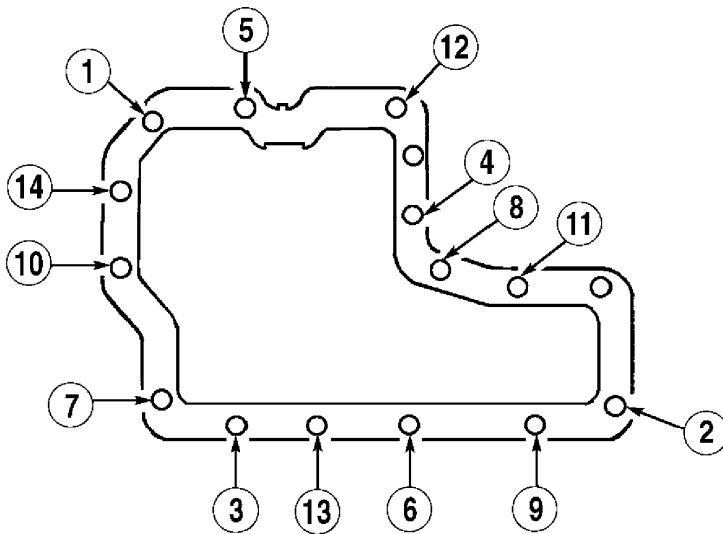
Oil Pan Bolts

A-131L & A-245E	43 (4.9)
ECC 3-Speed	53 (6)
MP6 & MP7	106 (12)
3T40	89 (10)
4L30-E	97 (11)
4T40-E & 4T45-E	106 (12)
4L60-E	124 (14)
4T60-E & 4T65-E	124 (14)
4T80-E	(5)

- (1) - Tighten PNP switch mounting bolts to 48 INCH lbs. (5.4 N.m).
- (2) - Tighten PNP switch mounting bolts to 124 INCH lbs. (14 N.m)
- (3) - Tighten PNP switch mounting bolts to 106 INCH lbs. (12 N.m).
- (4) - Tighten PNP switch mounting bolts to 19 INCH lbs. (1.2 N.m).
- (5) - Tighten oil pan bolts in 3 steps in sequence as shown.

See Fig. 35.

AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA



STEP 1: 27 INCH Lbs. (3.1 N.m)
 STEP 2: 53 INCH Lbs. (6.0 N.m)
 STEP 3: 106 INCH Lbs. (12.0 N.m)

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Fig. 35: Oil Pan Bolt Tightening Sequence (4T80-E)
 Courtesy of General Motors Corp.

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