

1998-99 TRANSMISSION SERVICING

Automatic Transmission - Cars - Except Metro & Prizm

APPLICATION & IDENTIFICATION

BODY CODE IDENTIFICATION

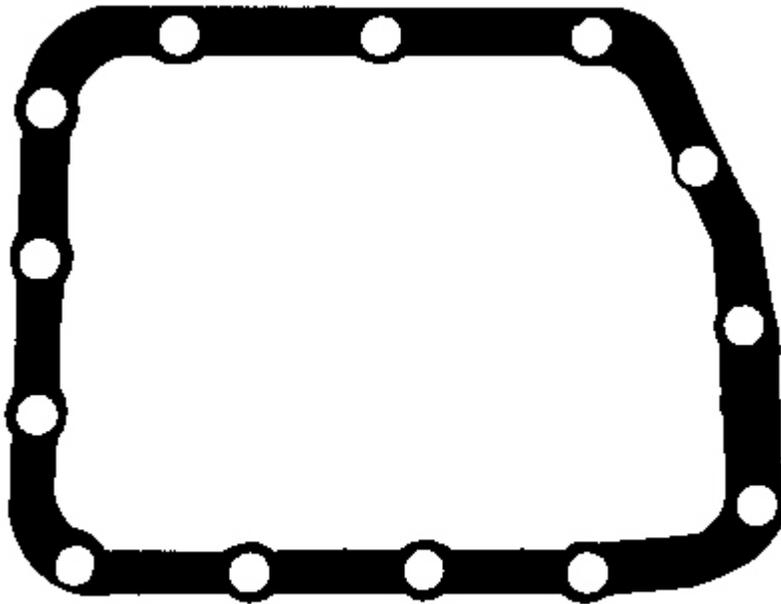
Body Code	Model
"C"	Park Avenue
"E"	Eldorado
"F"	Camaro & Firebird
"G"	Aurora & Riviera
"H"	Bonneville, Eighty Eight, LeSabre, LSS & Regency
"J"	Cavalier & Sunfire
"K"	DeVille & Seville
"N"	Achieva, Alero, Cutlass, Grand Am, Malibu & Skylark
"V"	Catera
"W"	Century, Grand Prix, Intrigue, Lumina, Monte Carlo & Regal
"Y"	Corvette
"Z"	Saturn

AUTOMATIC TRANSMISSION & TRANSAXLE IDENTIFICATION

Vehicle Application	Trans. Model (RPO Code)
Buick	
Century	4T60E (M13)
LeSabre	4T65E (MN3 Or M15)
Park Avenue	4T65E (MN3 Or MN7)
Regal	4T65E (M15 Or MN7)
Riviera	4T65E (MN7)
Skylark	4T60E (MN13)
Cadillac	
Catera	4L30E (ML4)
DeVille	4T80E (MH1)
Eldorado	4T80E (MH1)
Seville	4T80E (MH1)
Chevrolet	
Camaro	4L60E (M30)
Cavalier	3T40 (MD9) Or 4T40E (MN4)
Corvette	4L60E (M30)
Lumina	
3.1L	4T60E (M13)

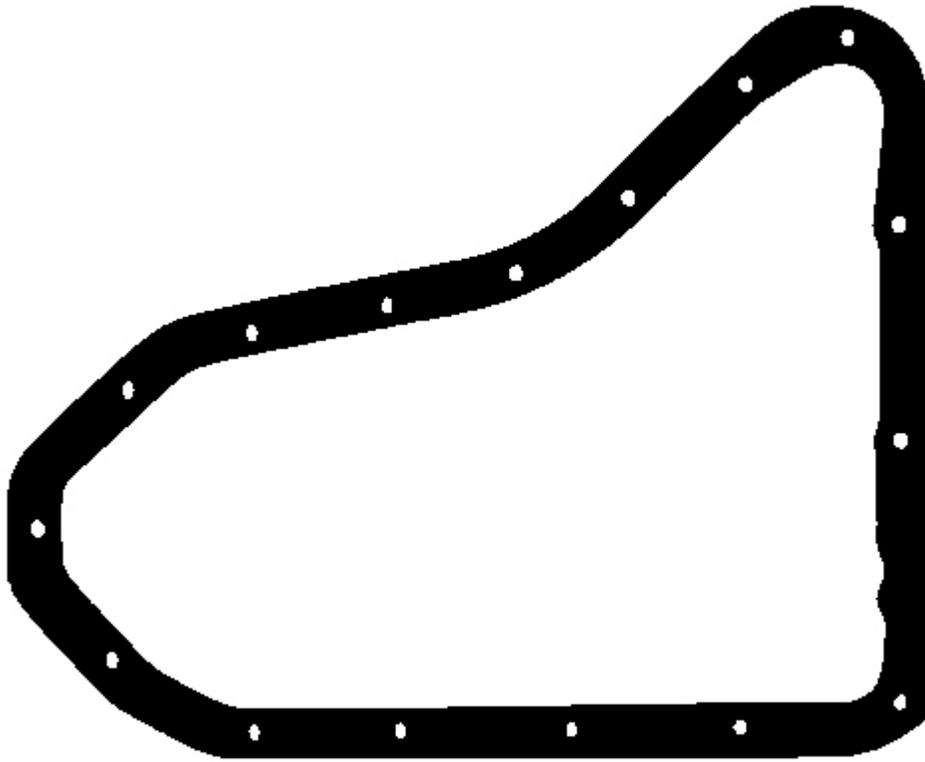
3.8L	4T65E (M15)
Malibu	4T40E (MN4)
Monte Carlo	
3.1L	4T60E (M13)
3.8L	4T65E (M15)
Oldsmobile	
Achieva	4T40E (MN4) Or 4T60E (M13)
Alero	
2.4L	4T40E (MN4)
3.4L	4T45E (MN5)
Aurora	4T80E (MH1)
Cutlass	4T40E (MN4)
Eighty Eight	4T65E (M15 Or MN3)
Intrigue	
3.5L	4T65E (MN3)
3.8L	4T65E (M15)
LSS	4T65E (MN7 Or MN3)
Regency	4T65E (M15)
Pontiac	
Bonneville	4T65E (MN3, MN7 Or M15)
Firebird	4L60E (M30)
Grand Am	
2.4L	4T40E (MN4) Or 4T60E (M13)
3.1L	4T60E (M13)
3.4L	4T45E (MN5)
Grand Prix	
3.1L	4T60E (M13)
3.8L	4T65E (MN7 Or M15)
Sunfire	
2.2L	3T40 (MD9) Or 4T40E (MN4)
2.4L	4T40E (MN4)
Saturn	MP6 & MP7

OIL PAN GASKET IDENTIFICATION



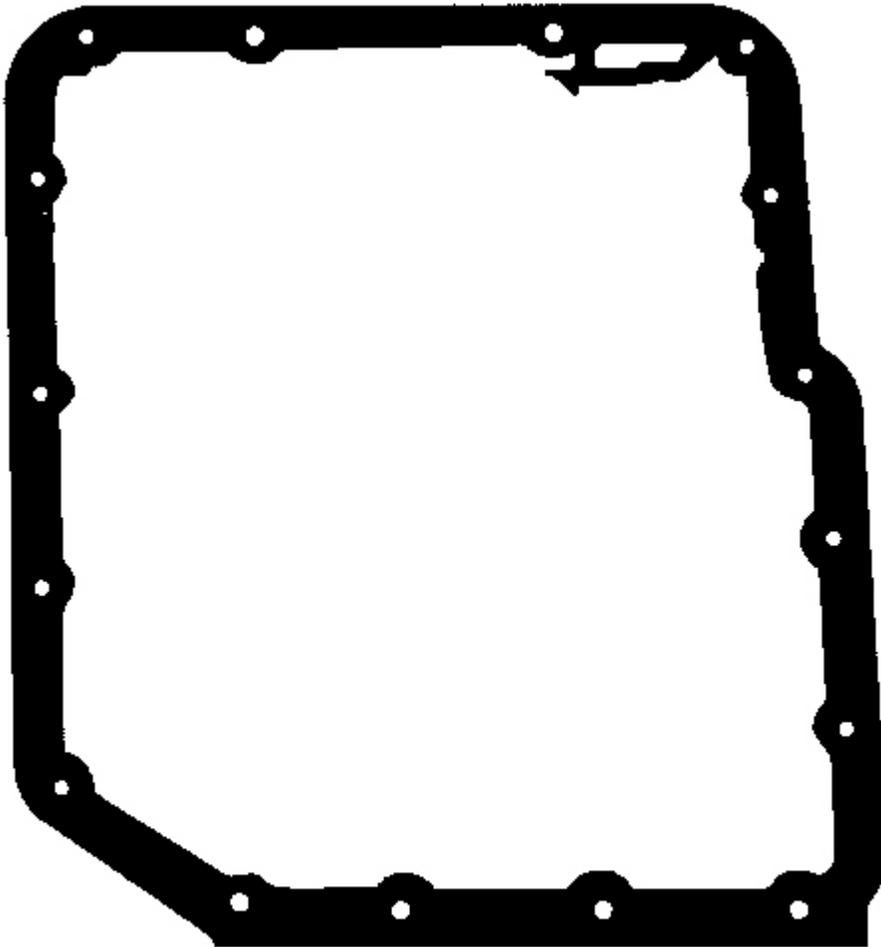
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Fig. 1: Identifying Saturn MP6/MP7 Oil Pan Gasket



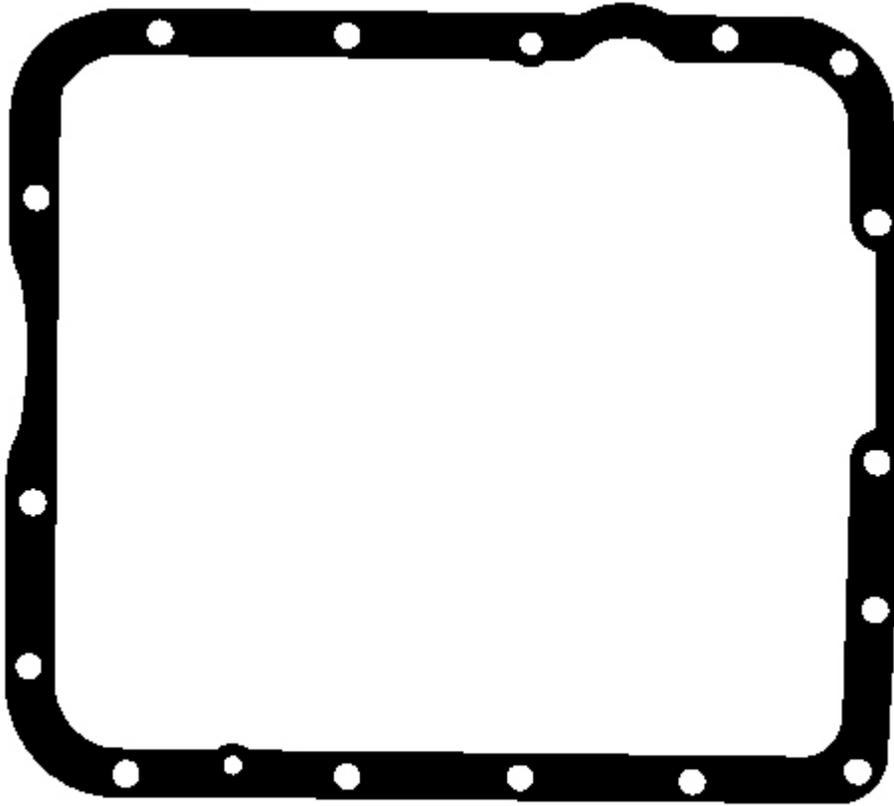
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Fig. 2: Identifying Hydra-Matic 3T40 Oil Pan Gasket



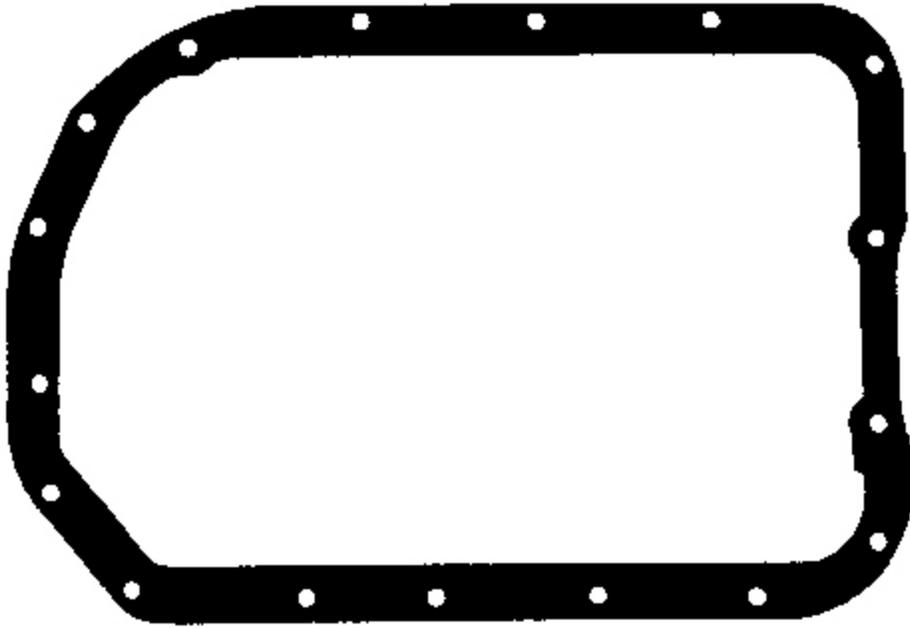
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Fig. 3: Identifying Hydra-Matic 4L30-E Oil Pan Gasket



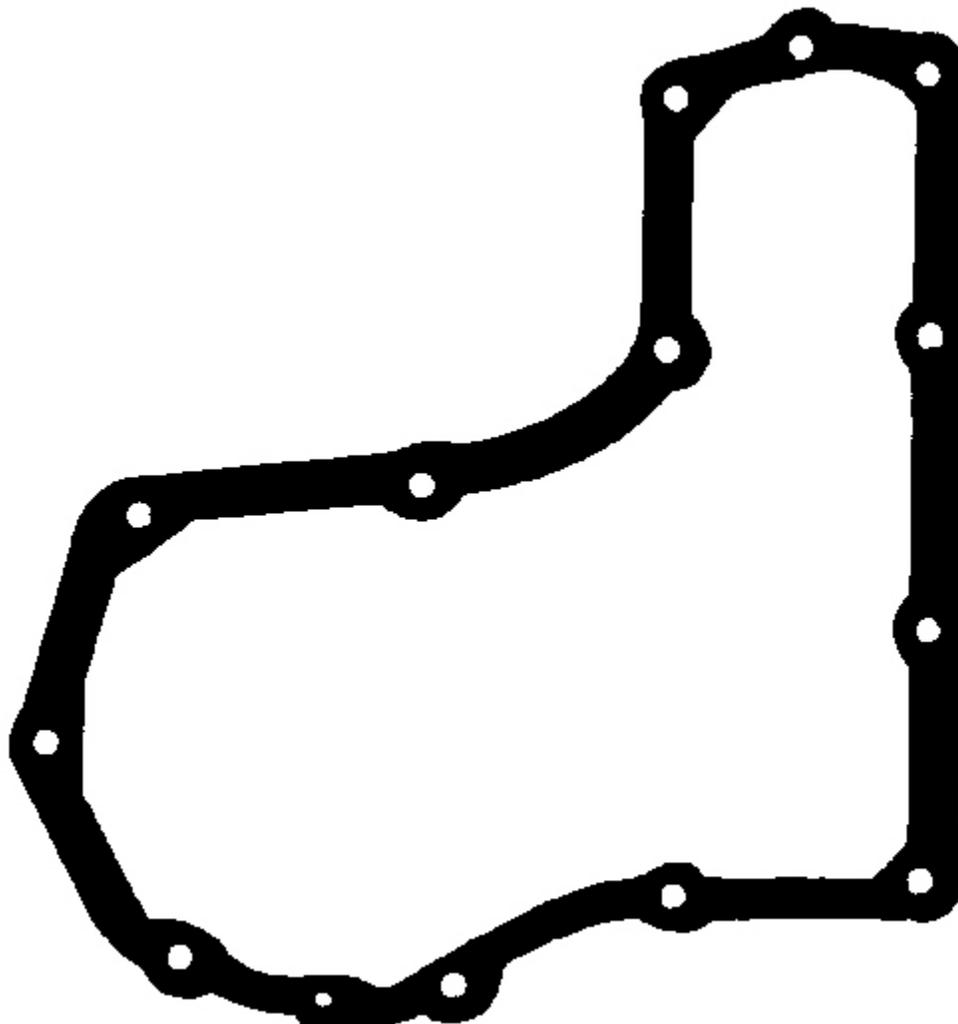
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Fig. 4: Identifying Hydra-Matic 4L60-E Oil Pan Gasket



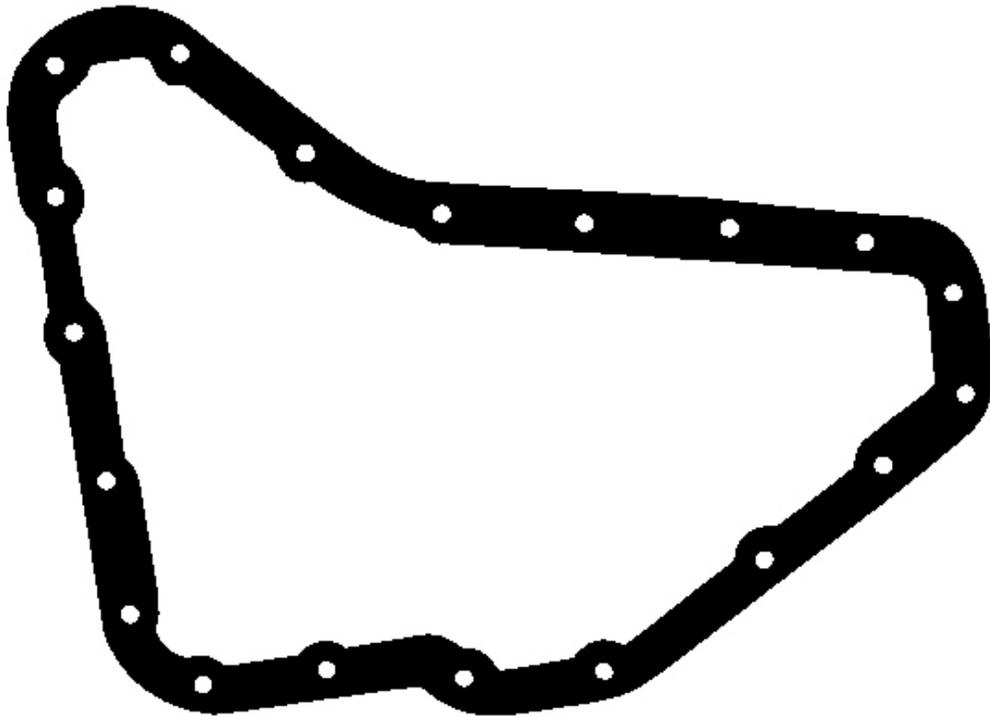
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Fig. 5: Identifying Hydra-Matic 4L80-E Oil Pan Gasket



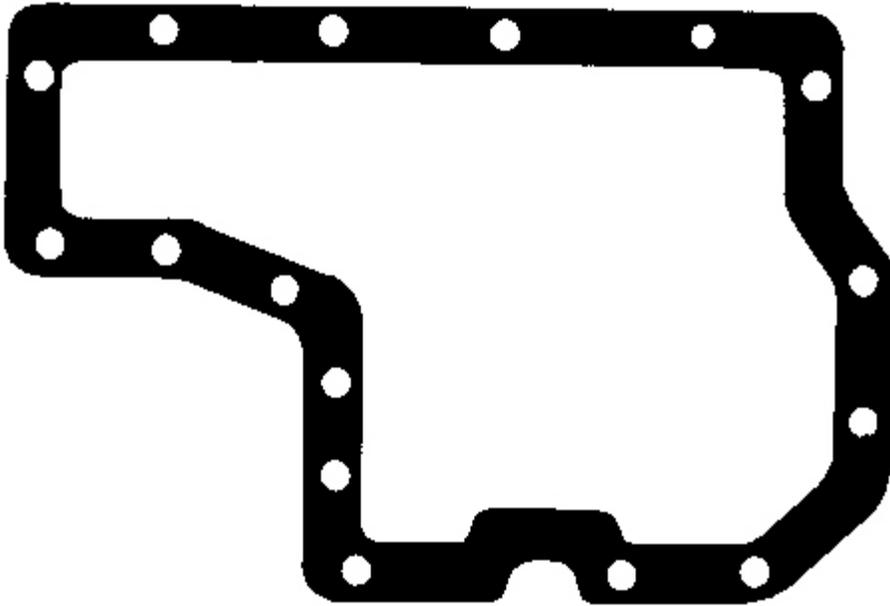
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Fig. 6: Identifying Hydra-Matic 4T40-E & 4T45-E Oil Pan Gasket



G95A13698

Fig. 7: Identifying Hydra-Matic 4T60-E & 4T65-E Oil Pan Gasket



G94J32572

Fig. 8: Identifying Hydra-Matic 4T80-E Oil Pan Gasket

LUBRICATION

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** procedure. To reset message, press and hold **OFF** and **REAR DEFOG** buttons until **TRANS FLUID RESET** appears in Information Center (5-20 seconds).

Except Saturn

Check transmission fluid level 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), fluid and filter should be changed every 50,000 miles.

Saturn

Check fluid at every engine oil change. Under normal conditions, replace fluid and filter every 30,000 miles.

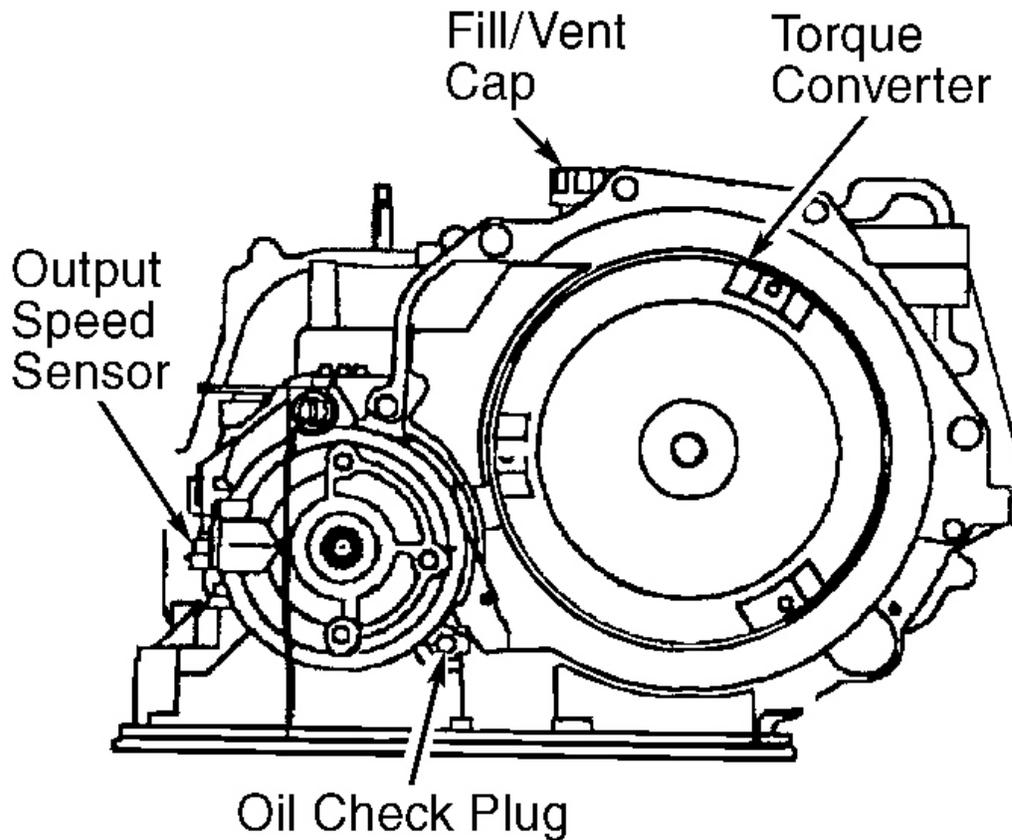
CHECKING FLUID LEVEL

4L30-E & 4L60-E (RWD)

1. Fluid level must be check at temperature of 113-185°F (45-85°C). Start engine and place gear selector in Park. Raise vehicle on hoist. With engine running at idle, remove fill plug from side of transmission pan and check fluid level.
2. Fluid should be at lower level of fill plug. Adjust fluid as necessary. Use an oil suction gun to add fluid. If fluid level is low add fluid in one pint increments. Install filler plug and tighten to specification. Lower vehicle.

4T40-E & 4T45-E

1. Fluid level must be checked at temperature of 104°F (40°C). To obtain proper temperature, perform the following:
 - Idle vehicle for 3-5 minutes.
 - Shift into each gear position, holding in each position for 3 seconds.
2. Place gear selector in Park. 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. 9** . Remove oil check plug.



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Fig. 9: Locating 4T40-E & 4T45-E Oil Check Plug
Courtesy of GENERAL MOTORS CORP.

3. Oil level should be at 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 10 ft. lbs. (14 N.m).

CAUTION: DO NOT overfill transmission. When transmission is hot, one pint of fluid will raise fluid level from ADD 1 PT. or .5L mark to FULL HOT mark on dipstick.

All Others

1. Start engine. Operate vehicle for at least 15 minutes or until operating temperature is reached. With engine at curb 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 on dipstick.

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 about 30 minutes.

RECOMMENDED FLUID

Use only Dexron-III Automatic Transmission Fluid (ATF).

FLUID CAPACITIES

FLUID CAPACITIES ⁽¹⁾

Application	Drain & Refill ⁽²⁾ Qts. (L)	Overhaul Qts. (L)
3T40	4.0 (3.8)	7.0 (6.6)
4L30-E	7.0 (6.6)	(3)
4L60-E		
Corvette	5.0 (4.7)	10.8 (10.2)
Except Corvette	5.0 (4.7)	11.0 (10.6)
4T40-E & 4T45-E	7.4 (7.0)	12.9 (12.2)
4T60-E & 4T65-E	7.4 (7.0)	10.0 (9.5)
4T80-E	11.0 (10.6)	15.0 (14.2)
Saturn	4.2 (4.0)	7.4 (7.0)

(1) Fluid capacities listed are approximate. Always fill to FULL mark.

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

(3) Transmission does not have a dipstick. Fill to bottom of fill plug.

DRAINING & REFILLING

NOTE: If oil pan bolts are equipped with conical washers, DO NOT reuse bolts if conical washers have become reversed. See Fig. 10 .

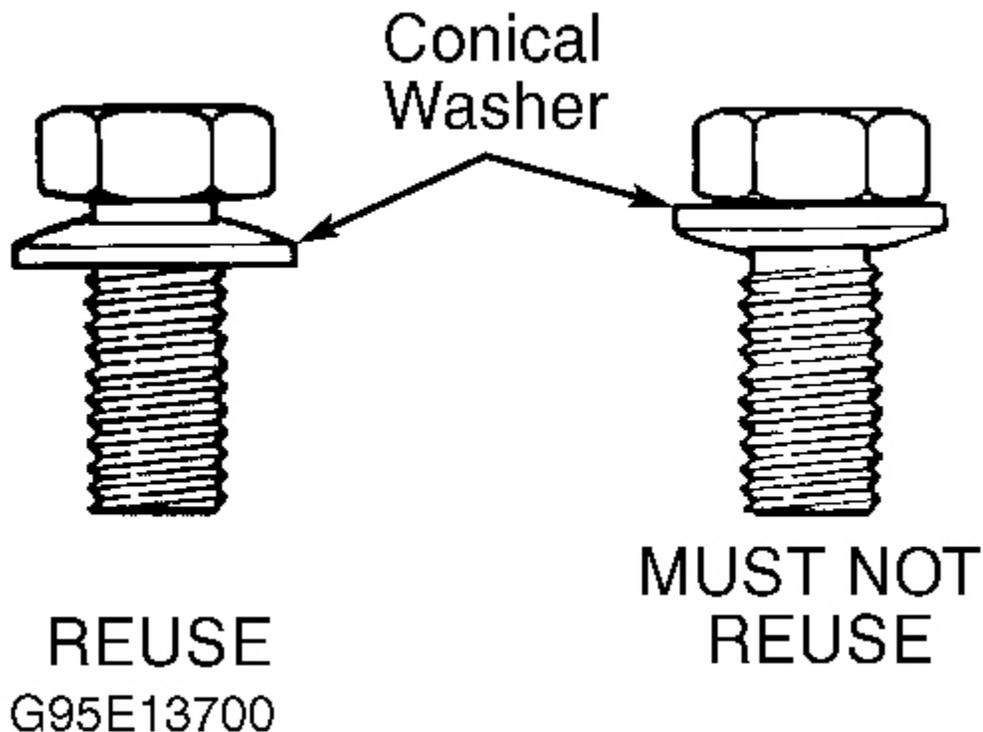


Fig. 10: Identifying Conical Washers
Courtesy of GENERAL MOTORS CORP.

1. Raise vehicle, and place large drain pan under transmission oil pan. Remove transmission oil pan front and side bolts only. Loosen rear bolts about 4 turns each.
2. Carefully pry pan loose using screwdriver. Allow fluid to drain. Remove remaining bolts, and remove oil pan. Discard old pan gasket. 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 pick-up tube recess. Lubricate with clean oil before installation.
4. Install filter assembly into pick-up tube recess. Install oil pan using NEW gasket, and tighten pan bolts to specification. See **TORQUE SPECIFICATIONS** . Add required amount of fluid to transmission through filler tube.
5. Start engine with gear selector lever in Park and parking brake applied. Check fluid level. See **CHECKING FLUID LEVEL** . Add fluid if necessary. DO NOT overfill.

ADJUSTMENTS

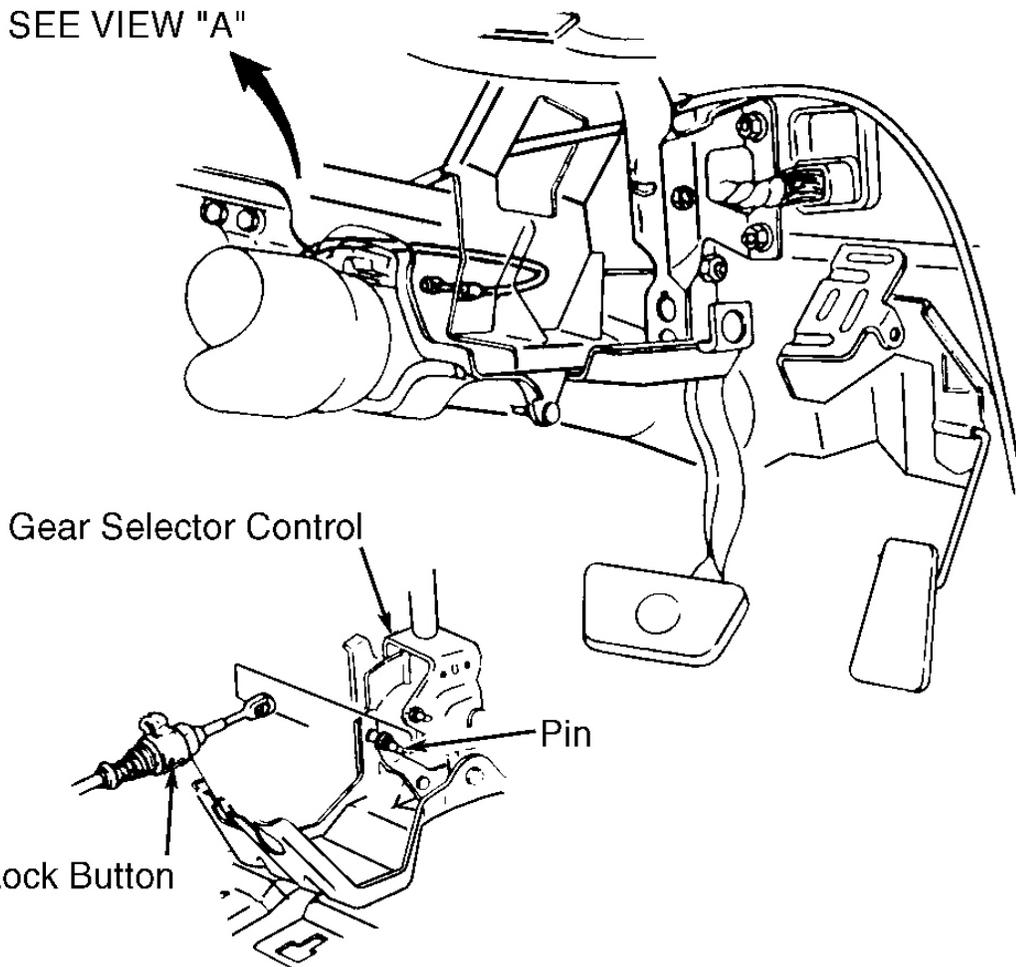
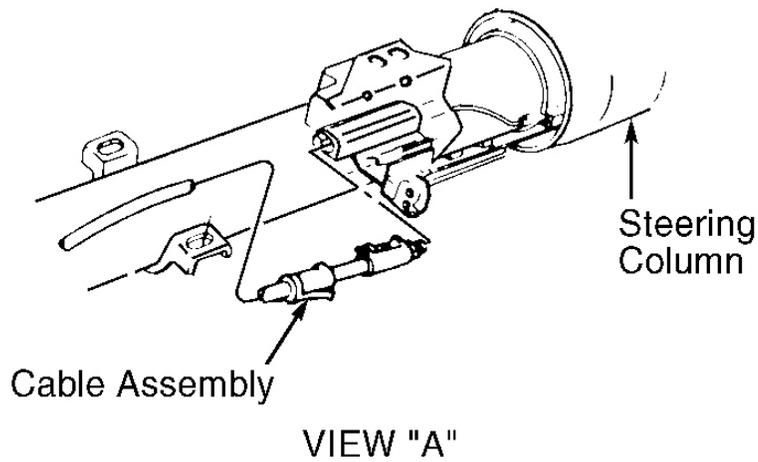
PARK LOCK CABLE (FLOOR SHIFT)

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** before disconnecting battery.

NOTE: Vehicles with column shift do not use a park/lock control cable. On all vehicles, with transmission range selector lever in Park position and ignition switch in LOCK position, ensure transmission range selector 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 (button up). See [Fig. 11](#) . Move cable connector nose rearward until key can be removed from ignition. Lock cable adjuster (button down).

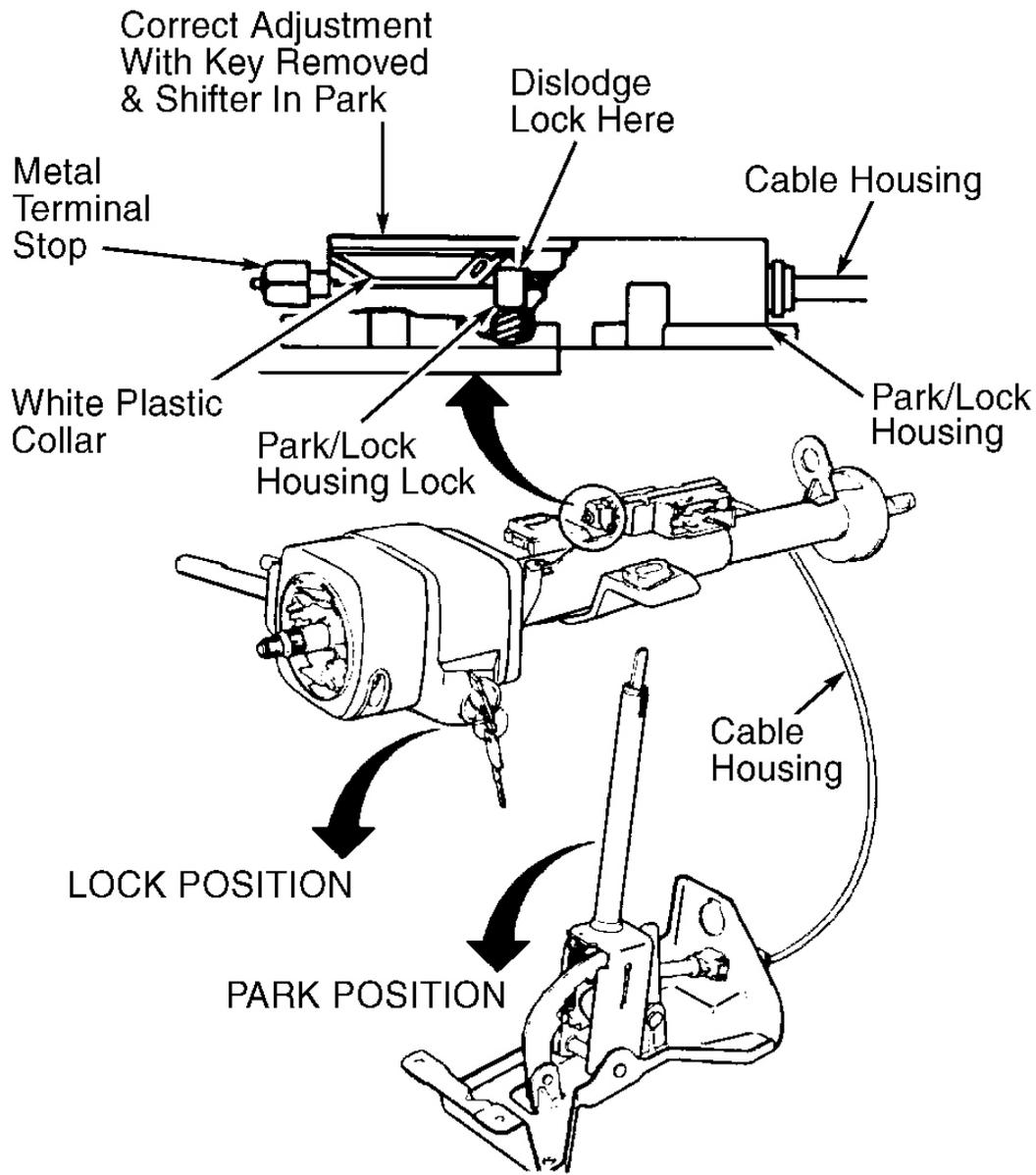


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Fig. 11: Adjusting Park Lock Cable ("F" & "N" Bodies - Floor Shift)

"J" Body

1. With ignition switch in RUN position and gear selector lever in Neutral, ensure ignition switch cannot be turned to LOCK position.
2. 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.
3. If system does not perform as described, dislodge park/lock cable housing lock at ignition switch. Adjust outer cable housing to position White plastic collar in park/lock housing. See **Fig. 12** .
4. Ensure no gap is present between metal terminal stop at end of cable and White plastic collar. White plastic collar should be flush or less than .040" (1.0 mm) recessed in park/lock housing. Hold cable in position, and seat park/lock cable housing lock. Retest park/lock cable operation.

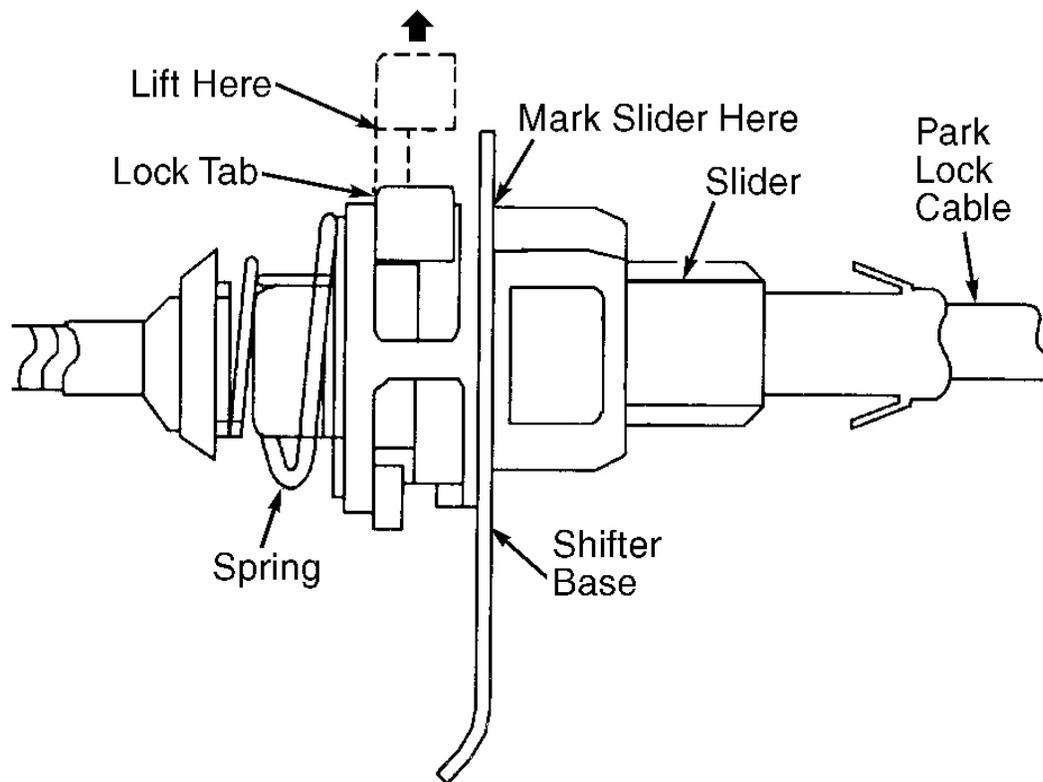


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Fig. 12: Adjusting Park Lock Cable ("J" Body - Floor Shift)
 Courtesy of GENERAL MOTORS CORP.

Saturn

1. Place gear selector in Park, and remove key. Remove cup holder/ashtray assembly. Lift lock tab on park lock cable end. See **Fig. 13**. Depress gear selector shift knob button quickly 3 times to set starting position of cable. Using a sharp pencil, mark starting position on slider. See **Fig. 13**.



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Fig. 13: Locating Park Lock Cable Components (Saturn)
 Courtesy of GENERAL MOTORS CORP.

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 shifter in Park, attempt to shift lever out of Park. Lever should not move. Turn ignition on. Shift lever should be allowed out of Park. Place shift lever in any position except Park and turn ignition off. Ignition key should not be removable. Attempt to place shift lever in Park. Lever should go into Park, and ignition key should be able to be removed.
4. If park lock cable fails any test, readjust cable. Check gearshift cable adjustment. See **SHIFT CABLE (FWD)** . Install cup holder/ashtray assembly.

PARK NEUTRAL POSITION (PNP) SWITCH

NOTE: PNP switch may also be called Transmission Range (TR) switch, and was also

previously known as neutral safety switch. Adjust switch so engine will start in Park or Neutral only.

FWD (Saturn)

Place gear selector 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 12 ft. lbs. (16 N.m) and recheck continuity.

FWD (Except Saturn)

1. Neutral safety switches come in 2 different types. See **Fig. 14** . Ensure shift cable is adjusted. To adjust switch, place gear selector lever in Neutral.
2. Place transaxle lever in Neutral detent. Loosen switch attaching screws. Rotate switch on shifter assembly to align adjustment hole with carrier tang hole.
3. Insert a .094" (2.4 mm) wire gauge about 5/8" (16 mm) into switch holes. Tighten attaching screws. Remove wire gauge. New switches may have a plastic pin installed in hole. Plastic pin is designed to shear off during initial shift lever operation.

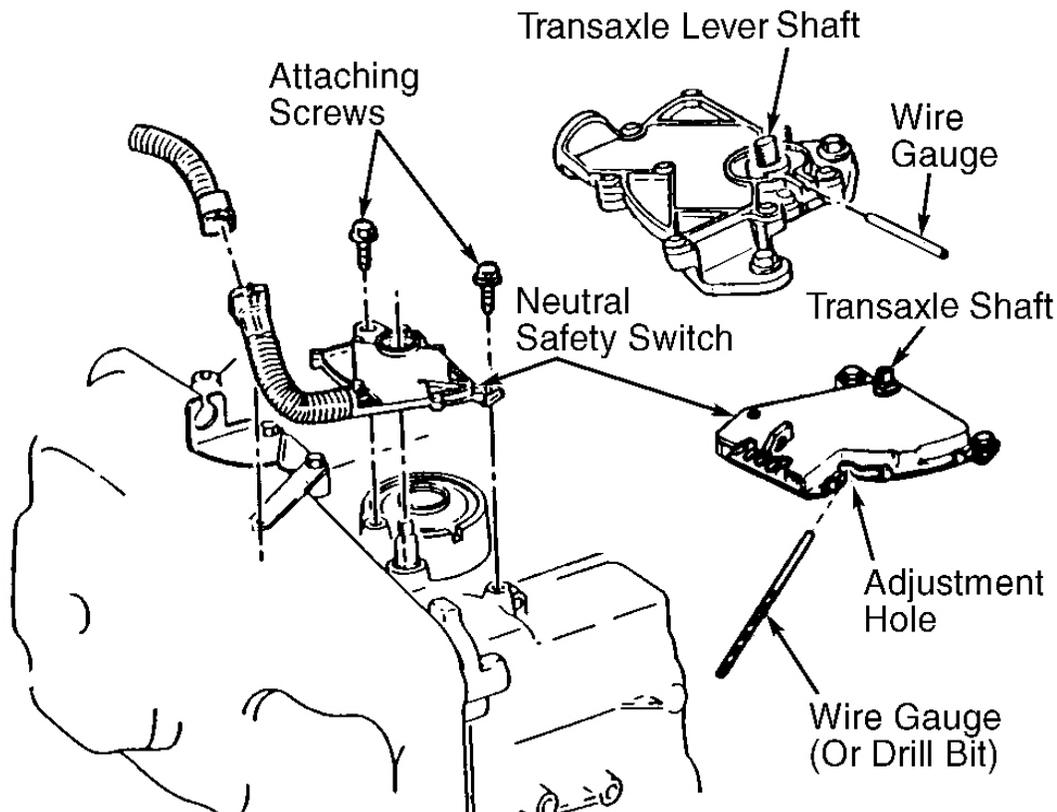


Fig. 14: Adjusting Park Neutral Position (PNP) Switches (FWD)

Courtesy of GENERAL MOTORS CORP.

RWD (Camaro, Corvette & Firebird)

1. Disconnect negative battery cable. Remove gear selector knob and center console cover. Place gear selector lever in Neutral. If old switch is being adjusted, go to next step. If NEW switch is being installed, go to step [4](#) .
2. Align tang on switch with tang slot on shift control. See **Fig. 15** . Loosen switch mounting nuts. Rotate 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 switch. Rotate switch until pin drops to depth of .59" (15 mm). Tighten mounting nuts to 27 INCH lbs. (3 N.m). Vehicle should only start in Park or Neutral.
4. If NEW switch if being installed, insert switch tang in slot on shift control. Tighten mounting nuts to 27 INCH lbs. (3 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 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.

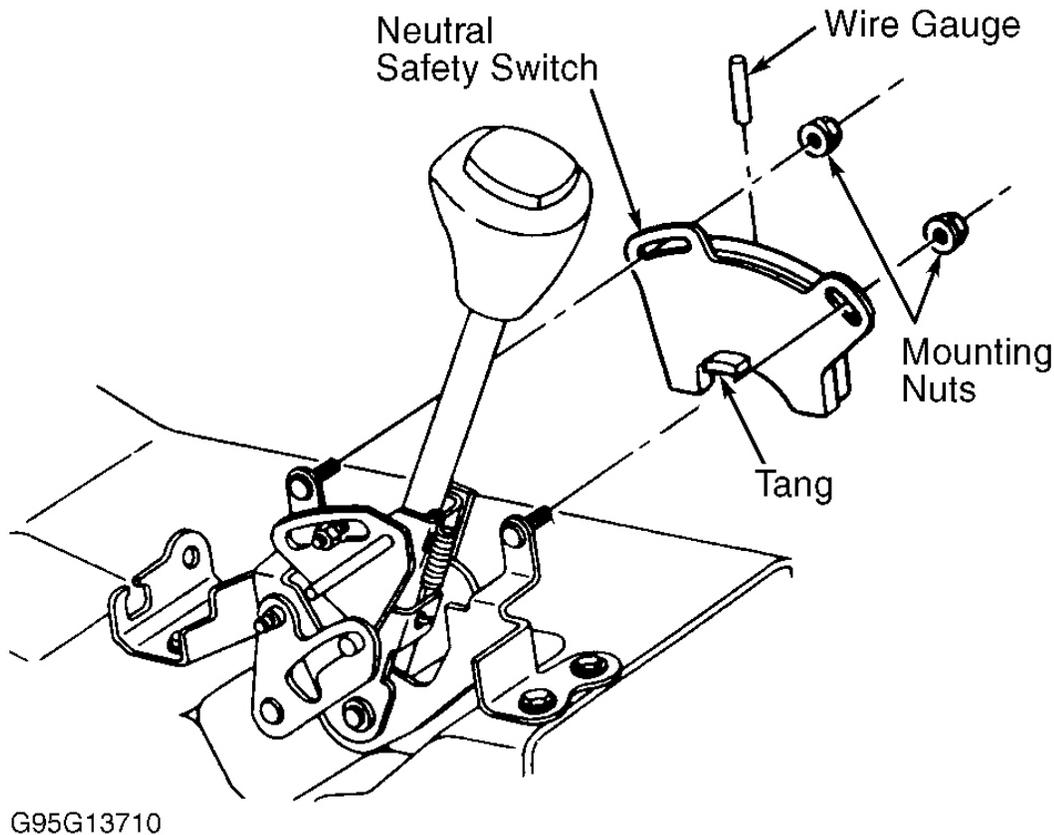


Fig. 15: Adjusting Park Neutral Position (PNP) Switches ("Y" Body Shown; "F" Body Is Similar)
 Courtesy of GENERAL MOTORS CORP.

RWD (Catera)

1. Apply parking brake. Place gear selector to Neutral. Raise and support vehicle. Remove cover from selector lever position switch. Remove selector lever from switch. Disconnect harness connector from switch.
2. Connect ohmmeter between switch terminals "E" and "H". Loosen selector switch-to-transmission bolts. Rotate switch slightly in both directions to determine range of electrical contact (about 5 degrees).
3. Position switch in middle of contact range. Tighten hold-down bolts to 106 INCH lbs. (12 N.m). Install linkages and wiring harness. Tighten selector lever shaft nut to 71 INCH lbs. (71 N.m).

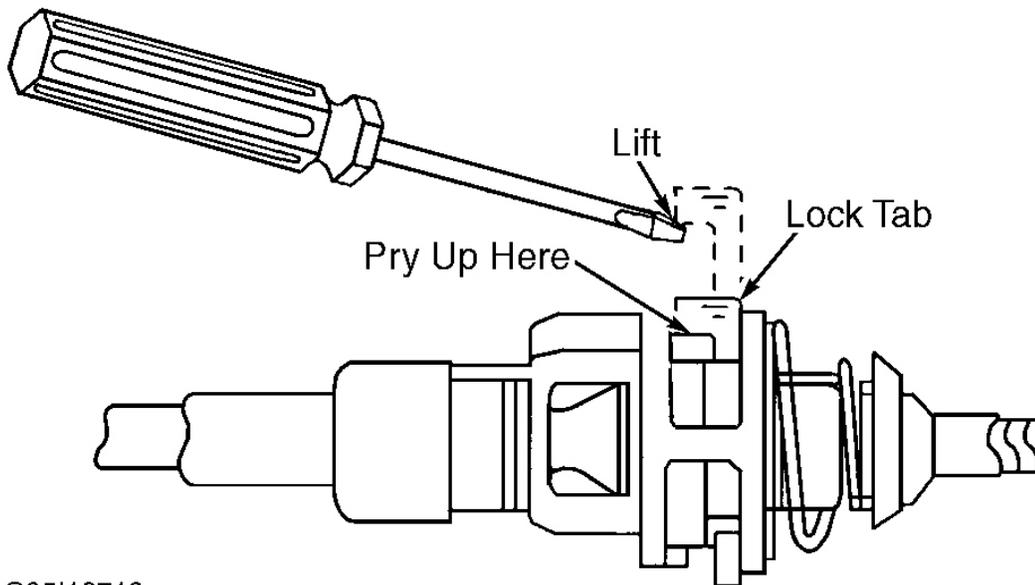
SHIFT CABLE (FWD)

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

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

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, in Park.
2. Using a small screwdriver, pry up cable adjuster lock tab. See **Fig. 16** . 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 the amount of total end play. Press lock tab down and ensure cable housing is secure. Check park lock cable adjustment. See **PARK LOCK CABLE (FLOOR SHIFT)** .



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Fig. 16: Locating Gearshift Cable Lock Tab (Saturn)
Courtesy of GENERAL MOTORS CORP.

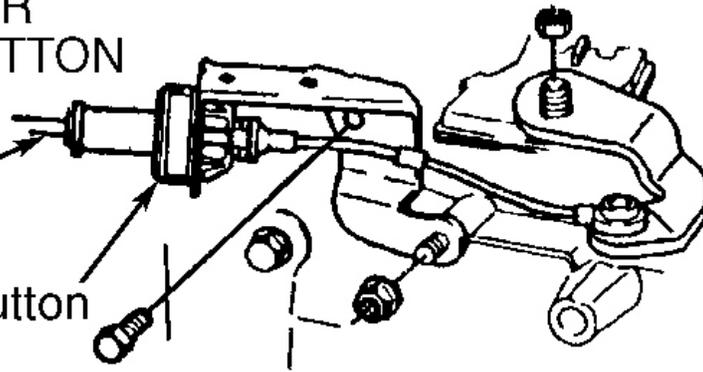
Except Saturn

Place gear selector lever in Neutral. Lift or press lock button on cable adjuster at transaxle mounting bracket. See **Fig. 17** and **Fig. 18** . Place transaxle lever in Neutral detent. Push down or release lock button.

PRESS OR
RELEASE BUTTON

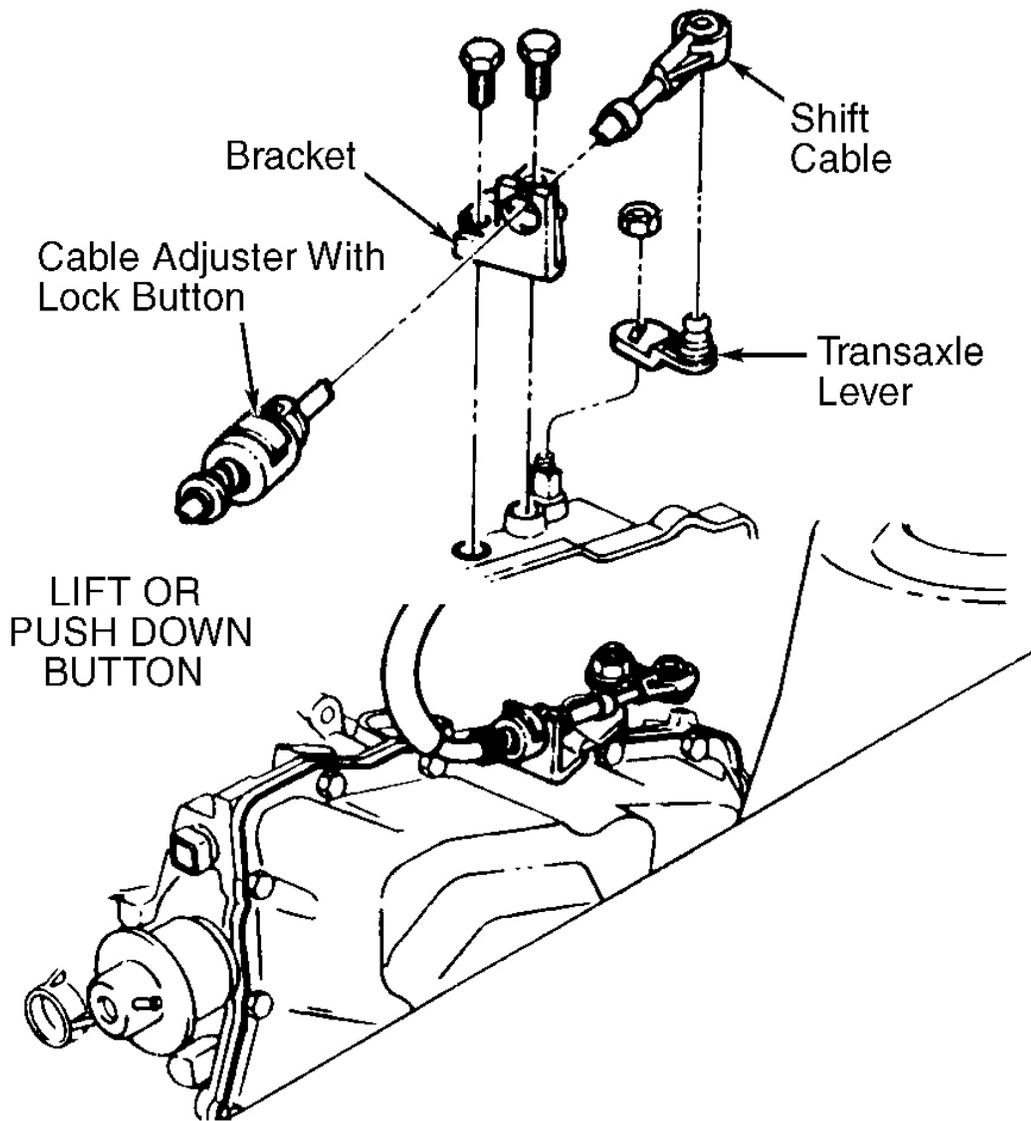
Shift Cable

Lock Button



G95H13703

Fig. 17: Adjusting Shift Cable ("J" & "N" Bodies)
Courtesy of GENERAL MOTORS CORP.



G95113704

Fig. 18: Adjusting Shift Cable (Except "J" & "N" Bodies)
 Courtesy of GENERAL MOTORS CORP.

SHIFT CABLE (RWD)

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

CAUTION: To prevent transaxle damage on Camaro, Corvette and Firebird, hold lever

out of Park when tightening cable adjusting nut.

Camaro & Firebird

Place gear selector lever in Neutral. Raise and support vehicle. Loosen cable adjusting nut at transmission lever. See **Fig. 19** . Ensure shift shaft lever is in Neutral by rotating lever clockwise to Park detent, and then counterclockwise 2 detents to Neutral. Tighten nut (DO NOT tighten nut with lever in Park).

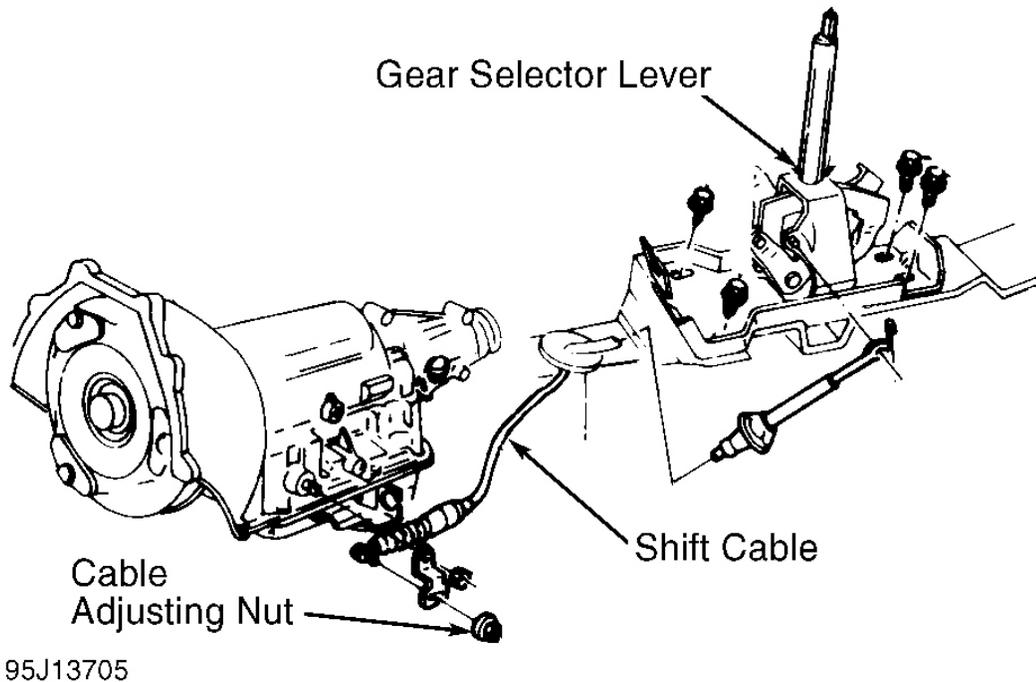


Fig. 19: Adjusting Shift Cable (Camaro & Firebird)
Courtesy of GENERAL MOTORS CORP.

Corvette

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. 20** .
2. Ensure gear selector lever and transmission shift lever are in Neutral. Press on shift cable lock to secure cable adjustment in place. Lower vehicle and check gearshift lever operation.

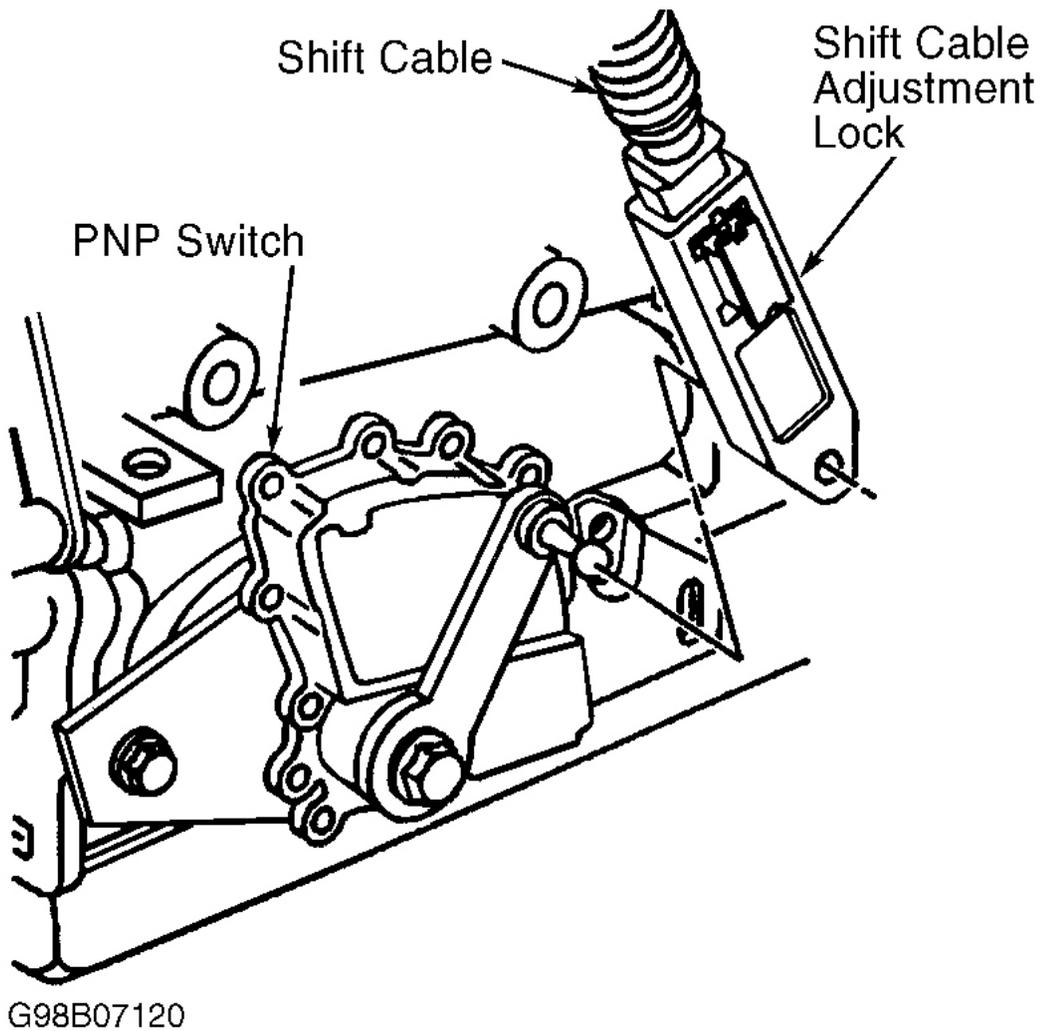


Fig. 20: Adjusting Shift Cable (Corvette)
Courtesy of GENERAL MOTORS CORP.

SHIFT LINKAGE ROD (RWD)

WARNING: Adjust shift linkage so engine will start in Park or Neutral only. Misadjusted shift linkage could cause clutch and/or band failure in transmission.

Catera

1. Position shift control lever in Park. Raise and support vehicle. Loosen shift linkage adjuster bolt from underneath vehicle.

2. Hold selector lever on transmission against rear stop to eliminate play. Tighten shift lever rod adjustment bolt to 71 INCH lbs. (8 N.m).

STOPLIGHT SWITCH

Except Saturn

Ensure brake pedal is fully released. Adjust switch until switch plunger just touches brake pedal lever.

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: It is important to 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. 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 (T.V.) CABLE

NOTE: T.V. cable is not used on electronically controlled models.

All Models (If Equipped)

1. Turn ignition off. Press and hold metal readjust tab on cable adjuster at cable support bracket on engine. See **Fig. 21** . 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.

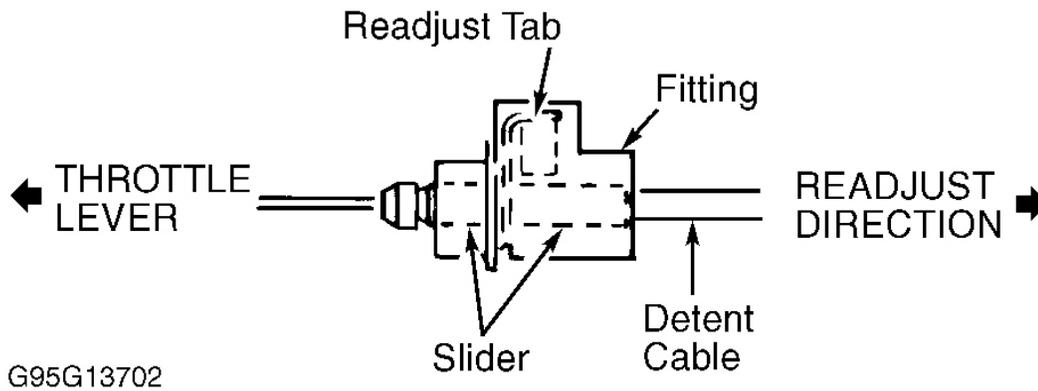


Fig. 21: Adjusting TV Cable
 Courtesy of GENERAL MOTORS CORP.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

Transmission	INCH Lbs. (N.m)
Oil Pan Bolts	
3T40, 4T40-E & 4T45-E	106 (12)
4L30-E	92 (11)
4L60-E	
Corvette	97 (11)
Except Corvette	144 (16)
4T60-E	150 (17)
4T65-E	97 (11)
4T80-E	106 (12)
Saturn	88 (10)
Oil Fill Plug	
4L30-E (Catera)	33 (45)
4L60-E (Corvette)	22 (30)