ENGINEERING ANALYSIS CLOSING REPORT

SUBJECT: Alleged Inadvertent and Sudden Vehicle Acceleration (SA) in Certain Nissan 280ZX and 300ZX Vehicles.

EA No.: EA85-029 Date Opened: 5/9/85 Date Closed: JUL 1 1 1989

BASIS: This Engineering Analysis (EA) was opened on the basis of information obtained in the Nissan Motor Corporation's (Nissan) response of January 31, 1985, to ODI's inquiry PE85-008 dated November 29, 1984.

THE ALLEGED DEFECT: Unexpected vehicle SA allegedly occurs in some subject vehicles when the automatic transmission lever is moved from "Park" to "Reverse" or "Drive," and the driver indicates that braking did not stop the vehicle.

DESCRIPTION OF COMPONENT OR VEHICLE SYSTEM: The subject vehicles are equipped with an automatic transmission and a cruise control system. Vehicle systems which have been suspected as having caused the SA and brake problems include fuel injection systems, accelerator pedal and throttle linkages, computerized control systems, cruise control systems, power brake systems, engine mounts, automatic transmissions, and floor mats.

CORRESPONDENCE:

NHTSA to Mfg.	Mfg. to NHTSA	Mfg. to NHTSA Supplement	Date Requested	Confidentiality Date OCC Response	Confidentiality Items Confidential
10/10/85	12/24/85				
4/09/86	6/30/86		6/30/86	9/3/86	Some Attach.
11/14/86	2/10/87	6/29/87	2/10/87	2/27/87	Item 11
05/24/88	08/16/88				

PROBLEM EXPERIENCE:

	STATUS EA OPENED		EA CLOSED	
Reports	ODI	MFG	ODI	MFG
Owner	13	48	67	225
Field	N/A	INC	N/A	INC
Lawsuits	0	6	0	21
Property Damage Accidents	9	35	51	220
Injury Accidents/ Injuries	3 3	13 20	22 25	34 42
Fatality Accidents/ Fatalities	1 2	1 1	1 2	3 3
Unknown Accidents				

A review of all complaint reports revealed the following:

1. Both numbers of SA incidents (when the incident allegedly occurred) and complaints (when the complaint report was dated) appear to be substantially reduced since July 1987 as shown in Figure 1 and 2. This indicates the Nissan safety recall campaign starting in June 1987 is effective.

2. Since July 1987, there have been 128 SA complaints received. Among those reports, ten involved SA incidents after the shift interlock system was installed in the vehicle. Figure 3 shows distribution of those complaints per month since June 1987. Nissan investigated the ten incidents and found that three vehicles had the shift interlock system improperly installed; four had the transmission already in "Drive" or "Reverse" at the time of incident and the shift interlock worked properly; the other three had no identifiable defects.

3. The majority of vehicle owners reported the SA incident occurred at 40,000 miles or less as shown in Figure 4.

4. The number of complaints (225) received from Nissan 300ZX vehicle owners (94,900 1984 through 1988 subject vehicles) is much higher than Datsun 280ZX complaints (63)(99,300 1979 through 1983 subject vehicles) as shown in Table 1. Note that the Nissan 300ZX vehicle has a larger engine (3 liter) than the engine (2.8 liter) in the Datsun 280ZX vehicle.

5. Although the majority of owners (182) described alleged SA similar to the alleged defect, many other owners reported different symptoms and possible causes. For example, 11 reported vehicle sudden acceleration occurred while driving; 37 mentioned vehicle SA happened in a stop and go situation; 2 complained of excessive high idle; 23 believe a stuck floor mat under the accelerator pedal was the cause of SA of their vehicles; 21 suspected stuck throttles and 5 reported cruise control system failure to be the cause of the alleged defect.

6. There were 142 drivers reporting vehicle SA occurred while the driver's foot was on the brake pedal; 27 on the accelerator pedal; and 16 on the floor.

VEHICLE POPULATION: According to Nissan, the number of 1980 through 1985 Nissan/Datsun 280ZX and 300ZX vehicles equipped with automatic transmission sold in the U.S. was about 194,000 units including 21,300 1979 models; 12,000 1980 models; 25,000 1981 models; 23,000 1982 models; 18,000 1983 models; 25,000 1984 models; 27,000 1985 models; 22,900 1986 models; 12,800 1987 models; and 7,200 1988 models.

WARRANTY: N/A.

SERVICE BULLETINS: N/A.

PART SALES: N/A.

DESIGN, MATERIAL, AND/OR PRODUCTION MODIFICATIONS: Nissan states in its letter of December 24, 1985, that "There have been no changes or modifications in the design, manufacture, attachment or composition of the throttle valve switch, the throttle chamber, the E.C.C.S. control unit, or floor mat in the subject vehicles related to the alleged problem."

TESTING: The NHTSA Vehicle Research and Test Center (VRTC) conducted inspections and tests on three 1985 Nissan 300ZX vehicles, one 1984 Nissan 300ZX, and one 1983 Datsun 280ZX to determine possible causes for the alleged SA of these vehicles; to evaluate their braking performance under conditions similar to the reported accidents; and to determine the possibilities and consequences of a driver overlapping the brake and accelerator pedals with the foot while attempting to brake. Results of tests showed:

1. Tests were performed only in the idle to wide open throttle (WOT) mode. The engine was at normal idle speed until the transmission was shifted into "Drive" or "Reverse," and then the throttle was opened rapidly and fully by the driver and kept open throughout the test run. All test vehicles except the 1984 Nissan turbo 300ZX would stop at the minimum brake pedal force (60 lbs.) and maximum brake pedal application delay time (2 sec.) baseline conditions when the power brake system was functioning normally. However, for the 1984 Nissan 300ZX with the turbocharged engine, a brake pedal force between 90 and 125 lbs. was required to stop the vehicle in "Drive." Only 60 lbs. pedal force was required for this vehicle in "Reverse" or for either gear at a brake application delay time of 1 second. For two 1985 Nissan 300ZX test vehicles, a brake pedal force (applied by the left foot) of 22 lbs. for one car and 40 lbs. for the other in "Drive," and 14 lbs. and 40 lbs. in "Reverse" applied simultaneously with the accelerator would hold the vehicle when the accelerator pedal was fully depressed (by the right foot) for approximately 5 seconds.

2. It was possible to overlap the brake and accelerator pedals and increase the engine speed while attempting to apply the brakes. Brake forces were sufficient to keep the test vehicles from moving when a brake pedal force between 25 and 75 lbs. was applied while overlapping the accelerator pedal.

3. The cruise control systems and the engine computer control systems in the test vehicles performed normally in all operational modes (Set, Coast, Resume, Accel, On/Off) and under various test conditions.

4. The maximum engine speed noted was 1,800 rpm (in Drive) during simulated failures of various engine components, including misadjusting the throttle valve switch, using an air by-pass hose around the air regulator, P.C.V. valve and idle-up solenoid valve, and an intermittent spark plug wire failure. No instances of unexpected vehicle acceleration were observed or experienced.

5. The VRTC asked each of 49 male and female drivers to drive a 1985 model Nissan 300ZX and observed each driver's driving habits. About 67 percent of the 49 drivers in the driving test started the test vehicles with their foot on the accelerator pedal. Approximately 71 percent of the 36 male drivers found it easy to overlap the brake and accelerator pedals.

6. No instances of unexpected vehicle acceleration were observed or experienced on any test vehicles.

7. There is no evidence of braking effectiveness loss in any test mentioned above.

8. In two 1985 Nissan 300ZX test vehicles, the brake pedal free height and depressed height were found to be about 1/4 to 3/4 inch lower than manufacturer specifications.

The test results are described in detail in three VRTC final test reports dated March and November 1986, and January 1987.

Two ODI contractors, GAB Business Services, Inc., and Equifax Services, Inc., inspected and tested three Nissan 300ZX vehicles (1984, 1985, and 1986 model years) involved in alleged sudden vehicle acceleration accidents. They were unable to reproduce sudden vehicle acceleration on any of these cars, or to find any malfunction/failure of devices or components which may cause sudden vehicle acceleration. Additionally, the brake system operated normally in each of the tested vehicles.

An accident investigation report received from KESCORP Knight Engineering Services, concerning an alleged sudden vehicle acceleration accident involving a 1986 Nissan 300ZX car, dated December 12, 1986, stated in part that "Based upon the findings of this investigation, conclusions were established as follows:

1. No malfunction of mechanical components was found on the vehicle.

2. The initial cause of rearward acceleration was, in all probability, inadvertent pressing of the accelerator pedal by Mrs. Funk, who believed she was pressing the brake pedal."

Nissan has conducted many tests on the subject vehicles concerning the effects of electromagnetic interference (EMI). In its letter of June 30, 1986, Nissan stated that "Results of electromagnetic field surveys, which have been conducted in the U.S. and Japan, EMI road-testing in the U.S., EMI vehicle testing in a test chamber, and vehicular component testing as a means of determining relative component immunity of EMI did not reveal

any adverse effect of electromagnetic interference to the operation of subject vehicles and its devices." Nissan also stated in its letter of December 24, 1985, that "Tests results showed that electromagnetic interference has no effect on the ASCD (Automatic Speed Control Device)." Nissan described in its letter of June 30, 1986, certain EMI reduction techniques were used in the engine control system and ASCD control systems in the subject vehicles.

Nissan, during the development process, regularly conducts testing to confirm that components of the ASCD meet specifications. Results showed they passed the specifications. (Letter of June 30, 1986.)

Nissan conducted several tests on a Nissan 300ZX and demonstrated that the brakes will override and control a wide open throttle condition. A few male and female test drivers were used in this test program. The test procedure is described as follows:

1. Shift the transmission from "Park" to "Drive," then use a remote control device to generate a WOT condition. Let the vehicle accelerate for two seconds (about 20 mph), instruct the driver to apply the brakes (still under WOT condition) and stop the vehicle.

2. Repeat item 1 except shift the transmission from "Park" to "Reverse."

3. Shift the transmission from "Park" to "Drive" while depressing the brake pedal, then use a remote control device to generate a WOT condition. Instruct the driver to apply the brakes and hold the vehicle stopped.

The test results as shown in Table 1 and 2 indicate that the subject vehicle at WOT can be controlled by the brakes and will leave heavy braking skid marks.

In summary, both ODI and Nissan test and vehicle inspection results showed that the tested and inspected vehicles did not exhibit any condition that would cause the vehicle to accelerate at a high rate on its own, and the tested vehicles with the wide open throttle condition can be controlled by applying the brakes.

NISSAN SAFETY RECALL: Nissan notified ODI in its letter dated June 29, 1987, that it will conduct a voluntary safety recall campaign (87V-098) on all 1979 through 1983 280ZX and 1984 through April 1987 production 300ZX vehicles equipped with an automatic transmission. A shift interlock system will be installed in these vehicles to prevent the transmission shift lever from being moved from the "Park" position unless the brake pedal is depressed. A copy of Recall Campaign Bulletin 87SIS dated July 1, 1987, is shown in Attachment I.

WARNING SYMPTOMS: There are no warning symptoms before the alleged sudden vehicle acceleration occurs.

CONTRIBUTING FACTORS: Nissan made a theoretical analysis pertaining to the subject vehicle components which, if a malfunction were to occur, could affect the operation of the throttle control or idle control system, whether or not such malfunction might cause inadvertent vehicle SA. The malfunctions analyzed include (a) improper return of the throttle; (b) malfunction of the Idle Speed Control System including engine speed increase caused by electrical malfunction or interference, mechanical malfunction, or upon shifting transmission gear; (c) malfunction of automatic speed control device; (d) catching of accelerator pedal by the floor mat; and mis-depressing the brake and accelerator pedals. A copy of the detailed analysis in Nissan's letter of December 24, 1985, is shown in Attachment II.

The following discussion concerns certain devices and systems in the subject vehicles, which were suspected as possible source(s) of causing sudden vehicle acceleration.

1. ENGINE CONTROL SYSTEM: The sudden vehicle acceleration involves sudden and substantial increase of engine power. Basic internal combustion engine principles dictates that an engine's power is limited by the quantity of air and fuel it can take in for combustion within a very short period of time. An engine can only burn fuel in a very narrow air/fuel ratio range. A too rich or lean mixture will cause a rough or engine stall condition. A significant increase in engine power requires significant increase of air intake combined with a proper amount of fuel. This can be only accomplished in the subject vehicles by widely opening the throttle plate inside the throttle chamber. The only systems that can open the throttle plate widely in the subject vehicles are the throttle system and the ASCD. Both systems are described in the following sections.

2. THROTTLE SYSTEM: The throttle system consists of the accelerator pedal, accelerator cable, throttle chamber, ASCD actuator and its cable. When the ASCD in not engaged, the throttle system is operated by depressing the accelerator pedal, which in turn pulls on the accelerator cable attached to the throttle chamber bell crank. The bell crank then rotates the throttle plate inside the chamber allowing air to pass into the intake manifold. When the foot pressure is released from the accelerator pedal, the return springs on the throttle chamber and the accelerator pedal produces a spring force which closes the throttle plate.

   For those subject vehicle equipped with ASCD, the ASCD actuator and cable are attached to another bell crank on the throttle chamber, which is separated from the bell crank connected to the accelerator pedal. The ASCD operates only when it is actuated. When vacuum is released from the ASCD actuator, the return springs on the throttle chamber produce a spring force which closes the throttle plate.

The throttle plate can be widely opened under one of the three conditions: (1) an external force is applied to the accelerator pedal; (2) the ASCD actuator is operating; and (3) the throttle cable or plate became stuck, which has not been observed in any inspected or tested subject vehicle.

3. ELECTRICAL/ELECTRONIC SYSTEMS: There are two electrical/electronic systems in the subject vehicles which control fuel injectors and mechanical devices capable of opening the throttle valve (plate) or otherwise capable of allowing large amounts of air getting into the intake manifold. One is the Electronic Fuel Injection system (EFI) which controls fuel injectors allowing proper amount of fuel to be injected. The other is the ASCD which will be described later.

   The EFI on the subject vehicles controls the idle speed and cold start idle speed. It also meters the air flow and fuel through the electronic control unit (ECU). The ECU is designed to compare the volume of air that enters the intake manifold, along with other sensor inputs, against stored air/fuel quantity, and then meter the correct amount of fuel and correct volume of air. If non-metered air enters the manifold that is not measured by the air flow meter, then the ECU is not aware of the added air and will not command the fuel injectors to add fuel. Under this condition, the engine will run in a lean condition which will lead to a rough running engine. The rough engine running condition also can occur when too much fuel is added to a specific volume of air producing a rich condition. Both lean and rich conditions can not suddenly increase engine power.

   The cold start idle is controlled by the air regulator which allows a higher than normal idle for engine warm-up during cold weather. This is similar to a choke mechanism on a carbureted engine.

   The idle is controlled by an idle up solenoid (VG30E) or the auxiliary air control (VG30ET). Both devices allow the engine to maintain a stable idle and are controlled by signals from the ECU.

   If both the air regulator and the idle speed control devices fail or malfunction, a maximum of 2,500 rpm in "Neutral" could be obtained. When the transmission is placed into "Drive" or "Reverse," the engine speed drops to 1,600 rpm. Under this condition, the vehicle is easily held at a stop position by applying the brakes.

   Based on the above, it is concluded that no significant increase in engine power could possibly result from failure or malfunction of the ECU. Further, none of the incident vehicles inspected by ODI and/or Nissan exhibited any ECU failure or malfunction.

4. ASCD: The ASCD allows the vehicle to maintain a speed selected by the driver. The selected speed must be between the lower and upper limit of the ASCD operational speed envelope. Once a cruise speed has been selected, the cruise computer compares the selected speed to the actual vehicle speed. If the vehicle speed is higher or lower than the selected speed, the computer signals the ASCD actuator to open or close the throttle valve until the speed deviation is diminished.

   The ASCD system contains nine main components. These components and their functions are described in Table 3. Note that the ASCD normally cannot engage at a stand still or "Park" condition because many conditions must be met and many components must be used in order to engage the ASCD.

   The ASCD normally cannot cause inadvertent vehicle SA at vehicle start up from rest, since one or more of the following fail-safe conditions will apply:

   (1) The main electric source is automatically switched off when the ignition key is off. The ASCD main switch must be turned on each time the engine is restarted in order to use it.

   (2) If the brake or clutch pedal is depressed, the ASCD is deactivated.

   (3) Below the vehicle speed of 48 km/h for the 300ZX, and 60 km/h for the 280ZX, the ASCD computer deactivates the system.

   (4) When the transmission is shifted into "Reverse," the ASCD is ineffective at any vehicle speed.

   It is very unlikely that malfunction of the ASCD causes sudden vehicle acceleration from rest since all the above conditions would have to fail at the same time. Further, none of the incident vehicles inspected by ODI and Nissan have exhibited any ASCD malfunction or failure which could cause sudden vehicle acceleration.

5. BRAKE SYSTEM: The brake system is basically an independent mechanical system. It is a conventional hydraulic system with vacuum assist. ODI and Nissan have inspected many subject vehicles and have not found a vehicle with failed or malfunctioning brake system.

In summary, a mechanical or electrical/electronic failure or malfunction common to the subject vehicles, causing sudden unexpected vehicle acceleration with a simultaneous lack of braking system effectiveness, was not detected.

Available information indicates that inadvertent and unknowing driver application of the accelerator pedal when the driver intended to apply the brake appears to be the cause of many of the reported SA related accidents under several ODI incident investigations, even though many of the drivers continue to believe that they had been pushing on the brake pedal.

The disproportionately high sudden vehicle acceleration complaint rate for the subject vehicles may be associated partly with vehicle design characteristics and partly with a host of variables which influence owner behavior, perceptions, and propensity to report. A recent published report "An Examination of Sudden Acceleration Incidents" by the DOT Transportation Systems Center, Cambridge, Massachusetts, stated that most of the vehicles which have high sudden acceleration incident complaint rates have the following characteristics:

1. Relatively close lateral spacing between brake and accelerator, which increases the likelihood of pedal mistake and facilitates pressing both pedals with the same foot.

2. Relatively less vertical spacing between brake and accelerator, which increases the probability of confusion and facilitates pressing both pedals with the same foot.

3. Relatively long brake pedal travel (soft feel), which reduces the likelihood that the driver will recognize an error in time to avoid an accident and also reduces the amount of brake torque developed at any given value of pedal displacement.

4. Relatively powerful engine, which causes the consequences of an error to occur sooner and with greater kinetic energy.

The subject vehicles appear to have the above characteristics to certain degrees, which show in part in Figure 5, and in the test results and owner complaints described previously.

MANUFACTURER'S EVALUATION OF THE ALLEGED DEFECT: In the Recall Campaign Bulletin 87SIS dated July 1, 1987, Nissan states that "Some owners of 1979 through 1987 model 280ZX and 300ZX vehicles equipped with automatic transmission have reported incidents of unintended acceleration when shifting from the "Park" position. Reports of unintended acceleration are not unique to Nissan, but are known to involve many other automobile manufacturers.

Nissan has investigated these reports in 280ZX and 300ZX models and has confirmed that no general or specific vehicle defect exists. Nevertheless, in order to maintain the current high level of consumer satisfaction and confidence in the safety of 280ZX and 300ZX vehicles,

Nissan Engineers have developed a Shift Interlock System which prevents the transmission shift lever from being moved from the "Park" position unless the brake pedal is pressed. The brake system in 280ZX and 300ZX vehicles is the safety feature capable of overriding any increase in vehicle speed and controlling the movement of the vehicle.

All owners of the affected vehicles will be notified by letter to bring their vehicles to a Nissan dealer to have a Shift Interlock System installed. This service will be performed free of charge. . . . Nissan intends to conduct this voluntary notification program as a safety recall campaign."

REASON FOR CLOSING: Nissan conducted a safety recall campaign to install a shift interlock device on the subject vehicles. This should prevent shifting of the transmission gear from "Park" to any other positions when the brake pedal is not applied. The recall campaign (87V-098) appears to be effective. Additionally, a mechanical or electrical/electronic failure or malfunction common to the subject vehicles related to sudden unexpected vehicle acceleration with a simultaneous lack of braking system effectiveness was not detected during the course of this investigation. However, compared with some other vehicles, the subject vehicles appear to have relatively close lateral and vertical spacing between the brake and accelerator pedals, relatively long brake pedal travel (soft feel), and quiet powerful engines which are suspected of being major contributing factors in driver pedal misapplication. The pedal geometry problem is very complicated and much needs to be learned. Trade offs must be considered between more lateral and vertical spacing and the resultant increased brake reaction time. In an attempt to resolve these questions the agency is conducting pedal placement research. The consequences of pedal misapplication can be minimized by installing the shift interlock system. During the course of this investigation, no safety-related defect has been detected. Further commitment of resources to determine whether such a trend may exist does not appear to be warranted.

George Obriana — March 30, 1989
Safety Defects Engineer (Litigation) — Date

I Concur:

N H Kratzke — 3/30/89
Chief, Vehicle Control Branch — Date

L Brown — 3/30/89
Chief, Defect Evaluation Division — Date

[signature] — 3-31.89
Director, Office of Defects Investigation — Date

NISSAN MOTOR CORPORATION IN U.S.A.
Post Office Box 191
Gardena, California 90247-7638
Telephone: (213) 532-3111

RECALL CAMPAIGN BULLETIN

Reference:	Date:
Campaign Identification No.: 87SIS	July 1, 1987 87SIS

87V-098

VOLUNTARY RECALL CAMPAIGN,
1979-87 280ZX and 300ZX SHIFT INTERLOCK SYSTEM

AUTHORIZATION

Nissan Motor Co., Ltd., Tokyo, Japan, authorizes Nissan Motor Corporation in U.S.A. (NMC) to conduct a voluntary recall campaign on all 1979-83 280ZX and 1984 through April 1987 production 300ZX vehicles equipped with automatic transmission.

INTRODUCTION

Some owners of 1979-1987 model 280ZX and 300ZX vehicles equipped with automatic transmission have reported incidents of unintended acceleration when shifting from the "Park" position. Reports of unintended acceleration are not unique to Nissan, but are known to involve many other automobile manufacturers.

Nissan has investigated these reports in 280ZX and 300ZX models and has confirmed that no general or specific vehicle defect exists. Nevertheless, in order to maintain the current high level of consumer satisfaction and confidence in the safety of 280ZX and 300ZX vehicles, Nissan Engineers have developed a Shift Interlock System which prevents the transmission shift lever from being moved from the "Park" position unless the brake pedal is pressed. The brake system in 280ZX and 300ZX vehicles is the safety feature capable of overriding any increase in vehicle speed and controlling the movement of the vehicle.

All owners of the affected vehicles will be notified by letter to bring their vehicles to a Nissan dealer to have a Shift Interlock System installed. This service will be performed free of charge. A copy of the owner's letter is shown on page 24 for your information.

ATTACHMENT I

IDENTIFICATION NUMBER

Nissan has assigned identification number 87SIS to the campaign. This number must appear on all communications and documentation of any nature dealing with this campaign.

Note: The small number to the right of the bulletin date is the number sequence of the documents published for this campaign.

SERIAL NUMBER AND MODEL AFFECTED

All 1979-83 280ZX and 1984 through April 1987 production 300ZX with automatic transmission. See details below for VINs.

DEALER RESPONSIBILITY

1. It is the dealer's reponsibility to install a Shift Interlock System on each vehicle falling within the affected VIN range of this campaign which for any reason enters the service department. This includes vehicles purchased from private parties or presented by transient (tourist) owners and vehicles on dealer used car sales lots.

2. All owners of 1979-87 models within the affected VIN range will be notified on or after July 6, 1987.

3. The dealer must install a label under the hood (Figure 1), next to the Existing Emission Control Information label, when the correction has been completed.

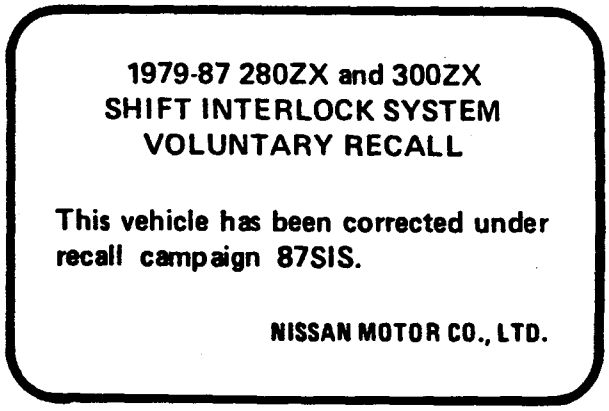


FIGURE 1

PARTS INFORMATION

Each Owner Notification identifies which kit applies to the vehicle. The kit identification letter designation follows the campaign number, e.g., 87SIS A, on the front of the notice. When an owner calls for an appointment, we suggest that you ask him to read the kit designation letter to you so that you can determine whether you have the appropriate kit in stock.

YEAR	MODEL	KIT	PART NUMBER
1979 1980 1981*	280ZX 280ZX 280ZX	A A A	34900-P7160
1981*	280ZX	E	34900-P7960
1981* 1982 1983	280ZX 280ZX 280ZX	B B B	34900-P9160
1984 1985	300ZX 300ZX	C C	34900-01P60
1986 1987	300ZX 300ZX	D D	34900-19P60

*Please see below for VIN information.

"A" Kit: 1979, 1980, 1981 280ZX Part No. 34900-P7160

BODY STYLE	ENGINE	YEAR	VIN RANGE
Two-Seater	Non-Turbo	1979	HLS130-100050 thru 164009
		1980	HLS130-190017 thru 229913
		1981	JN1HZ04S()BX-250021 thru 279567 JN1HZ04S()BX-400001 thru 403120
	Turbo	1981	HLS130 JN1CZ04S()BX } 250021 thru 279567 AND JN1CZ04S()BX-600001 thru 601076
Four-Seater	Non-Turbo	1979	HLGS130-100059 thru 130260
		1980	HLGS130-150020 thru 170351
		1981	HLGS130 JN1HZ06S()BX } 180040 thru 194629 AND JN1HZ06S()BX 400001 thru 401846

"E" Kit: 1981 280ZX Part No. 34900-P7960

BODY STYLE	ENGINE	YEAR	VIN RANGE
Two-Seater	Non-Turbo	1981	JN1HZ04S()BX-403121 thru 412339
	Turbo	1981	JN1CZ04S()BX-601077 thru 604893
Four-Seater	Non-Turbo	1981	JN1HZ06S()BX-401847 thru 407548

"B" Kit: 1981, 1982, 1983 280ZX Part No. 34900-P9160

BODY STYLE	ENGINE	YEAR	VIN RANGE
Two-Seater	Non-Turbo	1981	JN1HZ04S()BX-412340 thru 416757
		1982	JN1HZ04S()CX-430014 thru 466410
		1983	JN1HZ04S()DX-550006 thru 581753
	Turbo	1981	JN1CZ04S()BX-604894 thru 608101
		1982	JN1CZ04S()CX-620008 thru 629089
		1983	JN1CZ04S()DX-750006 thru 759059
Four-Seater	Non-Turbo	1981	JN1HZ06S()BX-407549 thru 411250
		1982	JN1HZ06S()CX-420007 thru 437225
		1983	JN1HZ06S()DX-500006 thru 512402
	Turbo	1982	JN1CZ06S()CX-600015 thru 604210
		1983	JN1CZ06S()DX-700012 thru 704118

"C" Kit: 1984, 1985 300ZX Part No. 34900-01P60

BODY STYLE	ENGINE	YEAR	VIN RANGE
Two-Seater	Non-Turbo	1984	JN1HZ14S()EX-000019 thru 033060
		1985	JN1HZ14S()FX-060005 thru 104109
	Turbo	1984	JN1CZ14S()EX-000014 thru 022358
		1985	JN1CZ14S()FX-060012 thru 072440
Four-Seater	Non-Turbo	1984	JN1HZ16S()EX-000020 thru 023239
		1985	JN1HZ16S()FX-040004 thru 060369
	Turbo	1984	JN1CZ16S()EX-000019 thru 000622
		1985	JN1CZ16S()FX-010008 thru 010462

"D" Kit: 1986, 1987 300ZX Part No. 34900-19P60

BODY STYLE	ENGINE	YEAR	VIN RANGE
Two-Seater	Non-Turbo	1986	JN1HZ14S()GX-130004 thru 167592
		1987	JN1HZ14S()HX-200009 thru 215331
	Turbo	1986	JN1CZ14S()GX-100007 thru 109202
		1987	JN1CZ14S()HX-150017 thru 152920
Four-Seater	Non-Turbo	1986	JN1HZ16S()GX-080002 thru 095903
		1987	JN1HZ16S()HX-120007 thru 126530
	Turbo	1986	JN1CZ16S()GX-020001 thru 020634
		1987	JN1CZ16S()HX-030004 thru 030167

PARTS ORDERING GUIDELINES

Because of the number of different kits, and to avoid parts shortage, each dealer is advised to make an initial order of 25 kits, proportioned as follows, for each 100 vehicles for which he is responsible:

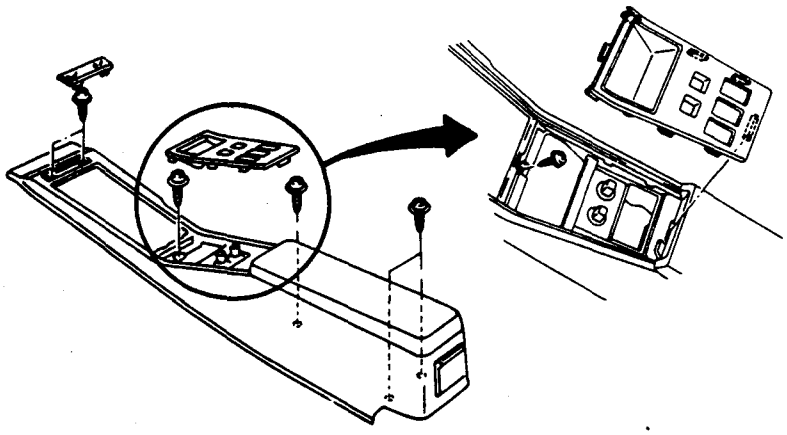
Kit	Number
A	5
E	1
B	4
C	7
D	8

The dealer can determine the number of campaign vehicles assigned to him from the attached Recall Status Report, which also lists any other outstanding campaigns on these vehicles. **Because of a limited supply of "E" kits, it is essential that each dealer order no more than one unless more than one owner of a vehicle needing an "E" kit makes an appointment.** Initial demand may differ from the above proportions due to variations in dealer sales. Follow-up orders should be based on actual dealer demand and the number of customers who make appointments for service.

1. Write down the frequency numbers of all customer-selected, pre-programed radio stations on the electronic tune radio.

2. Remove the negative battery cable from the battery terminal.

3. Remove the center console box and finisher. Be especially careful to use a thin pry tool to remove the finishers--**avoid scratching or otherwise damaging the surface.**

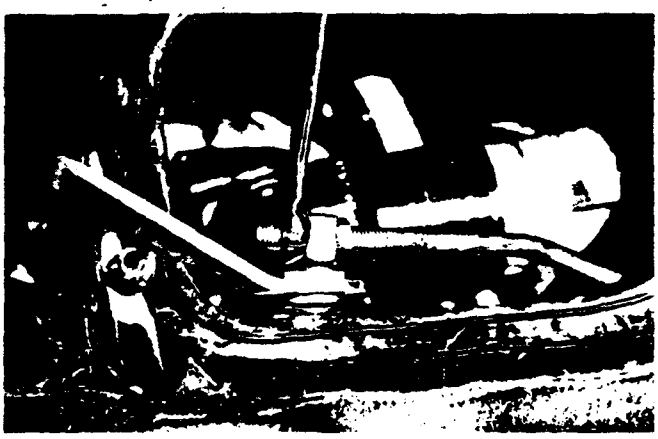


4. Disconnect the harness connectors for the shift position lamp and the O.D. indicator lamp.

5. Remove the control lever and gear indicator assemblies as a unit. Do not remove the shift lever knob at this time.

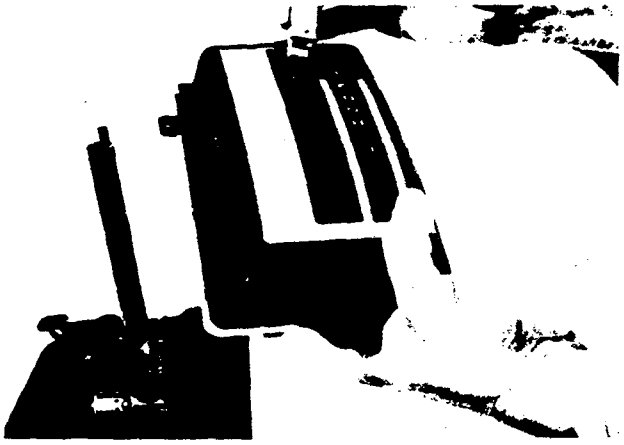
   A. Remove the screws from the gear indicator assembly and slide it back and forth to give access to the control lever assembly screws.

B. Remove the rear nut from the shift rod to release the control lever assembly. Do not remove the cotter pin. The linkage will have to be re-adjusted upon reassembly.



6. Take the control lever assembly to the bench. Use a fender cover or other pad to prevent scratches or damage to the parts as they are disassembled. Remove the shift knob and gear indicator assembly from the control lever assembly.

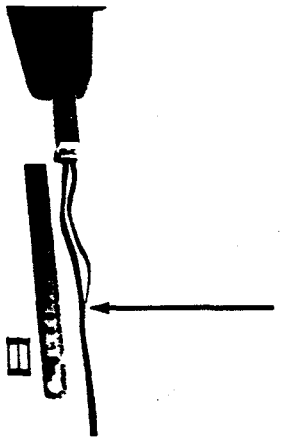
CAUTION: The shift button or its return spring may pop out when the knob is removed. Be sure you do not lose parts.



NOTE: The following three steps under "Install the harness guide" apply only to 1986-1987 vehicles. In 1984 and 1985 models, the OD lamp is located in the console instead of the shift lever.

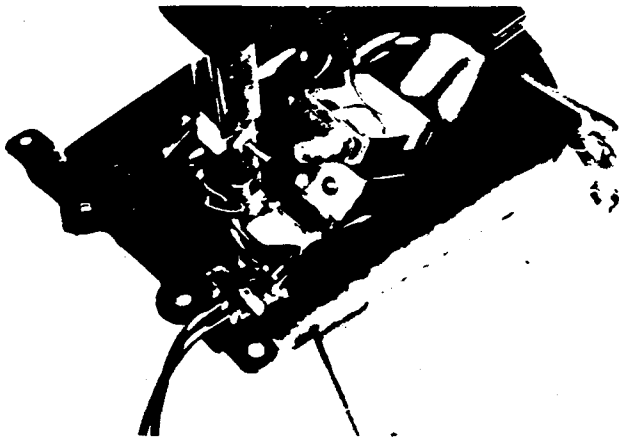
7. Install the "harness guide" onto the O.D. harness as follows:

   a. Measure the O.D. indicator lamp wires to establish a harness guide location that is exactly 115mm (4.50 in.) down from the shift knob, as shown in the illustration.

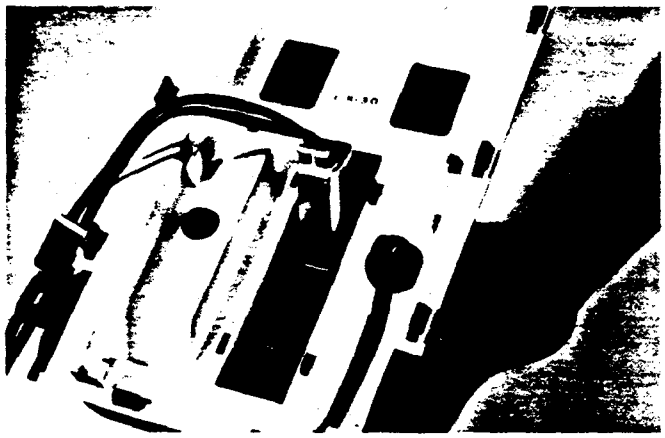


   b. Install the harness guide onto the wires. Wrap the assembly with vinyl electrical tape as shown.

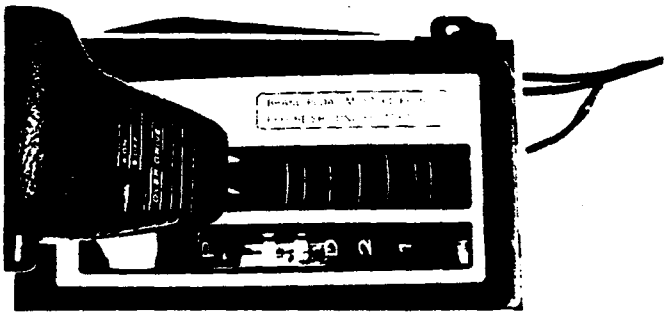
8. Assemble the gear indicator assembly and the shift knob to the new control lever assembly. Carefully route the O.D. harness in the control lever assembly as shown in the following illustration. Check to make sure no wires interfere with the movement of the levers.



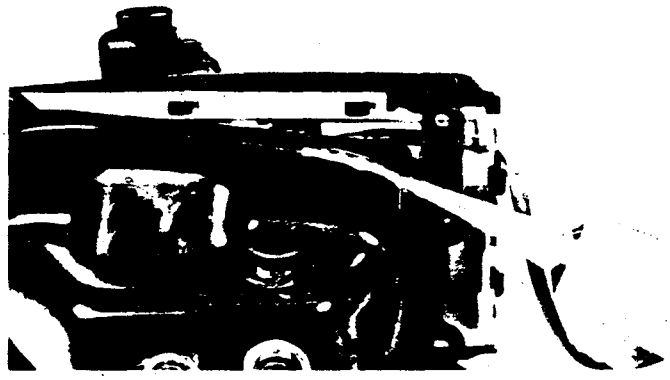
CAUTION: Be sure the shift shaft goes properly through the hole in the shift indicator pointer. Otherwise the pointer will be damaged when the lever is moved. Apply grease to the plastic wedge at the top of the shift control lever. Torque the shift knob screws to 26 kg/cm (22 in/lb)



9. With clean hands, place the interlock information label onto the top of the gear indicator assembly as shown in the illustration below. It should be placed so that it may be read easily from the driver's seat, 8mm (5/16") up from the rear edge and 5mm (3/16") from the passenger side edge.



10. Put a small bead of High Temperature RTV sealant, about 2mm (3/16") in diameter, all around the shift control assembly gasket.

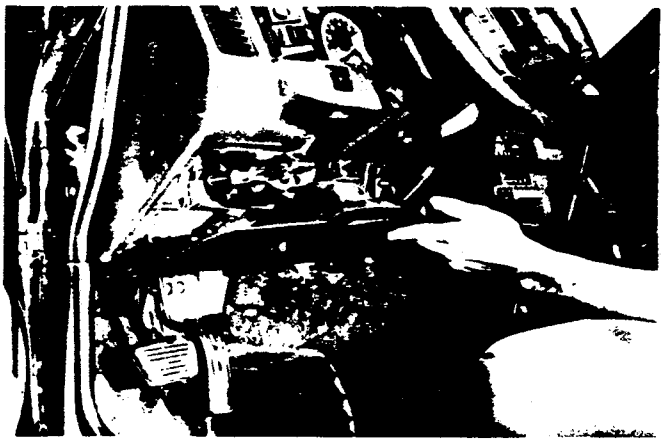


11. Check around the shift control assembly mounting screw holes in the vehicle to see if the sheet metal has been pulled up or deformed. If there are bulges in the metal, use a small hammer to pound them flat.

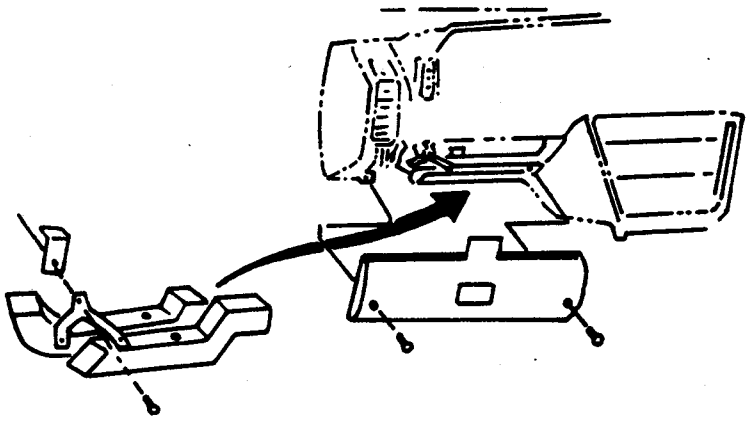
    Install the new shift control assembly back into the vehicle. Be sure the shift indicator lamp harness is routed properly on the under side of the indicator assembly. Place the shift rod into the shift lever and install the nut, but do not tighten. The rod must be adjusted from beneath the vehicle. Use the screws with sealant coated threads from the kit to bolt the shift control assembly back in place.

Sealant coated screw for bolting down shift control assembly.

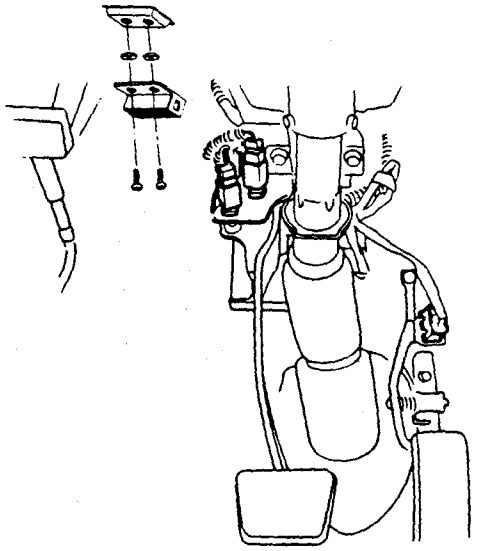
12. Remove the instrument lower cover on the driver's side.



13. Remove the side and foot air ducts.

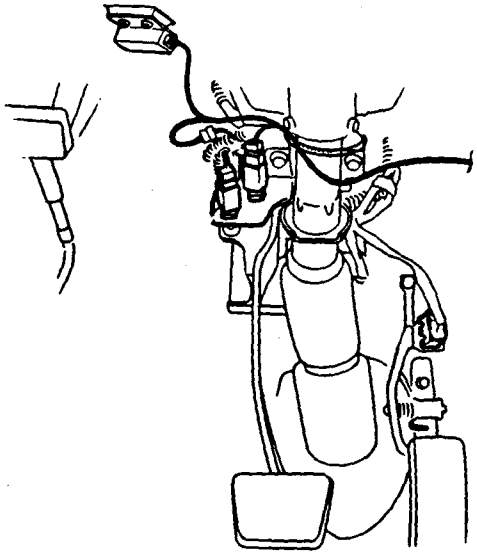


14. Locate the two threaded holes, high and to the left under the dash, for the A/T controller. Use the fiber speed nuts to hold the new bolts in the controller bracket for installation. Install the controller.

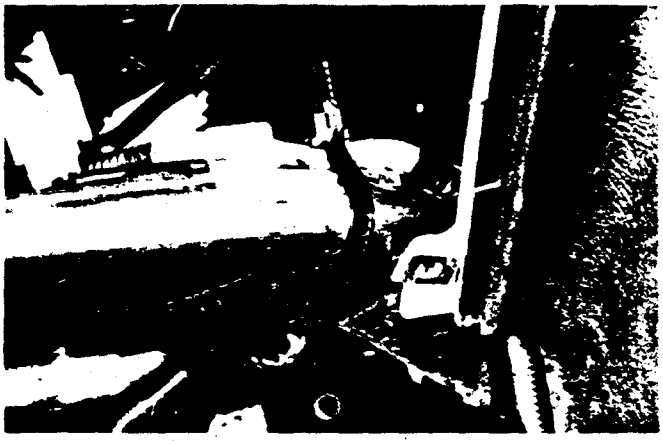


15. Disconnect the brake switch connector.

16. Install the A/T control harness as shown in the following illustration. Plug the upper end connector into the controller. Plug one connector into the brake switch and the other into the brake harness connector. Route the A/T control harness down the steering column and install a tie wrap. Re-install the side and foot air ducts.



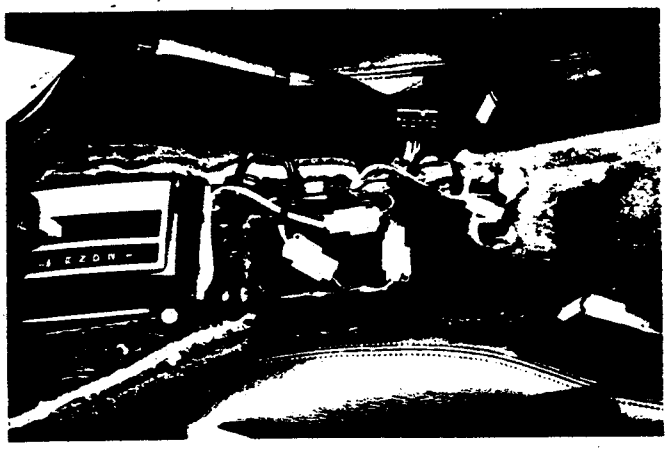
From the steering column, the harness should be routed across the side and foot ducts. Install another tie wrap as shown.



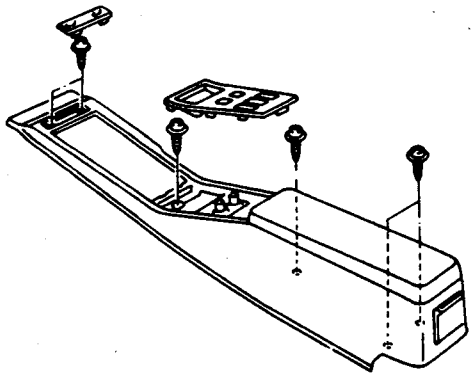
Bring the harness back along the driver's side of the transmission tunnel and tape it down firmly with the one-sided tape strips supplied in the kit.

CAUTION: Be careful when you pull up the carpet, especially the section under the radio at the top of the tunnel. It is held in place by Velcro, which could pull up with the carpet.

17. Plug the A/T control harness connectors in at the shift console. Make sure that wires and connectors will not interfere with the installation of the console box and finishers.



18. Re-install the console box and finishers. Make sure the carpeting is replaced firmly against the tunnel and that it is clean and flat.



19. Raise the vehicle on a hoist and adjust the shift rod according to the procedure given in the appropriate service manual.

20. Bring the vehicle back down. Attach the negative cable to the battery.

21. Test the interlock system by starting the engine with the transmission in "Park." Try to move the lever into "Reverse" and "Drive" with the foot brake applied. It should move. Then, with the engine at idle and the hand brake applied, try again to go from "Park" to "Reverse." The lever should not move. It should be possible to go from "Neutral" to "Drive" or "Reverse" without applying the foot brake. Make sure the shift lever has a normal "feel" as it moves from one gear to another. Turn on the air conditioning and check for air leaks at duct connections. Correct as necessary.

22. If the system works as it should, re-install the instrument lower cover. Check the interior over for any dirt or grease marks caused by the procedure. Clean as necessary.

23. Re-program the electronic tune radio stations as they were. Set the clock to the correct time.

24. Road test the vehicle to be sure no new squeaks or rattles were introduced by your procedure. Check carefully for any leaks of road or driveline noise or heat or vapors up through the console. Repair or re-fit as necessary.

25. Place the recall label under the hood next to the emissions label.

SERVICE PROCEDURE, 1979-1983 280ZX Models

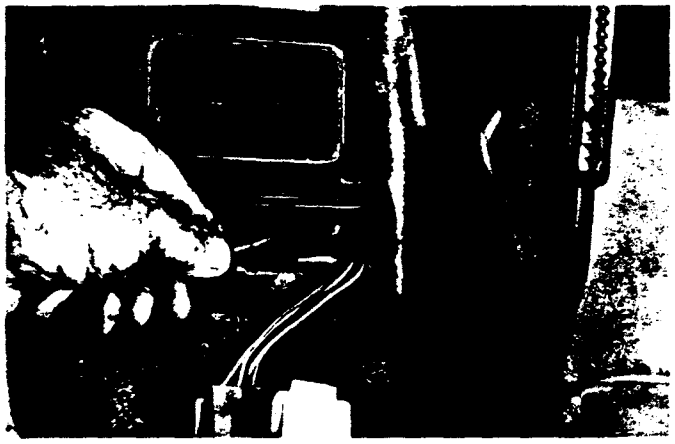
The service procedure for installing the shift/brake interlock system on 280ZX models is very similar to that used for 300ZX models, with some important differences. Therefore, please refer to the 300ZX procedure in this bulletin for detailed information on each step called out below. Wherever the procedure is different, we will give full details and illustrations below.

1. Write down the frequency numbers of all customer-selected, pre-programed radio stations on the electonic tune radio.

2. Remove the negative battery cable from the battery terminal.

3. Remove the center console box and finisher. Be especially careful to use a thin pry tool to remove the finishers--avoid scratching or otherwise damaging the surface.

4. Disconnect the harness connectors for the shift position lamp.



5. Remove the control lever and gear indicator assemblies as a unit. Do not remove the shift knob at this time.

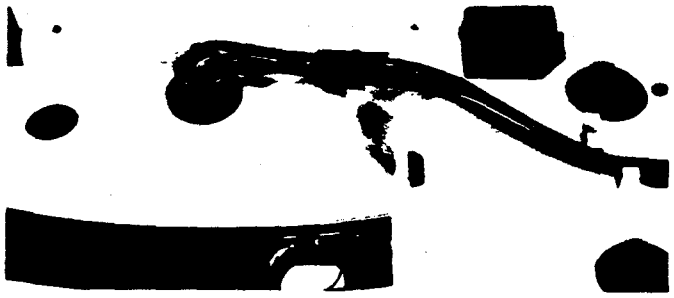
   A. Remove the screws from the gear indicator assembly and slide it back and forth to give access to the control lever assembly screws.

   B. Remove the rear nut from the shift rod to release the control lever assembly. **Do not remove the cotter pin. The linkage will have to be re-adjusted upon reassembly.**

6. Take the control lever assembly to the bench. Use a fender cover or other pad to prevent scratches or damage to the parts as they are disassembled. Remove the shift knob and gear indicator assembly from the control lever assembly.

   CAUTION: The shift button or its return spring may pop out when the knob is removed. Be sure you do not lose parts.

7. Use the adhesive backed metal clip to secure the shift indicator lamp wires to the side of the gear indicator as shown in the following photo. The idea is to make sure the wires are out of the way of the solenoid or mechanism in the control lever assembly.

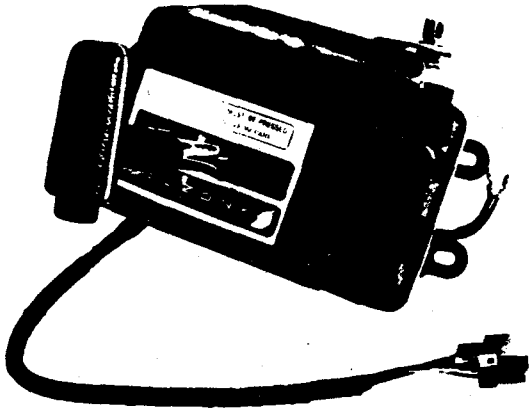


A. In some 1983 models (82/7 through 83/7 production), the shift indicator lamp is placed into a location at the end of the indicator assembly. In this case, use the plastic wire holder provided in the kit to route the wires away from the mechanism as shown below.

8. Assemble the gear indicator assembly and the shift knob to the new control lever assembly. Check to make sure no wires interfere with the movement of the lever or solenoid.

CAUTION: Be sure the shift lever goes properly through the hole in the shift indicator pointer. Otherwise, the pointer will be damaged when the lever is moved. Apply grease to the plastic wedge at the top of the shift control lever. Torque the shift knob screws to 26 kg/cm (22 in/lb).

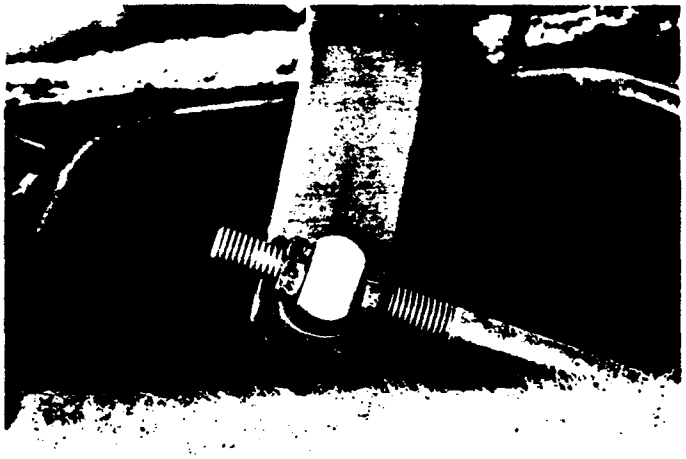
9. With clean hands, place the interlock information label onto the top of the gear indicator assembly as shown in the illustration below. It should be placed so that it may be read easily from the driver's seat.



10. Put a small bead of High Temperature RTV sealant, about 2mm (3/16") in diameter, all around the shift control assembly gasket.

11. Check around the shift control assembly mounting screw holes in the vehicle to see if the sheet metal has been pulled up or deformed. If there are bulges in the metal, use a small hammer to pound them flat.

    Install the new shift control assembly back into the vehicle. Be sure the shift indicator harness is routed properly on the under side of the indicator assembly and that the interlock harness is routed forward along the tunnel. Place the shift rod into the shift lever and install the nut. Center the lever in the shift rod threads as shown below and tighten the nut to 25-30 kg/cm (22-26 in/lb). (The shift rod may have to be adjusted again from beneath the vehicle.) Use the screws from the kit with blue sealant on the threads to bolt the shift control assembly back in place.

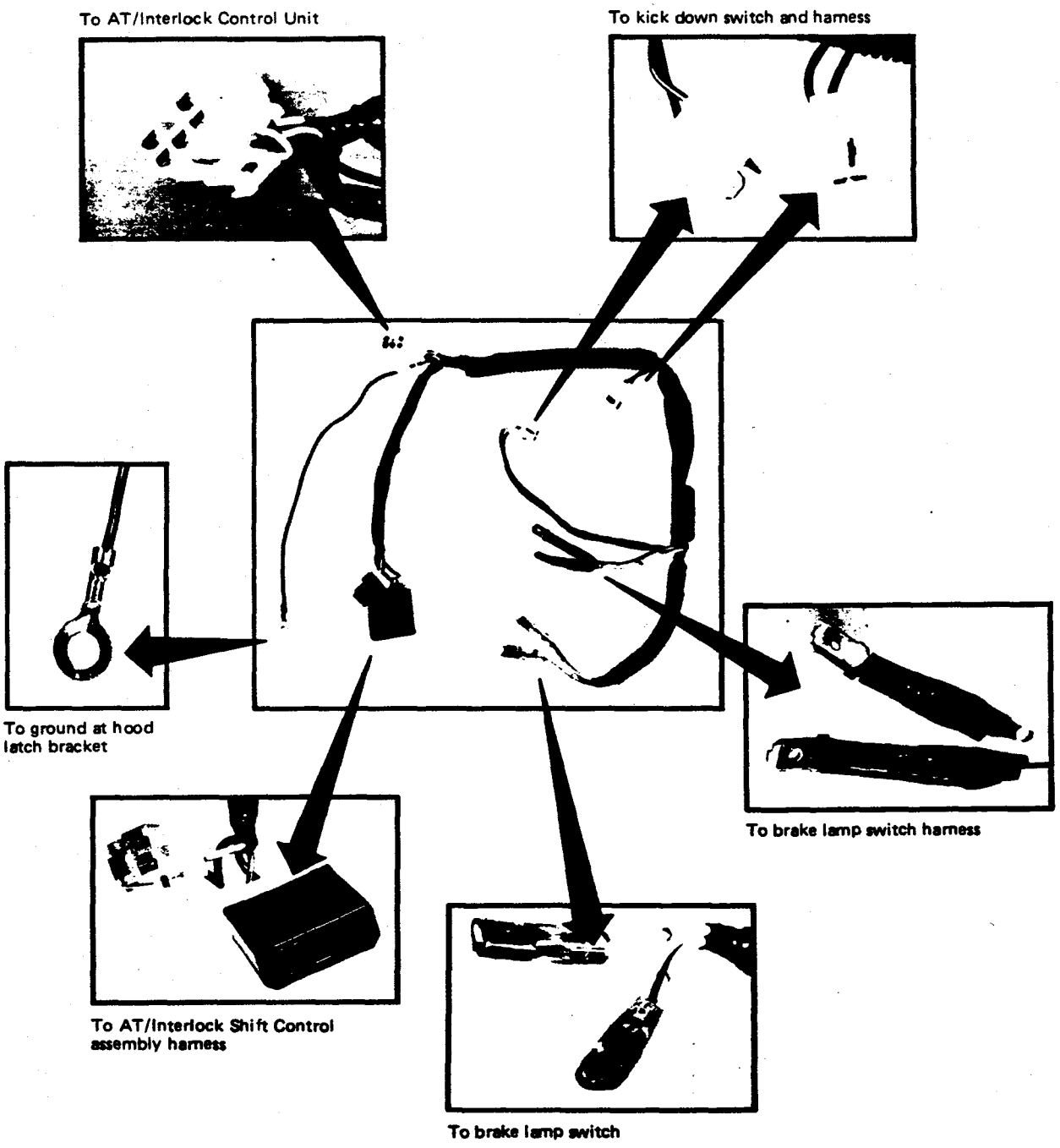


12. Remove the instrument lower cover on the driver's side.

13. Remove the driver's side foot air duct.

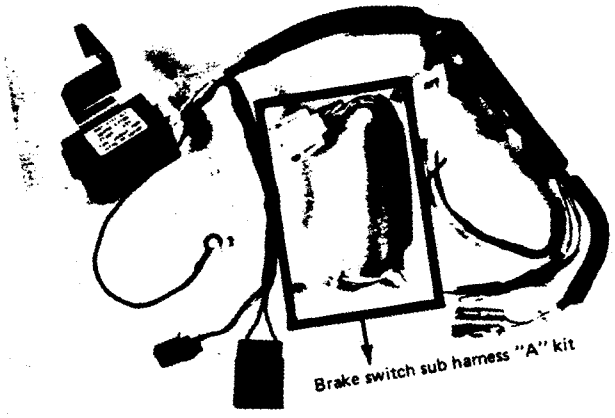
14. Install the A/T control harness as described in the following illustration.

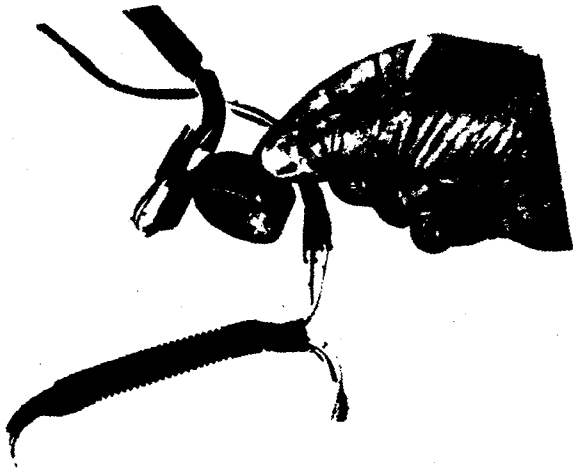
280ZX PARK/BRAKE INTERLOCK HARNESS



The eyelet goes to ground at the mount bolt for the hood latch. The six pin connector will plug into the interlock control unit. The two pin connectors go into the kick down switch and its harness at the top of the throttle pedal. The single spade connectors go into the brake light switch and its harness. The last two connectors plug into the interlock harness that comes from the shift control assembly.

NOTE: A brake switch sub-harness is supplied with the "A" kit that will allow for a plug in at the brake light switch on certain models. When it is required, the sub harness plugs into the interlock harness as shown in the following photograph. Tape the female side of the harness spade connectors up out of the way as shown.





15. After all connections are made, use a tie wrap to support the harness at the steering column. Route the harness carefully along the tunnel and apply one sided tape to hold it in place under the carpeting.

16. Install the driver's side foot air duct. The interlock control unit b up to the duct support. Route the interlock harness along the top of duct and tape it in place with one sided tape.

CAUTION: Be careful when you pull up the carpet, especially the se under the radio at the top of the tunnel. It is held in by Velcro, which could pull up with the carpet.

17. Re-install the console box and finishers. Make sure the carpeting is replaced firmly against the tunnel and that it is clean and flat.

18. Check the gear shift by "feel" to see that the lever moves positively into "Park" and out, and into each gear as it should. If necessary, raise the vehicle on a hoist and adjust the shift rod according to the procedure given in the appropriate service manual.

19. Attach the negative cable to the battery.

20. Test the interlock system by starting the engine with the transmission in "Park." Try to move the lever into "Reverse" and "Drive" with the foot brake applied. It should move. Then, with the engine at idle and the hand brake applied, try again to go from "Park" to "Reverse." The lever should not move. It should be possible to go from "Neutral" to "Drive" or "Reverse" without applying the foot brake. Make sure the shift lever has a normal "feel" as it moves from one gear to another. Turn on the air conditioning and check for air leaks at the ducts. Correct as necessary.

21. If the system works as it should, re-install the instrument lower cover. Check the interior over for any dirt or grease marks caused by the procedure. Clean as necessary.

22. Re-program the electronic tune radio stations as they were. Set the clock to the correct time.

23. Road test the vehicle to be sure no new squeaks or rattles were introduced by your procedure. Check carefully for any leaks of road or driveline noise or heat or vapors up through the console. Repair or re-fit as necessary.

24. Install the recall label under the hood next to the emissions label.

WARRANTY INSTRUCTIONS

With the direct entry capability of DATANET, special claim coupons will not be necessary. A peel-off label, imprinted with the owner's name, address, vehicle identification number, campaign description, and PNC replaces the campaign claim in the owner's notification package. Remove this label and apply it directly to the repair order to save the service writer's time and ensure accurate, readable information for entry to DATANET.

Dealers who are not using the DATANET system should submit a standard S-I-S Warranty Claim.

WARRANTY CLAIN INFORMATION

Model	CS	PNC	CT	OP CODE	FLAT RATE
1979-1983 280ZX	9Y	R7062	99	R70621	0.7/Hr.
1984-1987 300ZX	9Y	R7062	99	R70622	1.1/Hr.

NISSAN MOTOR CORPORATION IN U.S.A.
Technical Compliance Department

87V-098 (4)

1979-87 280ZX AND 300ZX SHIFT INTERLOCK SYSTEM OWNER NOTIFICATION

Dear Nissan Owner:

This notice is sent to you under the provisions of the National Traffic and Motor Vehicle Safety Act.

Some owners of 280ZX and 300ZX model vehicles equipped with automatic transmission have reported incidents of unintended acceleration when shifting from the "park" position. Reports of unintended acceleration are not unique to Nissan but are known to involve many other automobile manufacturers.

In order to maintain the current high level of consumer satisfaction and confidence in the safety of 280ZX and 300ZX vehicles, Nissan engineers have developed a Shift Interlock System which prevents the transmission shift lever from being moved from the "park" position unless the brake pedal is pressed. The brake system in 280ZX and 300ZX vehicles is the safety feature capable of overriding any increase in vehicle speed and controlling the movements of the vehicle. Unintended acceleration can result in a collision.

Please take your vehicle to your Nissan dealer to have the Shift Interlock System installed free of charge. In addition, please observe the following procedures at all times:

- When parking, make sure that you move the transmission shift lever into "park" and apply the hand brake.
- When starting the engine, ensure the transmission shift lever is in "park" wherever possible.
- After starting the engine, press the brake pedal before you shift out of "park".

In the event you experience unintended acceleration, press hard on the brake pedal with both feet and shift the transmission into neutral. If the engine is racing, turn your ignition key to the off position. Do not pull out the key, as this will lock the steering.

All authorized Nissan dealers have service instructions and parts to install the Shift Interlock System in your vehicle. This free service will take approximately one hour. Please make an appointment with your dealer and bring this notice with you when you keep your service appointment. It contains pre-printed claim information designed to help Nissan satisfy record-keeping requirements specified by the Federal Government.

87V-0965

If the dealer fails or is unable to install the Shift Interlock System free-of-charge, you should contact the Consumer Affairs Department of the appropriate Nissan regional office listed on the back of this notice. Or, you may contact the National Consumer Affairs Department, Nissan Motor Corporation in U.S.A. at P.O. Box 191, Gardena, CA. 90247, phone number (213) 532-3111.

You may also contact the Administrator of the National Highway Traffic Safety Administration, 400 Seventh Street, S.W., Washington, D.C. 20590; or call the toll-free auto safety hotline at (800) 424-9393 (Washington, D.C. area residents may call 366-0123).

Thank you for your cooperation. We urge you to take advantage of this free service and regret any inconvenience it may cause.

NISSAN MOTOR CORPORATION IN U.S.A.

(ii) If the brake or clutch pedal is depressed and the ASCD is not deactivated.

If the brake pedal is depressed, sufficient braking force is available to easily slow the vehicle. When the actual vehicle speed drops below a predetermined interval relative to the set speed, the ASCD will automatically deactivate. If the clutch pedal is depressed, the vehicle speed will slow gradually, and when it drops below a predetermined interval relative to the set speed, the ASCD will automatically deactivate. In no event will sudden vehicle acceleration result from this hypothetical condition.

(iii) When the vehicle speed is below 48 km/h for 300ZX, 60 km/h for 280ZX, and the ASCD control unit does not deactivate the system.

If the vehicle speed is below the minimum of 48km/hr. (or 56km/hr. - see note below) and the ASCD does not deactivate, the normal set and hold function could be performed at any speed below that minimum. The ASCD would then operate in the usual manner provided all other regular operating conditions were satisfied. In no event will sudden vehicle acceleration result from this hypothetical condition.

Note: In the previous response of December 24, 1985, under Item 18, it stated that the minimum set speeds were 48km/hr. for 300ZX, 60km/hr. for 280ZX. That should be amended to read: 48km/hr. for '82-'85 models, 56 km/hr for '80-'81 models.

11. Furnish the number of warranty claims related to the ASCD on the subject vehicles by model series, code, calendar month and problem code to date. Each problem claim code must be identified.

Attachment G contains the warranty claims related to the ASCD on the subject vehicles by model series, code, calendar month and problem code to date.

1. Improper Return of the Throttle Valve

This condition would result from the accelerator pedal being depressed, the throttle valve sticking in an open position and consequently failing to return as the pedal was released. A substantial and obvious restriction, however, would be required to overcome the closing torque of either of the two return springs in the throttle control mechanism. In none of the incident reports or investigations has there been any substantiated indication of such a condition following the incident. Therefore, this is not considered to be a cause of the alleged problem.

2. Malfunction of the Idle Speed Control System

This might result in:

(a) Engine Speed Increase Caused by Electrical Malfunction or Interference.

An increase in engine speed is possible if the FICD solenoid (used on all subject engines) operates abnormally and allow the maximum possible air flow through the idle system. Testing shows, however, that engine speed will reach no more than 1200 RPM in neutral under such conditions resulting in only slow acceleration upon "reverse" or "drive" engagement. Abnormal operation of either the idle up solenoid (used on VG30E engine) or the AAC valve (used on L28ET and VG30ET engines) will also result in engine speed of no more than 1200 rpm in neutral. Therefore, this will not cause the alleged problem.

Electromagnetic interference can affect engine driveability by causing rough idle, but cannot result in an increase in power or sudden acceleration.

(b) Engine Speed Increase Caused by Mechanical Malfunction.

Among the various devices of the idle speed control system, an air regulator with a broken bimetal or return spring will have the largest effect on idle speed. The highest attainable speed with such a malfunction, however, is 2500 RPM in neutral. This will result only in slow acceleration upon "reverse" or "drive" engagement and would not cause the alleged problem. In addition, such malfunctions would be readily apparent after a reported incident. None of the incident investigations found such a condition to exist.

(c) Engine Speed Increase Upon Shifting Gear

Some of the reported incidents allege sudden acceleration from rest in automatic transmission equipped vehicles. There is no vehicle component or system which can, by itself, cause an increase in engine speed upon shifting either a manual or automatic transmission into any gear. Torque convertor drag will cause a reduction in engine RPM when an automatic transmission equipped vehicle is shifted from 'P' or 'N' to 'R' or 'D'.

3. Malfunction of Automatic Speed Control Device

A malfunction of Automatic Speed Control Device (ASCD) cannot cause inadvertent vehicle sudden acceleration at vehicle start up from rest, since one or more of the following conditions will apply:

(a) The main electric source is automatically switched off when ignition key is off. The ASCD main switch must be turned on each time the engine is restarted.

(b) If brake or clutch pedal is depressed, the ASCD is deactivated.

(c) Below the vehicle speed of 48 km/h for the 300ZX, 60 km/h for 280ZX, the ASCD control unit deactivates the system.

A malfunctioning Automatic Speed Control Device might, in the course of routine operation, cause a moderate increase in vehicle speed or cyclical variations in cruising speed. However, the ASCD can be deactivated immediately and easily by:

(a) Lightly touching the brake or clutch pedal,
or
(b) switching off the ASCD main switch.

In addition to the above, testing shows that electromagnetic interference has no effect on the ASCD system.

Therefore, the ASCD is not considered a cause of the alleged problem.

4. Catching of Accelerator Pedal by Floor Mat

Nissan genuine floor mats are sized and shaped to fit the footwell area of specific models and minimize the possibility of pedal interference. The mats are made with hundreds of small projections on the bottom-side that engage the carpet fibers underneath to resist movement of the mat.

LETTER OF 12/24/85

16. The service manual of 1984 Nissan 300ZX, page EF and EC-2 Precautions, states in part ". . . When installing large capacity wireless equipment or a vehicle phone, be sure to observe the following as it may adversely affect electronic control systems depending on its installation location. . . ." if one or a few of the following were not observed and met, describe the adverse effects.

With regard to the above quoted portion of the 1984 Nissan 300ZX service manual, if large capacity wireless equipment is installed without complying with one or more of the items stated in the service manual, there is a possibility that an ignition misfire or change in the air-fuel mixture ratio may occur. This may result in poor driveability such as hesitation, rough idle, and/or lower engine performance. None of these would lead to an increase in engine power or a sudden acceleration.

17. Provide sample floor mats, one of each for the driver side on each of the model year subject vehicles.

Sample driver's side floormats designed and sourced by NMC USA of recent production are being provided. Earlier production floormats are no longer in inventory. Mats for the later model year 280ZX are interchangeable with earlier model years.

18. Furnish Nissan's opinion of the alleged problem on the subject vehicles. Please include an assessment of the following:

a. the causal or contributory factors which may result in the alleged problem;
b. the failure mode;
c. the risk to motor vehicle safety created by the alleged problem; and
d. any warning of the alleged problem.

A theoretical analysis has been made of those vehicle components which, if a malfunction were to occur, could affect the operation of the throttle control or idle control system of the subject vehicles, whether or not such malfunction might cause inadvertent vehicle sudden acceleration. Additionally, an evaluation has been made in light of the reported incidents, and testing has been performed as identified in response to Question No. 19 below. Based upon this analysis and evaluation, Nissan has found no cause relating to inadvertent vehicle sudden acceleration, except misoperation by the driver.

The following were considered as theoretically affecting the throttle control or idle control system:

ATTACHMENT II

Badly worn or grossly mispositioned mats can interfere with clutch, brake, or accelerator pedal functioning. However, on both the 280ZX and 300ZX models, Nissan floormats, when properly installed and maintained, will not slide out of position during normal vehicle operation. Non-Nissan floormats have not been evaluated, although a number of the reported incidents may be attributed to floor mats or carpet remnants not designed for use with the subject vehicles.

5. Mis-Depressing of Pedals

Two possible conditions were considered:

(a) Depressing the brake and accelerator pedals with the same foot results in an engine rpm increase but the vehicle will remain stopped. If, due to excessive wear or misadjustment, the brake pedal height is substantially lower than specification, depressing both pedals with the same foot may result in slow vehicle movement. In none of the reported incident investigations were these conditions found. In addition, it is our understanding that an NHTSA contractor evaluated control pedal performance on a number of foreign vehicles, including the Datsun 280ZX, and concluded that the vehicle would not move if both accelerator and brake pedal were simultaneously applied. See "Control Pedal Performance Evaluation - Foreign Vehicles" of September, 1984 done by Vehicle Research and Test Center, East Liberty, Ohio.

(b) Mistakenly depressing the accelerator pedal instead of the brake pedal can clearly result in unexpected sudden acceleration, particularly in an automatic transmission equipped vehicle resting in Park when the operator puts his/her foot firmly on the pedal just prior to shifting into 'R' or 'D'.

Based upon the above analysis and evaluation, Nissan has found no cause relating to the alleged problem except misoperation by the driver.

19. Furnish a copy of all documents not specifically requested which Nissan believes are relevant or were used in formulating its assessment of the alleged problem.

A copy of all documents not specifically requested which Nissan believes are relevant or were used in formulating its assessment of the alleged problem are contained in confidential Attachment 8.

ASCD Malfunction

6/30/86

10. Item 18, Section 3 of your letter dated December 24, 1985, concerning this matter states:

"3. Malfunction of Automatic Speed Control Device

A malfunction of Automatic Speed Control Device (ASCD) cannot cause inadvertent vehicle sudden acceleration at vehicle start up from rest, since one or more of the following conditions will apply:

(a) The main electric source is automatically switched off when ignition key is off. The ASCD main switch must be turned on each time the engine is restarted.

(b) If brake or clutch pedal is depressed, the ASCD is deactivated.

(c) Below the vehicle speed of 48 km/h for the 300ZX, 60 km/h for 280ZX, the ASCD control unit deactivates the system.

A malfunctioning Automatic Speed Control Device might, in the course of routine operation, cause a moderate increase in vehicle speed or cyclical variations in cruising speed. However, the ASCD can be deactivated immediately and easily by:

(a) lightly touching the brake or clutch pedal,

or

(b) switching off the ASCD main switch.

In addition to the above, testing shows that electromagnetic interference has no effect on the ASCD system.

Therefore, the ASCD is not considered a cause of the alleged problem."

Based on your reply please respond to the following:

a. Provide a copy of documents related to the tests which show that electromagnetic interference has no effect on the ASCD. The documents should include at least test procedures, conditions, vehicle(s) inspection, instrumentation, test results, test evaluation, and analysis.

A copy of documents related to the tests which show that electromagnetic interference has no effect on the ASCD has been previously provided. Please refer to the replies to Items 4 and 5 and also to Attachment 8 sent to NHTSA on December 24, 1985.

b. Furnish Nissan's analyses and assessment on the following:

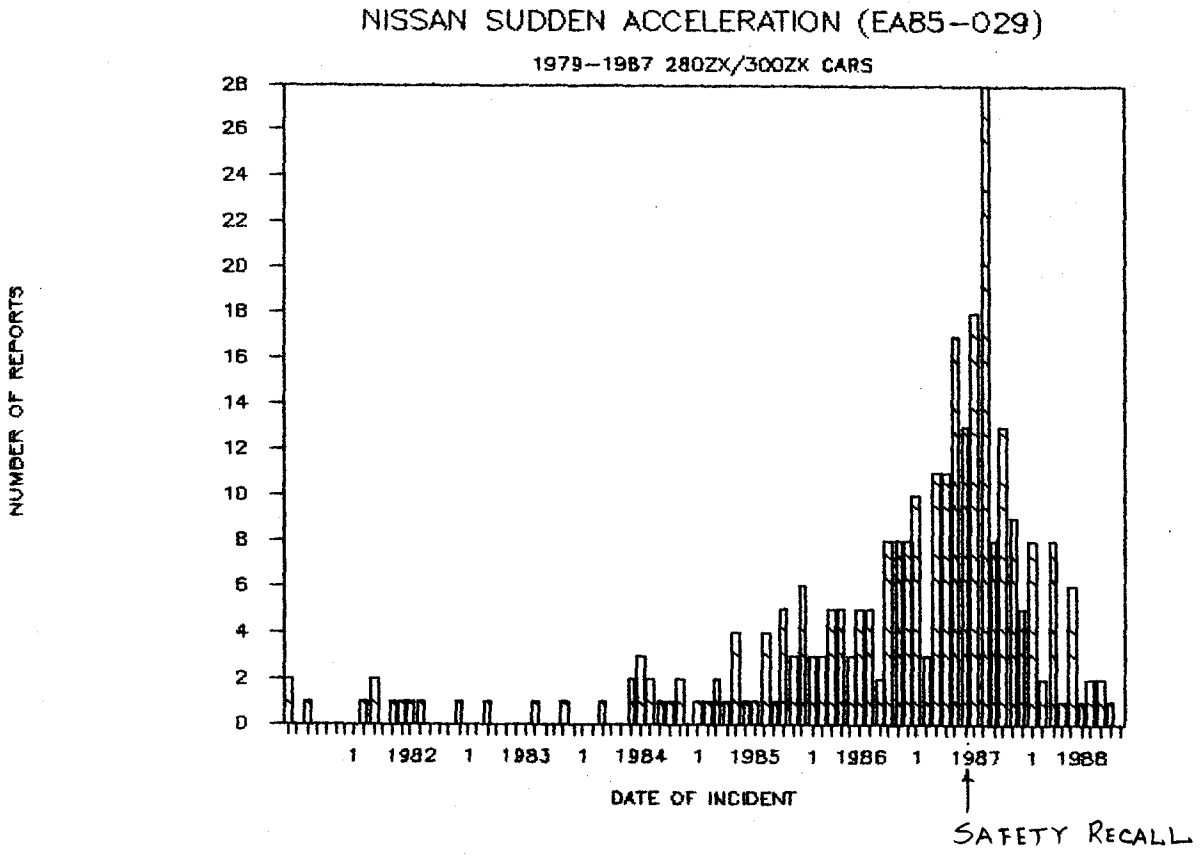
(1) State whether a malfunction of ASCD can cause inadvertent vehicle sudden acceleration at vehicle start-up from rest if for some reason the conditions a., b., and c. are not satisfied.

We know of no malfunction of the ASCD which even when combined with a,b, and c not being satisfied, could cause unwanted acceleration from rest. In addition, any occurence of a, b or c not being satisfied could only result from malfunctions which would be evident upon inspection following such occurence. None of the incident vehicles inspected by Nissan have exhibited any malfunctions of that kind.

(2) Describe possible conditions and failure modes which may result from each of the following:

(i) When the ignition key is off and the ASCD main switch is still on.

When the ignition switch is off, no current can be supplied to the ASCD because the current source for the ASCD is the ignition switch. If the ignition switch is turned on with the ASCD switch for some reason already in the 'on' condition, the ASCD could then be set in the usual manner at any desired speed within the normal cruising range without first turning on the main switch provided all other regular operating conditions were satisfied. In no event will sudden vehicle acceleration result from this hypothetical condition.



TOTAL : 288

183,519 1979-1987 280ZX/300ZX Cars involved.

FIG. 1. NUMBER OF INCIDENT REPORTS VS. DATE OF INCIDENTS

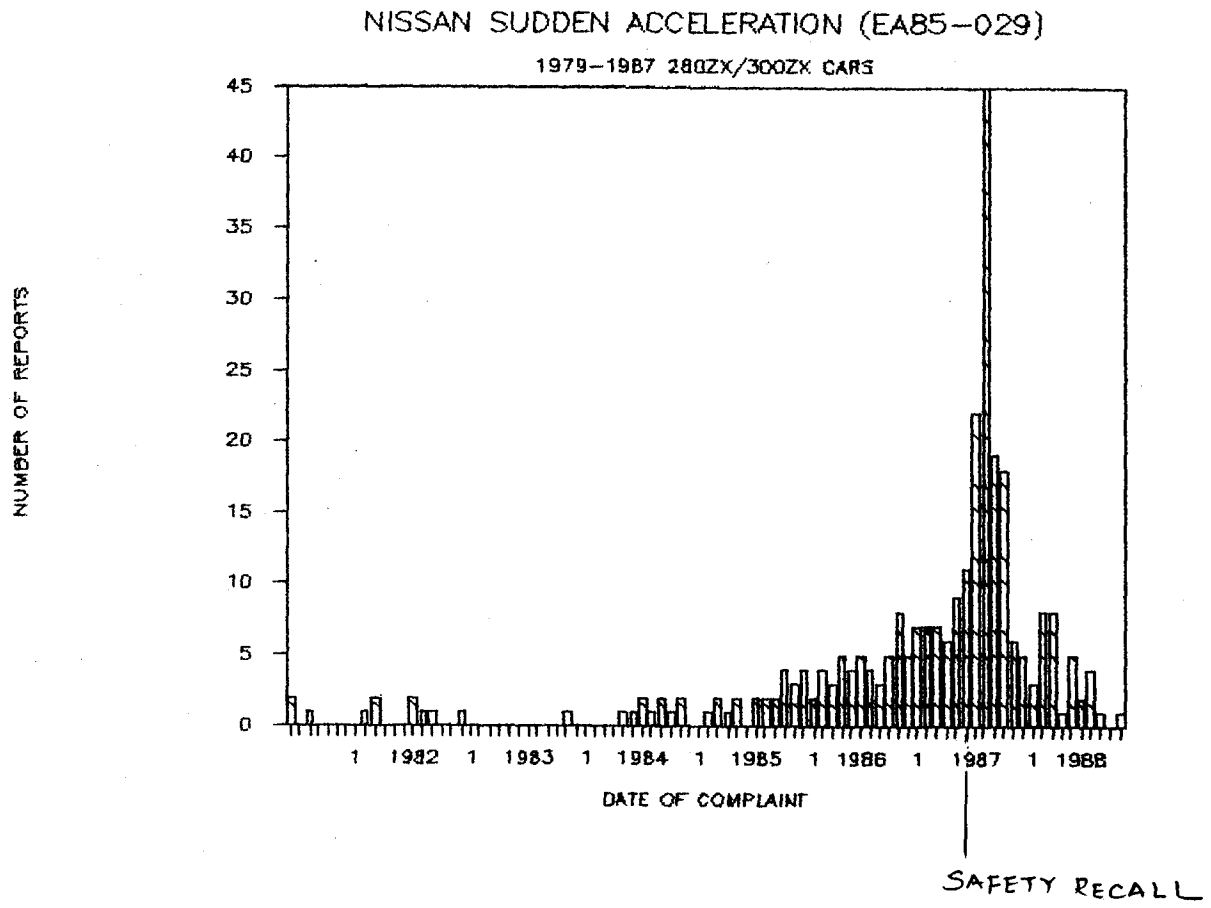
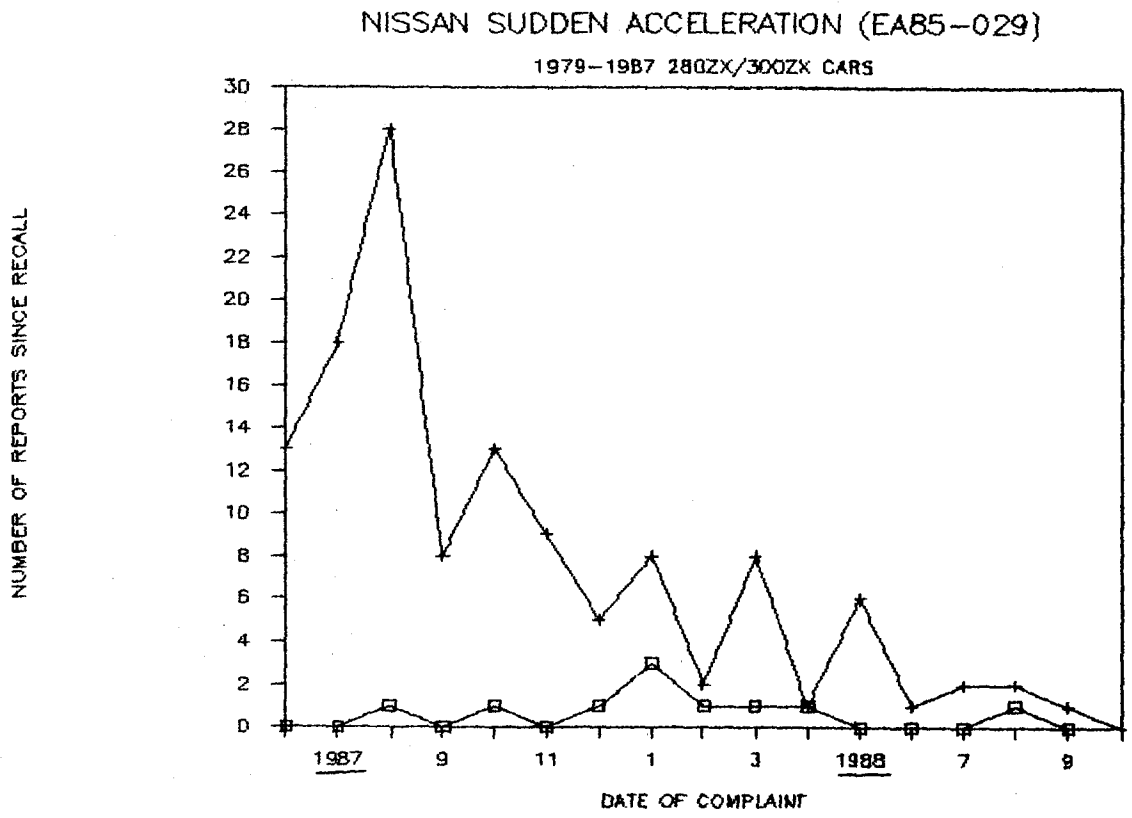


FIG. 2. NUMBER OF COMPLAINT REPORTS VS. DATE OF COMPLAINTS



124 + ALL COMPLAINTS

10 □ COMPLAINT CARS EQUIPPED WITH THE SHIFT INTERLOCK SYSTEM

FIG. 3 COMPLAINTS RECEIVED SINCE JUNE 1987 (RECALL).

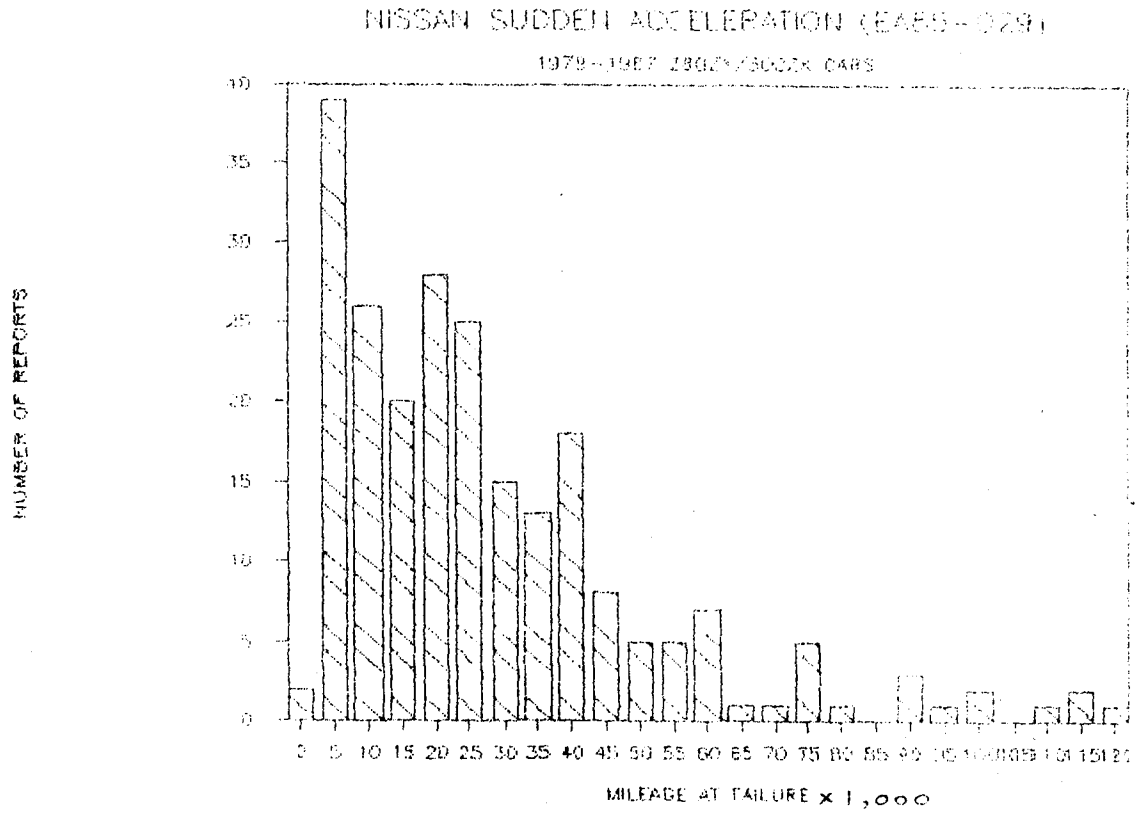
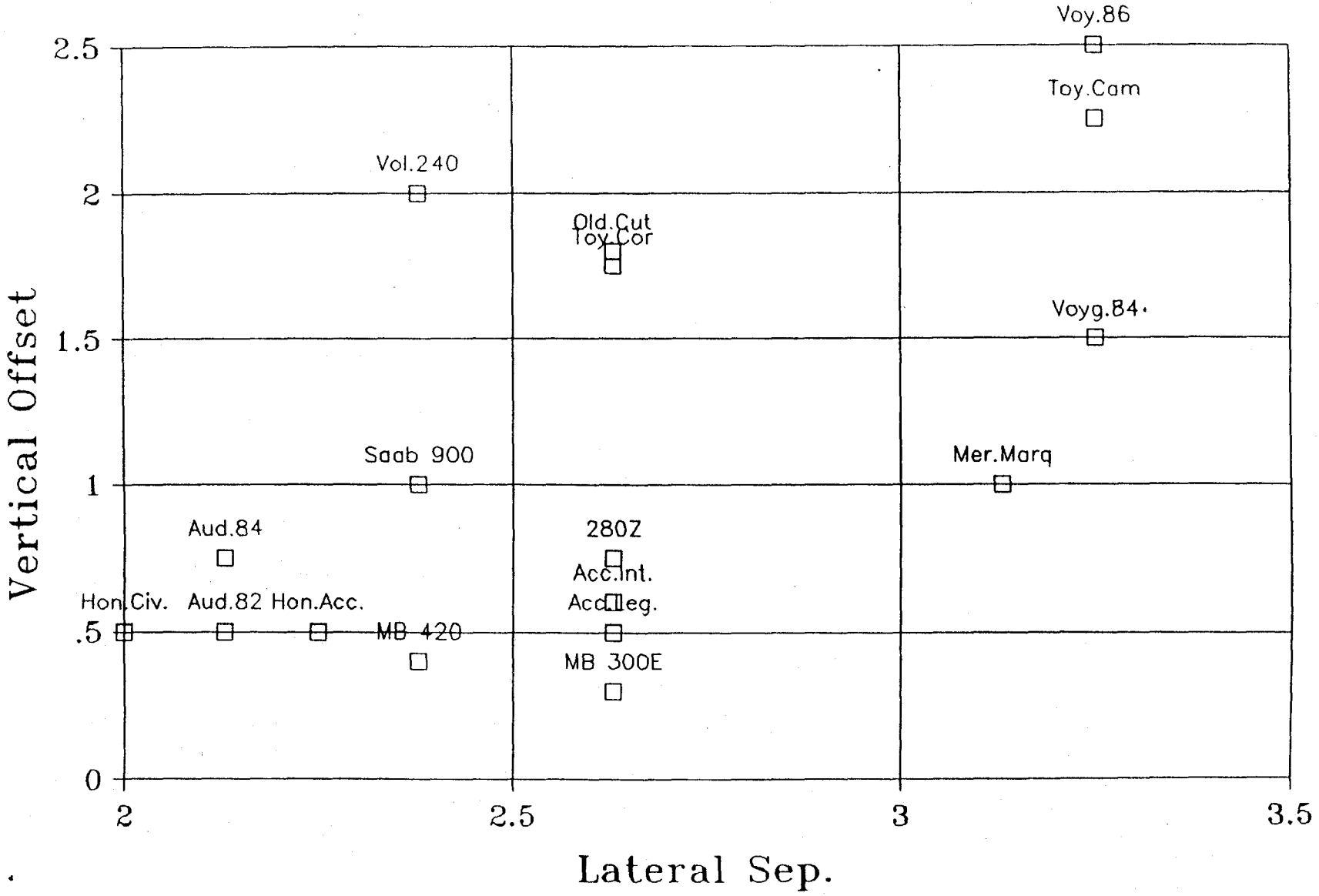


FIG. 4 NUMBER OF COMPLAINT REPORTS VS. MILEAGE

Figure 5: Pedal Separation and Vertical Offset for Selected Vehicles



BRAKE TESTS

(MALE)

VEHICLE	TEST TYPE	SEX	FORCE MAXIMUM LBS.	FORCE MINIMUM LBS.	FORCE AVERAGE LBS.	SPEED AVERAGE MPH	COMMENT
300ZX	Maximum force can apply to pedal	M	344	112	244	--	
300ZX	P→D Stopped	M	80	28	50.17	--	
300ZX TURBO	P→D Stopped	M	256	64	170.8	--	
300ZX	P→D Moving	M	184	68	114.67	19.5	Vehicle fully stopped
300ZX TURBO	P→D Moving	M	384	88	241.60	19.2	Vehicle pushes locked wheels (3.4 mph avg.) heavy brake marks
300ZX	P→R Stopped	M	76	20	49.67	--	
300ZX TURBO	P→R Stopped	M	228	32	117.60	--	
300ZX	P→R Moving	M	136	40	76	10.92	Vehicle fully stopped
300ZX TURBO	P→R Moving	M	336	48	215.8	15.80	Vehicle fully stopped

TABLE 1. NISSAN BRAKE TESTS
(MALE)

BRAKE TESTS

(FEMALE)

VEHICLE	TEST TYPE	SEX	FORCE MAXIMUM LBS.	FORCE MINIMUM LBS.	FORCE AVERAGE LBS.	SPEED AVERAGE MPH	COMMENT
300ZX	Maximum force can apply to pedal	F	136	56	93	--	
300ZX	P→D Stopped	F	24	52	32	--	
300ZX TURBO	P→D Stopped	F	100	56	70.50	--	Vehicle pushed locked wheels no speed heavy brake marks
300ZX	P→D Moving	F	96	40	54.63	19.63	Vehicle fully stopped
300ZX TURBO	P→D Moving	F	180	96	139	19.25	Vehicle pushes locked wheels (5.63 mph avg.) heavy brake marks
300ZX	P→R Stopped	F	46	24	35.75	--	
300ZX TURBO	P→R Stopped	F	104	64	79	--	
300ZX	P→R Moving	F	68	28	56	9.20	Vehicle fully stopped
300ZX TURBO	P→R Moving	F	168	80	101	14.0	Vehicle fully stopped

TABLE 2. NISSAN BRAKE TESTS
(FEMALE)

COMPONENT FUNCTION CHART

COMPONENT	FUNCTION	CONDITIONS TO ENGAGE A.S.C.D.*	CONDITIONS TO DISENGAGE A.S.C.D. **
MAIN SWITCH	Holding type of circuit energizes A.S.C.D. / If ignition off A.S.C.D. relay is deenergized / Main power to A.S.C.D. circuit	ON	OFF
SET SWITCH	Set initial speed -- must be between 30-78 mph.	Speed above 30 mph below 78 mph	Speed below 30 mph above 78 mph
STOP SWITCH	When brake pedal is depressed cuts off power to A.S.C.D. circuit	Service brake off	Service brake on
STOP LIGHT SWITCH	Illuminates brake lights when brake pedal is depressed and operating signal of brake lights is sent to controller to release the system.	Service brake off	Service brake on
SPEED SENSOR	On/Off sensor generates square wave signal. Two pulses per revolution of cable. 300ZX 30-78 mph.	Speed above 30 mph below 78 mph	Speed below 30 mph above 78 mph
INHIBITOR RELAY	Releases A.S.C.D. system when Selector is set to "N" or "P" position.	Selector not in "N" or "P"	Selector in "N" or "P"
ACTUATOR Release Valve (Atmosphere) Air Valve (Atmosphere) Vacuum Valve (Manifold)	Operates throttle by vacuum through valves Normally open) Valves act in servo Normally open) action to modulate Normally closed) speed	Activated and controlled by A.S.C.D. controller (speed > 30 mph)	Closes one valve to vacuum. Opens two valves to atmosphere
A.S.C.D. CONTROLLER	Compares preset speed with actual car speed and maintains preset speed by increasing or decreasing the current flow to the actuator valves.	Main power on and speed selected > 30 mph < 78 mph	Disengages below 30 mph above 78 mph
A.S.C.D. RELAY	Allows power to A.S.C.D. circuits from main switch.	Must be energized by main switch	Deenergized when main switch is "Off"

* All conditions must be met to engage
** Any of the conditions will cause the A.S.C.D. to disengage

TABLE 3. ASCD COMPONENT FUNCTIONS