MERCEDES, JAGUAR, DAIMLER/CHRYSLER "722.6" "5 Speed"

INDEX

Note: An "Update Handbook" with the familiar Green cover, is also available from ATSG and includes much more information on the valve body variations that are found in the 722.6 transmission.

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INTRODUCTION

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MERCEDES, JAGUAR, DAIMLER/CHRYSLER "722.6" "5 Speed"

The Mercedes 722.6 transmission made its first debut here in the United States in 1996. It is used behind 4, 6, 8 and 12 cylinder gasoline engines, as well as their diesel engines. It is their first completely computer controlled transmission and their first to have a transmission with a converter clutch. This electronically controlled 5 speed automatic transmission consists of 3 compound planetary gear sets, 3 multiple disc driving clutches, 3 multiple disc brake clutches and 2 free-wheel clutches, with 5th gear being overdrive. The Electronic Transmission Controller (ETC) controls transmission operation matching engine performance during the shift phase. The driver can choose between 2 driving programs, "S" for standard driving programs and "W" for winter driving programs. Winter option provides a second gear start and a higher gear ratio for a reverse movement. Standard mode provides a first gear take off and a lower reverse gear ratio.

Note: An "Update Handbook" with the familiar Green cover, is also available from ATSG and includes much more information on the valve body variations that are found in the 722.6 transmission.

We wish to send out a hearty "Thank You" to
Rich Varhan at European Transmission Exchange
for supplying the transmission that made this manual possible.

The information and part numbers contained in this booklet have been carefully compiled from industry sources known for their reliability, but ATSG does not guarantee its accuracy.

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TRANSMISSION IDENTIFICATION

To utilize the 722.6 transmission behind the diesel, and the 4, 6, 8 and 12 cylinder gas engines, different gear ratios and torque capacities are needed. Various ratios are accomplished in 2 ways:

1. ***Different size axle ratios in the rear differential.***
2. ***Different ratio planetary gear sets inside the transmission.***

Various amounts of friction and steel plates are used to accommodate the required torque capacity through different heights in the apply piston or snap ring groove location.

Should an incorrect transmission or rear axle ratio be installed into the vehicle, the computer system will observe this as a slipping transmission and produce gear ratio error codes.

Should incorrect clutch drums or pistons be used, such as a 4 cylinder set up behind a 12 cylinder engine, premature failure of the transmission will be the result.

It is for these reasons that proper identification be employed when rebuilding or exchanging this unit. To order parts from Mercedes, you ***must*** provide the VIN number.

Use Figure 1 to locate and identify the transmission designation number that is etched into a raised boss area on the left side of the transmission case. This number is matched to the engine size which determines the gear ratio and clutch capacity of the transmission. There are currently four different planetary gear ratios used in the 722.6 unit.

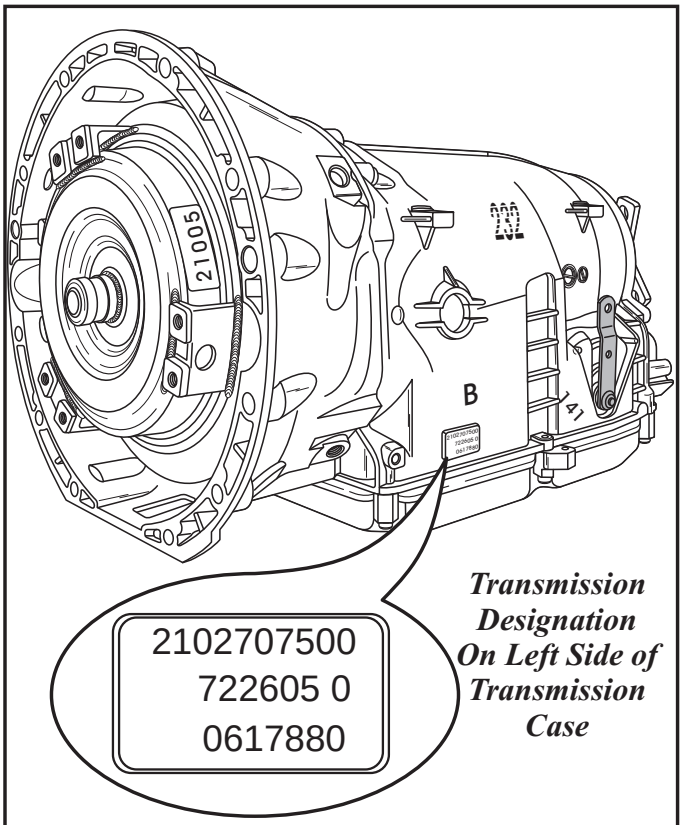
NAG1 identifies a family of transmissions and means "N"ew "A"utomatic "G"earbox, generation 1. Various marketing names are associated with the NAG1 family of transmissions, depending on the transmission variation being used in a specific vehicle. Some examples of the marketing names are W5A300 and W5A580. Refer to Figure 1.

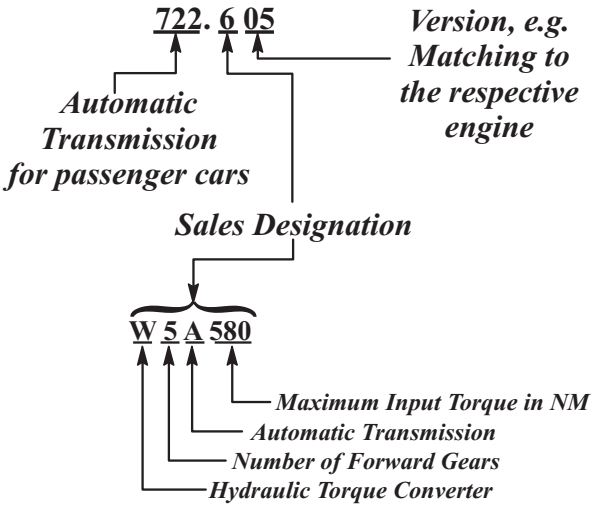
Transmission and Engine designations can be identified and cross referenced to the year, model and in some cases the VIN number, for Mercedes vehicles from 1996-2001, equipped with the 722.6 transmission.

For Mercedes model years 1996-2001, refer to Figure 2 and Figure 3.

For Mercedes model years 2002-2004, refer to Figure 4.

For Daimler/Chrysler models that are equipped with the 722.6 transmission, refer to Figure 5.

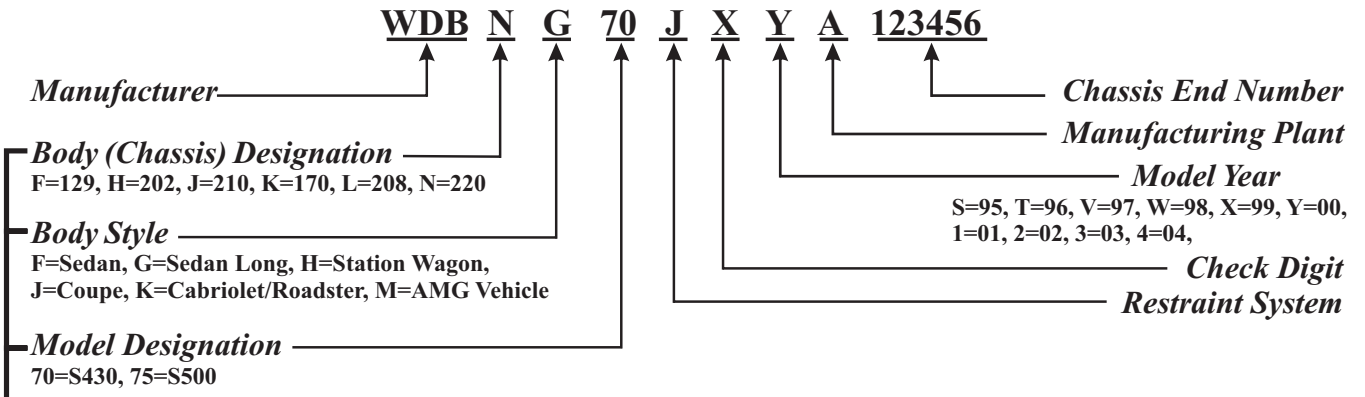




W5A 580 = Passenger Cars with 8 and 12 cylinder engines
W5A 400 = AAV (SUV) vehicles with 8 cylinder engines
W5A 330 = Passenger cars with 4, 5 and 6 cylinder engines
W5A 300 = AAV (SUV) vehicles with 6 cylinder engines
W5A 280 = MB Vans - Vito, Sprinter and Vario

Figure 1

Vehicle Identification Number (VIN) Designation

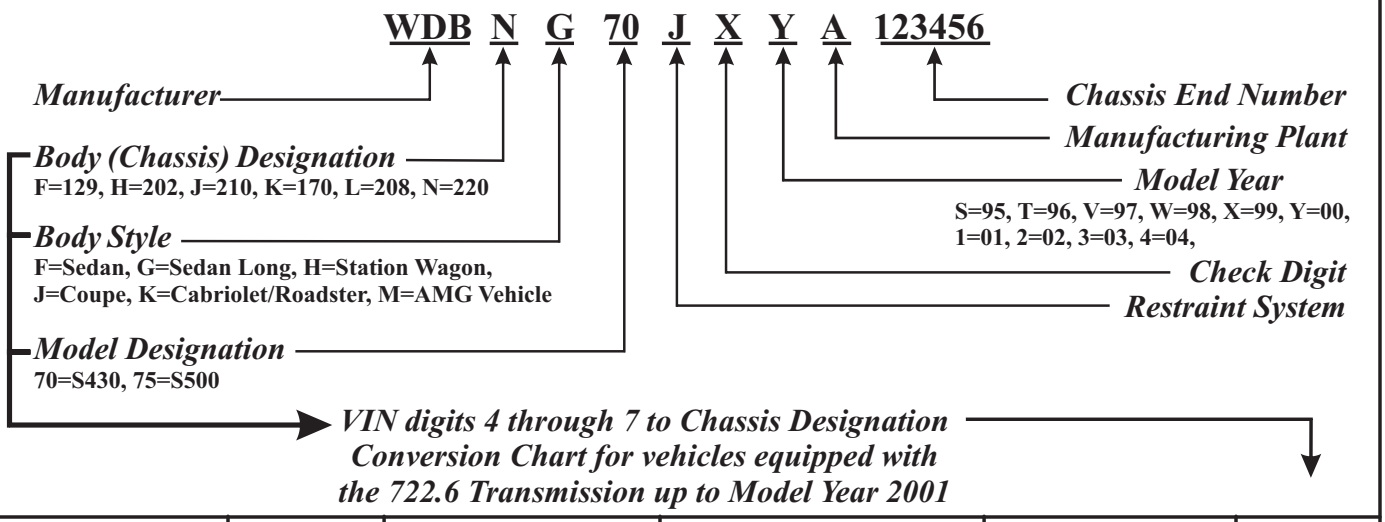


VIN digits 4 through 7 to Chassis Designation Conversion Chart for vehicles equipped with the 722.6 Transmission up to Model Year 2001

Model	Year	Chassis	Engine	Transmission	VIN
C230	1997-1998	202.023	111.974 ME 2.1	722.600	HA23
C230	1999-2000	202.024	111.975 ME 2.1	722.600/5	HA24
C240	2001	203.061	112.912 ME 2.8	722.6	RF61
C280	1996-1997	202.028	104.941 HFM	722.604/5/629	HA28
C280	1998-1999	202.029	112.920 ME 2.0	722.606	HA29
C320	2001	203.064	112.946 ME 2.8	722.6	RF64
C36 AMG	1996-1997	202.028	104.941 HFM	722.604/5/629	HM36
C43 AMG	1998-1999	202.043	113.944 ME 2.0	722.631	
CL500 Coupe	1996-1999	140.070	119.980 ME 1.0	722.620	GA70
CL500 Coupe	2000	215.375	119.960 ME 2.0	722.6	PJ75
CL500 Coupe	2001	215.375	119.960 ME 2.8	722.633	PJ75
CL600 S600	1996-1998	140.076	102.982 ME 1.0	722.621	GA76
CLK320 Coupe	1998-2001	208.365	112.940 ME 2.0	722.607	LJ65
CLK320 Cabriole	1998-2001	208.465	112.940 ME 2.0	722.607	LK65
CLK430 Coupe	1999-2001	208.370/470	113.944/943 ME 2.0	722.607	LJ70/LK70
CLK55	2001	208.374	113.984 ME 2.8	722.6	LJ74
E300 Turbo Diesel	1998-1999	210.025	606.962 IFI	722.608	JF25
E300 Diesel	1996-1997	210.020	606.912 IFI	722.600/8	JF20
E320	1996-1997	210.055	104.995 HFM	722.605/629	JF55
E320 Sedan	1998-1999	210.065	112.995/41 ME 2.0	722.607	JF65
E320 Sedan 4 Matic	1998-1999	210.082	112.995/41 ME 2.0	722.664	JF82
E320 Wagon	1998-1999	210.265	112.995/41 ME 2.0	722.607	JH65
E320 Wagon 4 Matic	1998-1999	210.282	112.995/41 ME 2.0	722.664	JH82
E320 Sedan	2000	210.065	112.941 ME 2.8	722.607	JF65
E320 Sedan 4 Matic	2001	210.082	112.941 ME 2.8	722.664	JF82
E320 Wagon	2001	210.265	112.941 ME 2.8	722.607	JH65
E320 Wagon 4 Matic	2001	210.282	112.941 ME 2.8	722.664	JH82
E420	1996-1997	210.072	119.985 ME 1.0	722.625	JH72
E430	1998-1999	210.070	113.940 ME 2.0	722.623	JH70
E430 Sedan	2001	210.070	113.940 ME 2.8	722.623	JH65
E430 Sedan 4 Matic	2001	210.083	113.940 ME 2.8	722.623	JH82

Figure 2

Vehicle Identification Number (VIN) Designation



VIN digits 4 through 7 to Chassis Designation Conversion Chart for vehicles equipped with the 722.6 Transmission up to Model Year 2001

Model	Year	Chassis	Engine	Transmission	VIN
E55 AMG	1999	210.074	113.980 ME 2.0	722.623/24/636	
E55 AMG	2001	210.074	113.980 ME 2.0	722.6	JF74
ML320	1998-1999	163.154	112.942	722.662	
ML430	1999	163.172	113.942 ME 2.0	722.663	
ML55	2000	163	113 M 2.0	722.6	
S320	1997-1999	140.032	104.994 ME 2.1	722.605	GA32
S320	1997-1999	140.032 Long	104.994 ME 2.1	722.605	GA33
S420	1996-1999	140.032/43	104.9(7)81 ME 1.0	722.622/633	GA32
S430	1998-1999	140.0	113. ME 2.0	722.6	
S430	2000	220.170	113.941 ME 2.0	722.6	NG70
S430	2001	220.170	113.941 ME 2.8	722.632	NG70
S500 Coupe	1996-1998	140.070	119.970 ME 1.0	722.620	GA70
S500	1996-1999	140.051	119.9(7)80 ME 1.0	722.620/622	GA51
S500	2000	220.175	113.960 ME 2.0	722.6	NG75
S500	2001	220.175	113.960 ME 2.8	722.6	NG75
S600	1996-1999	140.057	120.982 ME 1.0	722.621	GA57
S600 Coupe	1996-1997	140.076	120.980/2 ME 1.0	722.621	
S600	2000	220.178	120.982 ME 1.0	722.621	NG78
S600	2001	220.178	137.970	722.628	NG78
SL320	1996-1997	126.063	104.991 HFM	722.603/5	FA63
SL500	1996-1998	129.067	119.9(7)82 ME 1.0	722.620	FA67
SL500	1999-2001	129.068	113.961 ME 2.0	722.620/624	FA68
SL600	1996-2001	129.076	120.983(1) ME 1.0	722.621/32	JH82
SLK230	1998-1999	170.447	111.973 ME 2.1	722.605	KK47
SLK230	2000	170.449	111.983 ME 2.1	722.616	KK49
SLK230	2001	170.449	111.983 ME 2.8	722.616	KK49
SLK320	2000	170.465	112.973 ME 2.0	722.618	KK65
SLK320	2001	170.465	112.973 ME 2.8	722.618	KK65
SLK430	1999	170.4	113. ME 2.0	722.6	KK65

Figure 3

MERCEDES 722.6 USAGE 2002-2004

SEDANS

C240 Sedan - 2.6L, 18 Valve, V-6 Engine.
C320 Sedan - 3.2L, 18 Valve, V-6 Engine.
C32 AMG Sedan - Supercharged SOHC 3.2L, 18 Valve, V-6 Engine.
E320 Sedan - 3.2L, 18 Valve, V-6 Engine.
E430 Sedan - 4.3L, 24 Valve, V-8 Engine.
E500 Sedan - 5.0L, 24 Valve, V-8 Engine.
E55 AMG Sedan - 5.5L, 24 Valve, V-8 Engine.
S430 Sedan - 4.3L, 24 Valve, V-8 Engine.
S500 Sedan - 5.0L, 24 Valve, V-8 Engine.
S600 Sedan - 5.5L, 24 Valve, V-12 Engine.
S600 Sedan - 5.8L, 36 Valve, V-12 Engine.
S55 AMG Sedan - 5.5L, 24 Valve, V-8 Engine.

COUPES

C230 Kompressor Sport Coupe - 1.8L, Intercooled, Supercharged DOHC, 16 Valve, L-4 Engine.
C230 Kompressor Sport Coupe - 2.3L, DOHC, 16 Valve, L-4 Engine.
CLK320 Coupe - 3.2L, 18 Valve, V-6 Engine.
CLK320 Cabriolet - 3.2L, 18 Valve, V-6 Engine.
CLK430 Coupe - 4.3L, 24 Valve, V-8 Engine.
CLK430 Cabriolet - 4.3L, 24 Valve, V-8 Engine.
CLK55 AMG Coupe - 5.5L, 24 Valve, V-8 Engine.
CLK55 AMG Cabriolet - 5.5L, 24 Valve, V-8 Engine.
CL500 Coupe - 5.0L, 24 Valve, V-8 Engine.
CL55 AMG Coupe - 5.5L, 24 Valve, V-8 Engine.
CL600 Coupe - 5.5L, 36 Valve, V-12 Engine.
CL600 Coupe - 5.8L, 36 Valve, V-12 Engine.

ROADSTERS

SLK230 Roadster - 2.3L, Intercooled, Supercharged DOHC, 16 Valve, L-4 Engine.
SLK320 Roadster - 3.2L, 18 Valve, V-6 Engine.
SLK32 AMG - 3.2L, Intercooled, Supercharged SOHC, 18 Valve, V-6 Engine.
SL500 Roadster - 5.0L, 24 Valve, V-8 Engine.
SL55 AMG - 3.2L, Intercoled, Supercharged SOHC, 18 Valve, V-6 Engine.
SL600 Roadster - 6.0L, 48 Valve, V-12 Engine.
SL500 Silver Arrow Edition - 5.0L, 24 Valve, V-8 Engine.
SL600 Silver Arrow Edition - 6.0L, 48 Valve, V-12 Engine.

WAGONS

C240 Wagon - 2.6L, 18 Valve, V-6 Engine.
C320 Wagon - 3.2L, 18 Valve, V-6 Engine.
E320 Wagon - 3.2L, 18 Valve, V-6 Engine.

LIGHT TRUCKS

ML320 Light Trucks - 3.2L, 18 Valve, V-6 Engine.
ML350 Light Trucks - 3.7L, 18 Valve, V-6 Engine.
ML500 Light Trucks - 5.0L, 24 Valve, V-8 Engine.

Figure 4

DAIMLER-CHRYSLER 2003-2005 USAGE

2003 MODEL YEAR			
Sprinter (VA)	*2.7L (5 cylinder) Diesel (EX9)*	*Trans Code: DGJ*	*W5A380*
2004 MODEL YEAR			
Sprinter (VA)	*2.7L (5 cylinder) Diesel (EX9)*	*Trans Code: DGJ*	*W5A380*
Crossfire (ZH)	*3.2L (6 cylinder) Gas (EGX)*	*Trans Code: DGU*	*W5A330*
2005 MODEL YEAR			
Sprinter (VA)	*2.7L (5 cylinder) Diesel (EX9)*	*Trans Code: DGJ*	*W5A380*
Chrysler 300C (LX)	*5.7L (8 cylinder) Gas (EZB)*	*Trans Code: DGJ*	*W5A580*
Dodge Magnum (LX)	*5.7L (8 cylinder) Gas (EZB)*	*Trans Code: DGJ*	*W5A580*
Grand Cherokee (WK)	*3.7L (6 cylinder) Gas (EKG)*	*Trans Code: DGJ*	*W5A580*
Grand Cherokee (WH)	*3.0L (6 cylinder) Diesel (EXL)*	*Trans Code: DGJ*	*W5J400*
Crossfire (ZH)	*3.2L (6 cylinder) Gas (EGX)*	*Trans Code: DGU*	*W5A330*

Figure 5

GENERAL DESCRIPTION

The Mercedes 722.6 transmission made its first debut in the United States in 1996. It is used behind 4, 6, 8 and 12 cylinder gasoline engines, as well as their diesel engines. It is their first completely computer controlled transmission and their first transmission equipped with a converter clutch. This fully electronic controlled five speed automatic transmission consists of 3 compound planetary gear sets, 3 multiple disc driving clutches, 3 multiple disc brake clutches and 2 free-wheel (sprag) clutches, with 5th gear being overdrive. The three planetary gear sets provide the five forward gear ratios and two ratios for reverse.

Changing gear ratios is fully automatic and is accomplished on the Mercedes units with the use of an Electronic Transmission Controller (ETC). On the Daimler/Chrysler units, it is referred to as a Transmission Control Module (TCM). Both of the controllers are the same and in this manual will be referred to as a Transmission Control Module (TCM), regardless of the application.

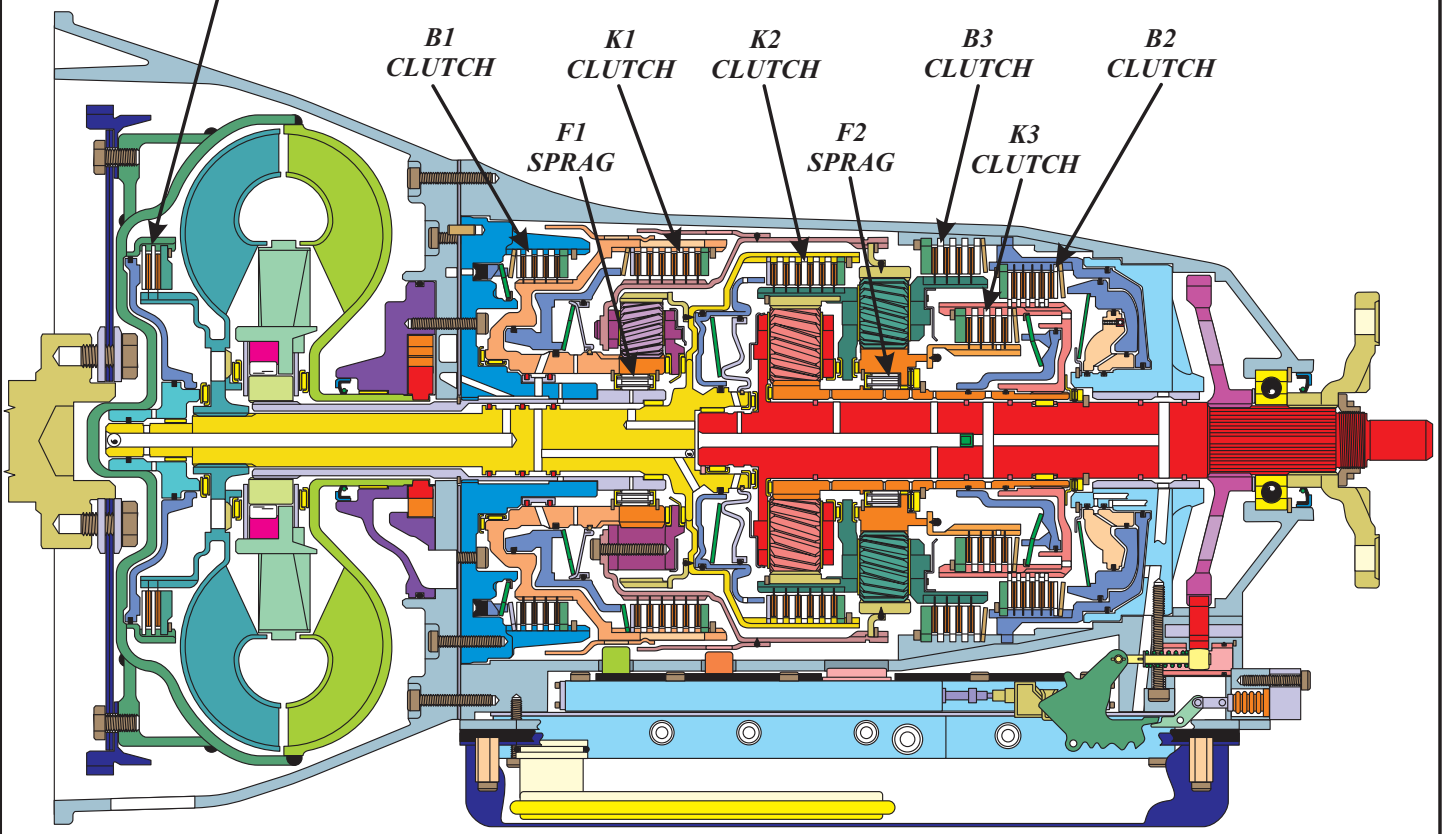
The TCM receives and monitors various electronic sensor inputs, and uses this information to shift the transmission at the optimum time and also controls line pressure.

The TCM commands shift solenoids and variable bleed Pulse Width Modulated (PWM) solenoids within the transmission to control shift timing. The TCM controls shift feel through the PWM solenoids. The TCM also controls the apply and release of the torque converter clutch which allows the engine to deliver the maximum fuel efficiency without sacrificing vehicle performance.

On Mercedes vehicles the driver can also choose between 2 driving programs, "S" for standard driving programs and "W" for winter driving programs. Winter option provides a second gear start and a higher gear ratio for a reverse movement. Standard mode provides a first gear take off and a lower reverse gear ratio.

The friction components used in this transmission consist of six multiple disc clutches. The multiple disc clutches combine with two mechanical sprag clutches, to deliver five forward gear ratios, and two reverse gear ratios, through the gearsets to the output shaft. Refer to Figure 6 for the internal component location and application chart for the 722.6 transmission.

INTERNAL COMPONENT IDENTIFICATION AND LOCATION



COMPONENT APPLICATION CHART

RANGE	B-1 Clutch	K-1 Clutch	K-2 Clutch	K-3 Clutch	B-3 Clutch	B-2 Clutch	F-1 Sprag	F-2 Sprag	Torq Conv Clutch	GEAR RATIO
Park	On			On						
Reverse [1]	On				On		Hold			3.16
Reverse [2]		On		On	On					1.93
Neutral	On			On						
"D"-1st	On [3]			On [3]		On	Hold	Hold		3.59
"D"-2nd		On		On [3]		On		Hold	Applied*	2.19
"D"-3rd		On	On			On			Applied*	1.41
"D"-4th		On	On	On					Applied*	1.00
"D"-5th	On		On	On			Hold [3]		Applied*	0.83

1 Mode Selector Switch in the "S" position.
2 Mode Selector Switch in the "W" position.
3 Shift components required for engine braking during coast conditions.
** TCC is available in 2nd thru 5th gear, based on throttle position, fluid temp and vehicle speed.*

Figure 6

722.6 TRANSMISSION SOLENOID APPLICATION CHART

From the solenoid shift chart below, you will notice that shift solenoids 1-2/4-5, 2-3 and 3-4 are toggled ***"on-to-off"*** to make there respective shifts. While in gear they remain in the ***"off"*** state. This explains why, while you are driving, whatever the gear the transmission was in at the time the computer system observed a fault, that would be the gear the transmission failsafes to. When the vehicle is brought to a stop and the ignition is cycled, the transmission will remain in second gear. ***Special Note:*** If codes are stored and repairs have been made, all codes must be cleared for the limp mode feature to be turned off.

GEAR SHIFTS	SOLENOID					
	1-2/4-5 ⅄	2-3	3-4 ✸	MOD PC ⌑	SHIFT PC ◎	TCC ⌾
1ST	OFF	OFF	OFF	PWM	OFF	OFF
SHIFT	ON	OFF	OFF	PWM	PWM	OFF
2ND	OFF	OFF	OFF	PWM	OFF	*PWM
SHIFT	OFF	ON	OFF	PWM	PWM	*PWM
3RD	OFF	OFF	OFF	PWM	OFF	*PWM
SHIFT	OFF	OFF	ON	PWM	PWM	*PWM
4TH	OFF	OFF	OFF	PWM	OFF	*PWM
SHIFT	ON	OFF	OFF	PWM	PWM	*PWM
5TH	OFF	OFF	OFF	PWM	OFF	*PWM

Additional solenoid activity observed:

⅄ ***1-2/4-5 Solenoid is pulsed during ignition crank.***

✸ ***3-4 Shift solenoid is pulsed continuously while in Park and during selector lever movement (Garage Shifts).***

⌑ ***a) Pulsed constantly while idling in Park or Neutral at approximately 40% Duty cycle.***
b) Voltage observed varied with throttle opening as well as during selector lever movement.

◎ ***a) Pulsed constantly while idling in Park or Neutral at approximately 33% Duty cycle.***
b) Voltage observed varied with throttle opening during each gear shift only.

⌾ **** The TCC solenoid is also Pulse Width Modulated and duty cycles to apply the clutch.***
**** The TCC is available in 2nd, 3rd, 4th and 5th gears, based on vehicle speed, throttle position and ATF temp.***

SHIFT GROUPS

By viewing the mechanical, hydraulic and electrical operation of a shift, it can be observed that a specific solenoid and a group of valves cause a clutch application change. This is described as a "Shift Group." A shift group has two phases. The transition from one gear to the next is called a "shift phase." Once the shift is complete and the transmission is in gear it is called the "stationary phase." There are a total of three shift groups with which 5 forward speeds are achieved. In a shift phase, a shift solenoid initiates the application of one group of valves to change the clutches required for that shift. During this time the other two groups remain in the stationary phase.

Figure 7

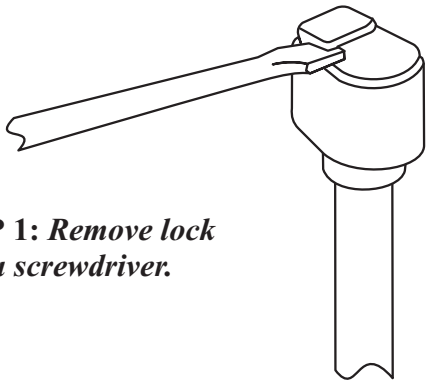
FLUID CHECKING PROCEDURE AND RECOMMENDED FLUID

Recommended Fluid...Mercedes Synthetic ATF...Part Number 001 989 21 03 10 or suitable substitute.
Daimler/Chrysler Sprinter & Crossfire....Part Number 5127382AA.
Dodge Magnum, 300C & Grand Cherokee.... Chrysler Type 4 fluid.

The Mercedes transmission does NOT come equipped with a dip stick for checking fluid level. The filler tube has a locking plug in it from the factory. When fluid level needs to be checked use a screw driver to pry the lock from the plug and remove the plug as seen below. Ensure vehicle is parked on level ground and apply the parking brake.

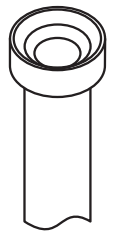
Purchase the dip stick from a Mercedes Benz dealer using part number 140 589 15 21 00 shown below. While in Park at idle, with fluid warm, use the **tool** to check fluid level by inserting the dip stick into the filler tube until fully seated, wait 3 seconds, then remove the dip stick and check the fluid level indication on the dip stick, as shown below.

Dipstick tool for Sprinter & Crossfire use Miller Tool 8863A, Magnum & 300C use Miller Tool 9336. Grand Cherokee comes equipped with a dipstick. Sprinter/Crossfire uses Trans fluid 5127382AA and can be topped off with no more than 1 quart of Type 4. The Dodge Magnum, 300C and the Grand Cherokee use Chrysler Type 4 fluid.



STEP 1: ***Remove lock with a screwdriver.***

STEP 2: ***Remove Plug. Part # 05093746AA for a new lock pin.***



STEP 3: ***Use "Special Tool" to check fluid level, as shown below. Mercedes Part Number, 140 589 15 21 00. Sprinter & Crossfire, Chrysler Number, Miller Tool 8863B. Magnum & 300C, Chrysler Number, Miller Tool 9336. Grand Cherokee comes equipped with a dipstick..***

Approximate measurements taken from the bottom of the stick to the individual fill lines.

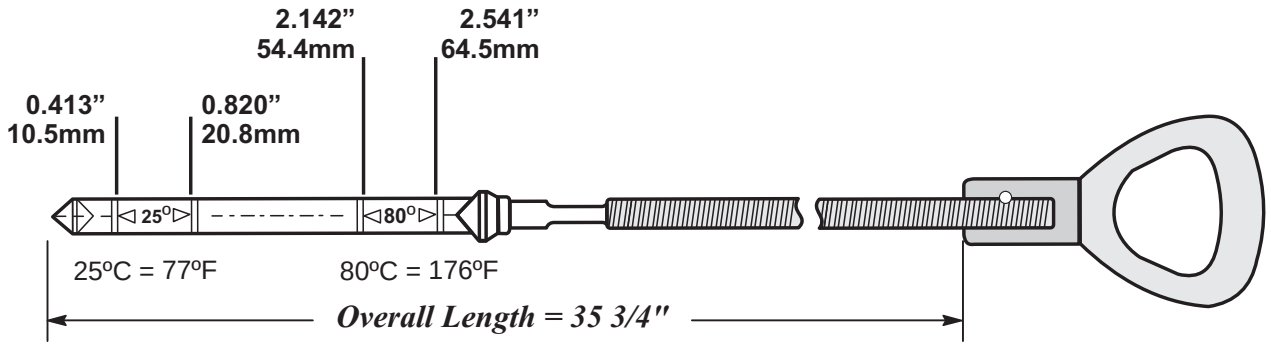


Figure 8

OIL LEVEL CONTROL

The oil level is controlled with a "float", that is an integral part of the valve body assembly, as shown in Figure 9. The "float" is positioned so that it can plug the opening between the transmission sump and the gearset chamber so that the rotating gearsets do not create foaming, aerate the fluid, or force it out the breather. With normal oil levels, the lubricating oil which flows constantly out of the gearset, flows back to the sump through the bottom case opening. When the oil level rises (as fluid is heated), the oil presses the "float" against the opening. The "float" therefore seperates the transmission sump from the gearset chamber. The lubricating oil which continues to flow out of the gearsets is thrown against the case wall and returns to the sump through the upper opening, as shown in Figure 9.

EFFECTS OF INCORRECT FLUID LEVEL

A low fluid level allows the oil pump to take in air along with the fluid. Air in the fluid will cause oil pressures to be low and pressures will develop slower than normal.

If the transmission is overfilled, the gearsets will churn the fluid into foam. This aerates the fluid and can cause the same conditions that occur with low fluid levels. Foaming also causes fluid expansion which can result in fluid overflow from the vent or fill tube. Fluid overflow can easily be mistaken for a leak if inspection is not done carefully.

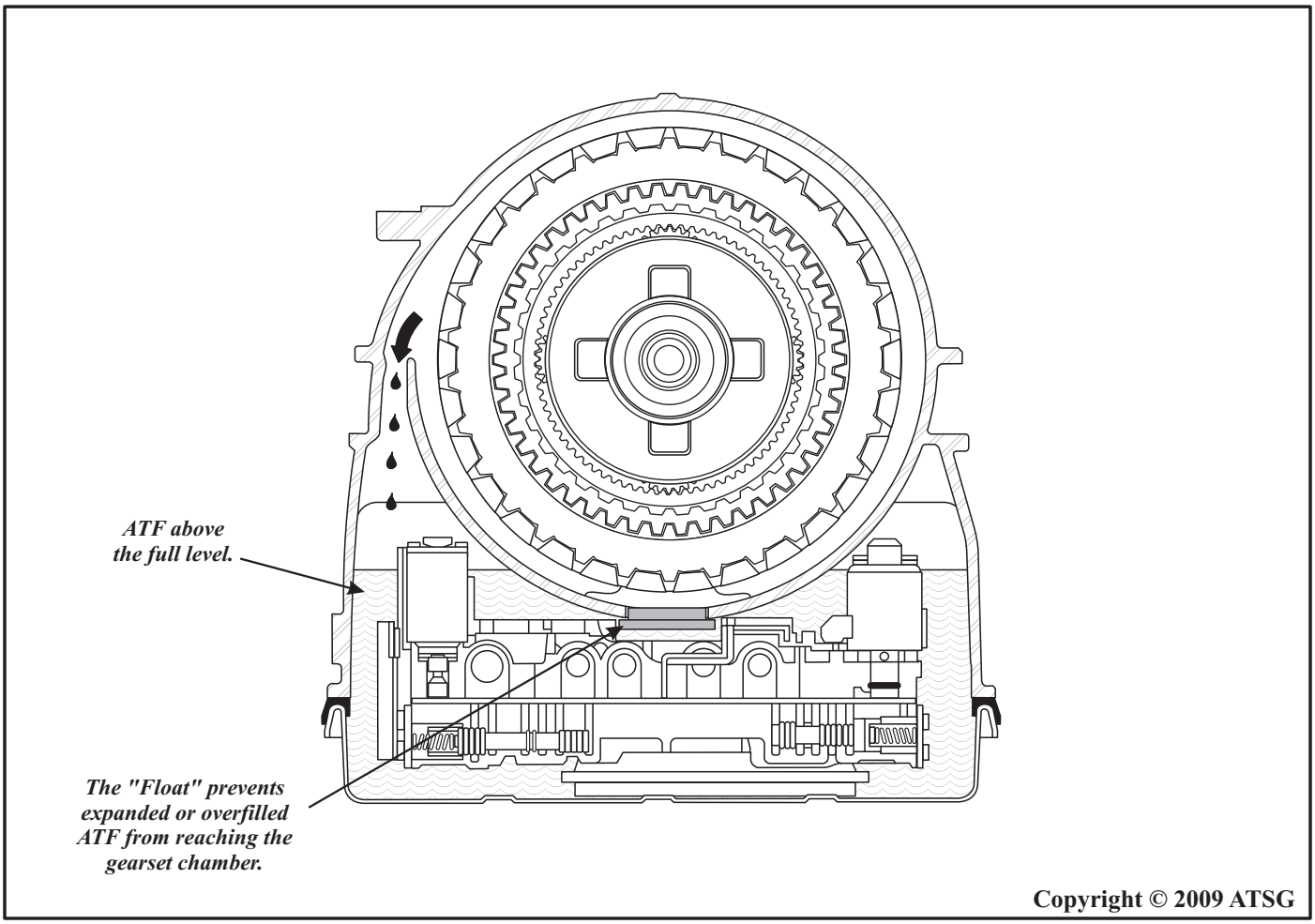


Figure 9

ELECTRONIC COMPONENTS

Solenoid Locations And Identification

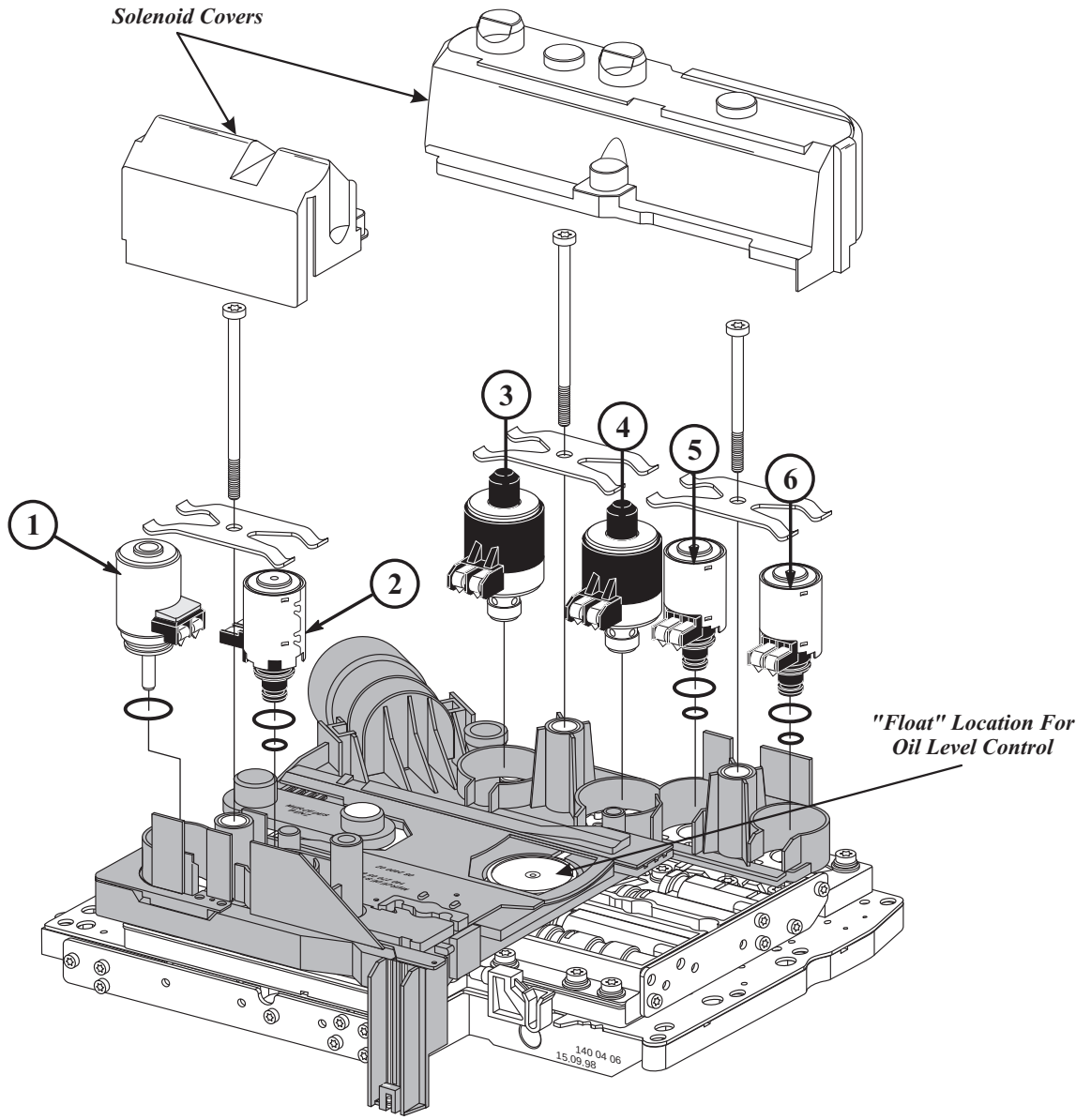
All models of the 722.6 transmission use a total of six solenoids mounted on the electronic conductor plate and the valve body, as shown in Figure 10. The solenoids are located under 2 white plastic covers, also show in Figure 10. Earlier valve bodies do not have these covers. They were added to help protect the electrical connections from shorts created by metal particles that may be floating in the fluid.

These covers are not available seperately for retro-fitting. When a new conductor plate is purchased, covers should accompany the conductor plate.

The location of the "Float", that is used for oil level control is also shown in Figure 10.

Continued on Page 13

SOLENOID LOCATIONS AND IDENTIFICATION



1 Torque Converter Clutch Solenoid.
2 2-3 Shift Solenoid.
3 Modulated Pressure Control Solenoid.
4 Shift Pressure Control Solenoid.
5 1-2/4-5 Shift Solenoid.
6 3-4 Shift Solenoid.

Figure 10

ELECTRONIC COMPONENTS (CONT'D)

Modulated Pressure Control (MPC) Solenoid Operation

The Modulated Pressure Control (MPC) Solenoid is the line pressure control solenoid which controls main line pressure rise. This solenoid is located in the electrical conductor plate, uses no "O" ring seals and relys strictly on the machined surfaces of the solenoid and the upper valve body to seal the oil pressure. This solenoid is a Pulse Width Modulated solenoid which is supplied a variable current flow from the TCM. When the solenoid is at minimum exhaust, line pressure is high. When the solenoid is at maximum exhaust, line pressure is low. The MPC Solenoid is constantly pulse-width modulating and fluctuates with throttle movement. Refer to Figure 11.

The MPC and SPC solenoids are interchangeable and work in tandem together to control holding clutch pressure as well as to assist the shift solenoids to control shift feel.

Shift Pressure Control (SPC) Solenoid Operation

The Shift Pressure Control (SPC) Solenoid regulates oil pressure to all clutch packs to control the pressure cutback during a shift, as well as the clamping force needed to prevent a clutch from slipping. This solenoid is located in the electrical conductor plate, uses no "O" ring seals and relys strictly on the machined surfaces of the solenoid and the upper valve body to seal the oil pressure. This solenoid is a Pulse Width Modulated solenoid which is supplied a variable current flow from the TCM. When the solenoid is at minimum exhaust, clutch pressure is high. When the solenoid is at maximum exhaust, clutch pressure is low. Refer to Figure 12.

The SPC and MPC solenoids are interchangeable and work in tandem together to control holding clutch pressure as well as to assist the shift solenoids to control shift feel.

Torque Converter Clutch (TCC) Solenoid Operation

The Torque Converter Clutch (TCC) Solenoid is a Pulse Width Modulated solenoid that regulates pressure to the torque converter clutch through the TCC control valve in the valve body. The TCC Solenoid is located in the electrical conductor plate, uses one "O" ring seal and also relys on machined surfaces of the bottom stem of solenoid and the valve body to seal the oil pressure. Converter clutch apply pressure is controlled in order to "ramp" the converter clutch on and off making for a smooth converter clutch apply and release. When the solenoid is at maximum exhaust, the converter clutch is released.. When solenoid is at minimum exhaust, the converter clutch is fully applied. Refer to Figure 13.

Shift Solenoid Operation

The 1-2/4-5, 2-3, and 3-4 Shift Solenoids are all "On/Off", normally closed solenoids. The shift solenoids are located in the electrical conductor plate, uses 2 "O" ring seals to seal the oil pressure. When the solenoid is "ON", it opens and transmits shift valve command pressure to the corresponding shift valve. When the solenoid is "OFF", shift valve command oil pressure is blocked. Refer to Figure 14.

The 1-2/4-5, 2-3, and 3-4 Shift Solenoids are toggled "On" to make the shift and when the shift is complete, they are toggled "Off" and remain in the "Off" state.

The three shift solenoids are also interchangeable.

Electronic Components Continued on Page 16

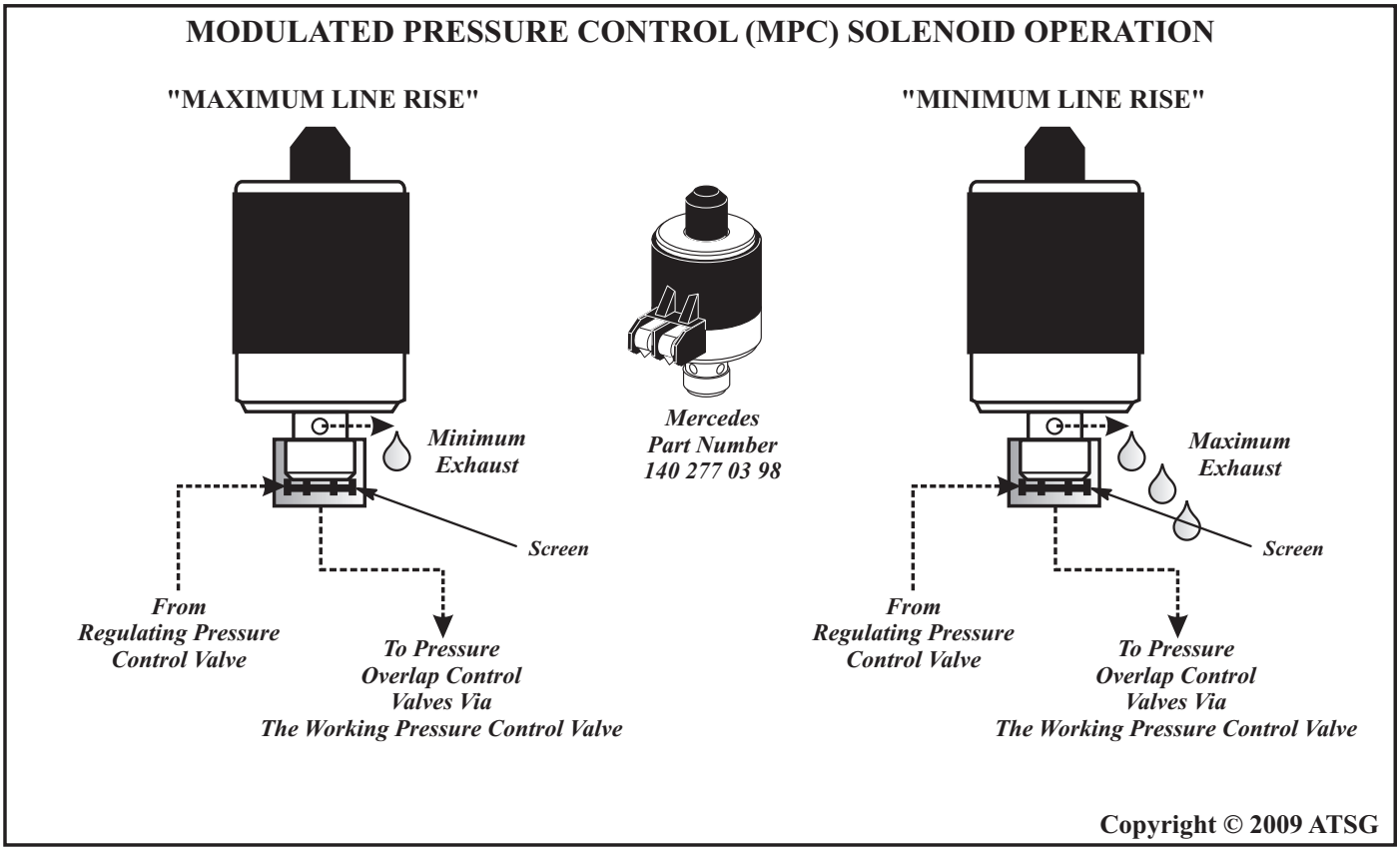


Figure 11

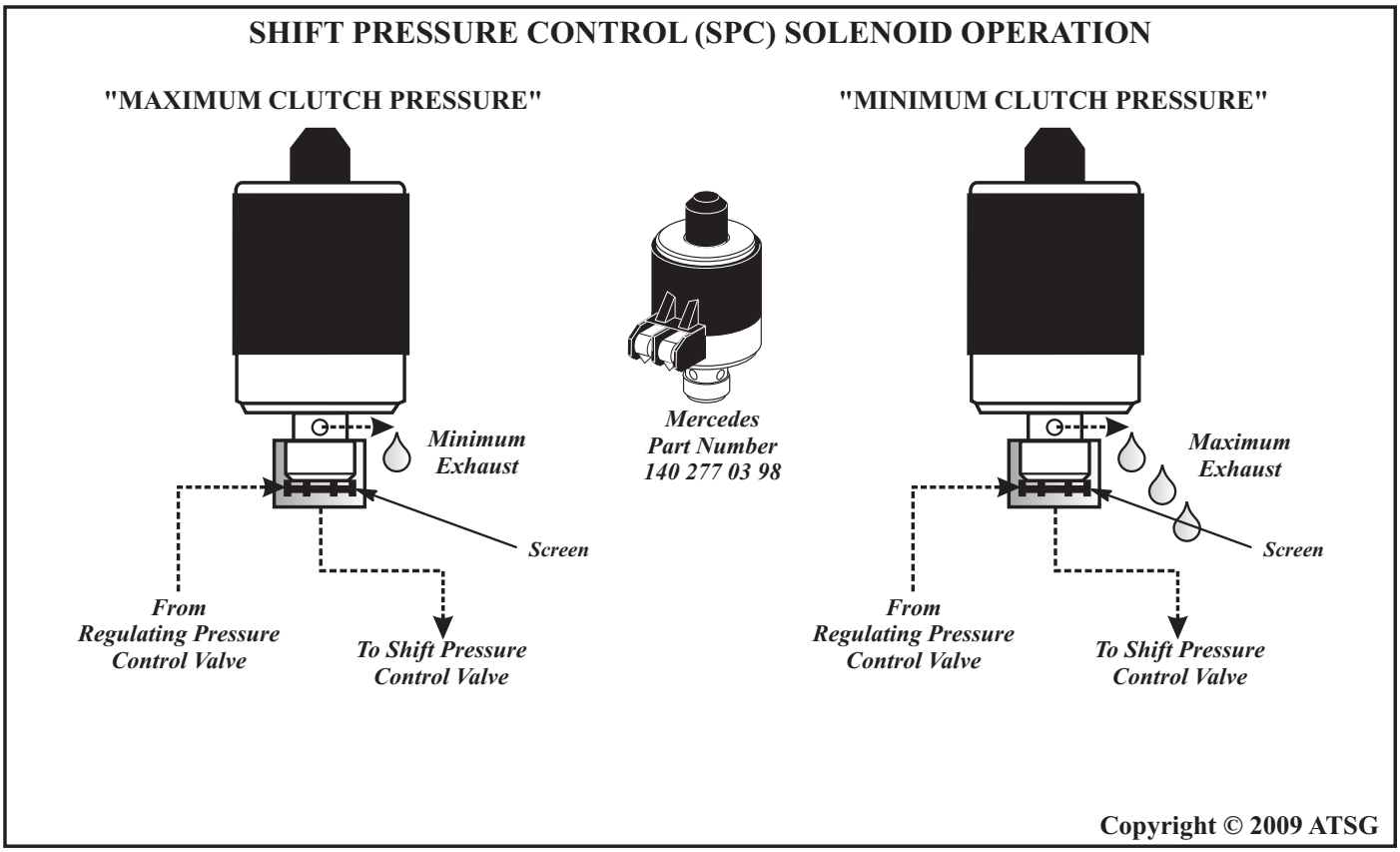


Figure 12

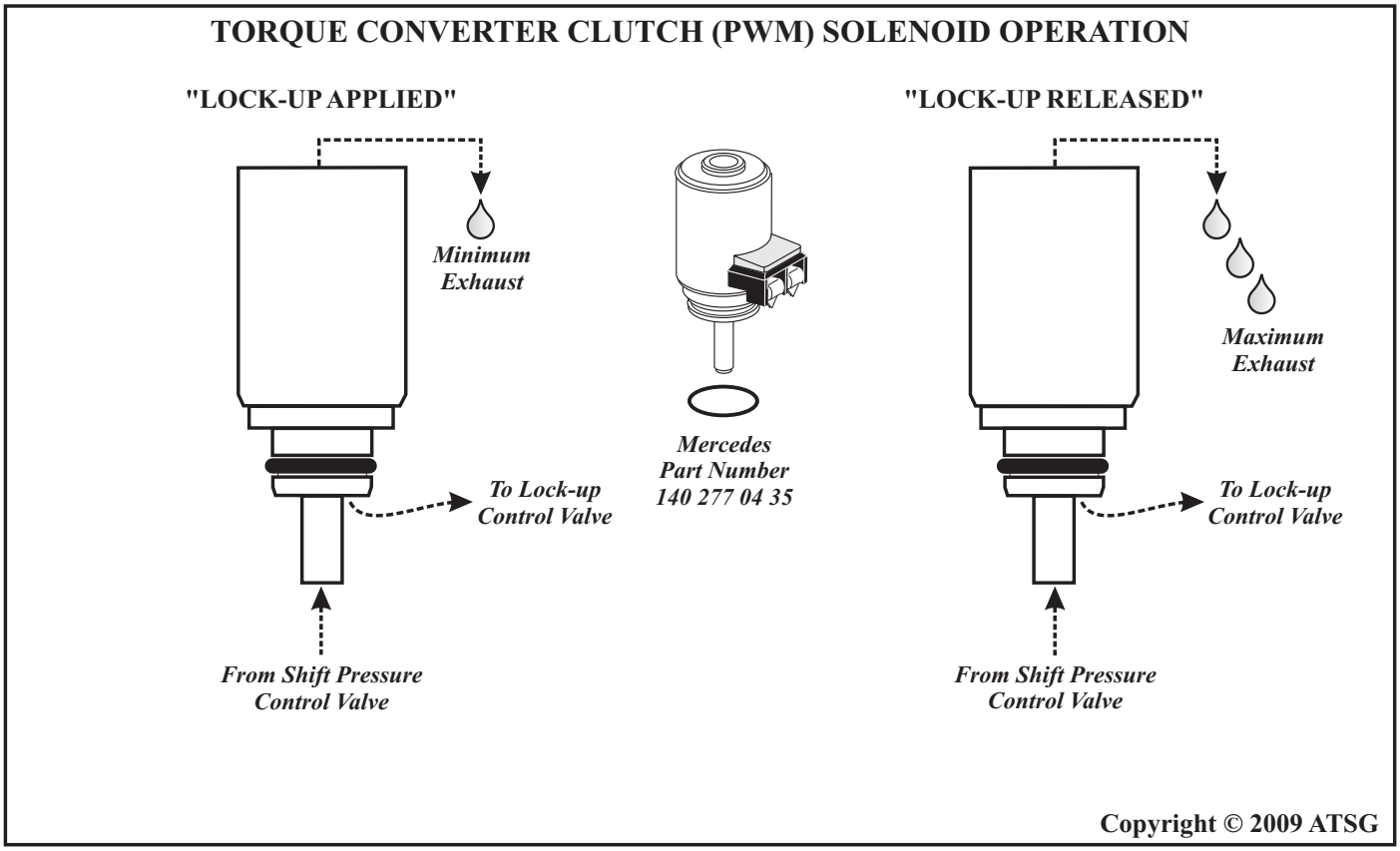


Figure 13

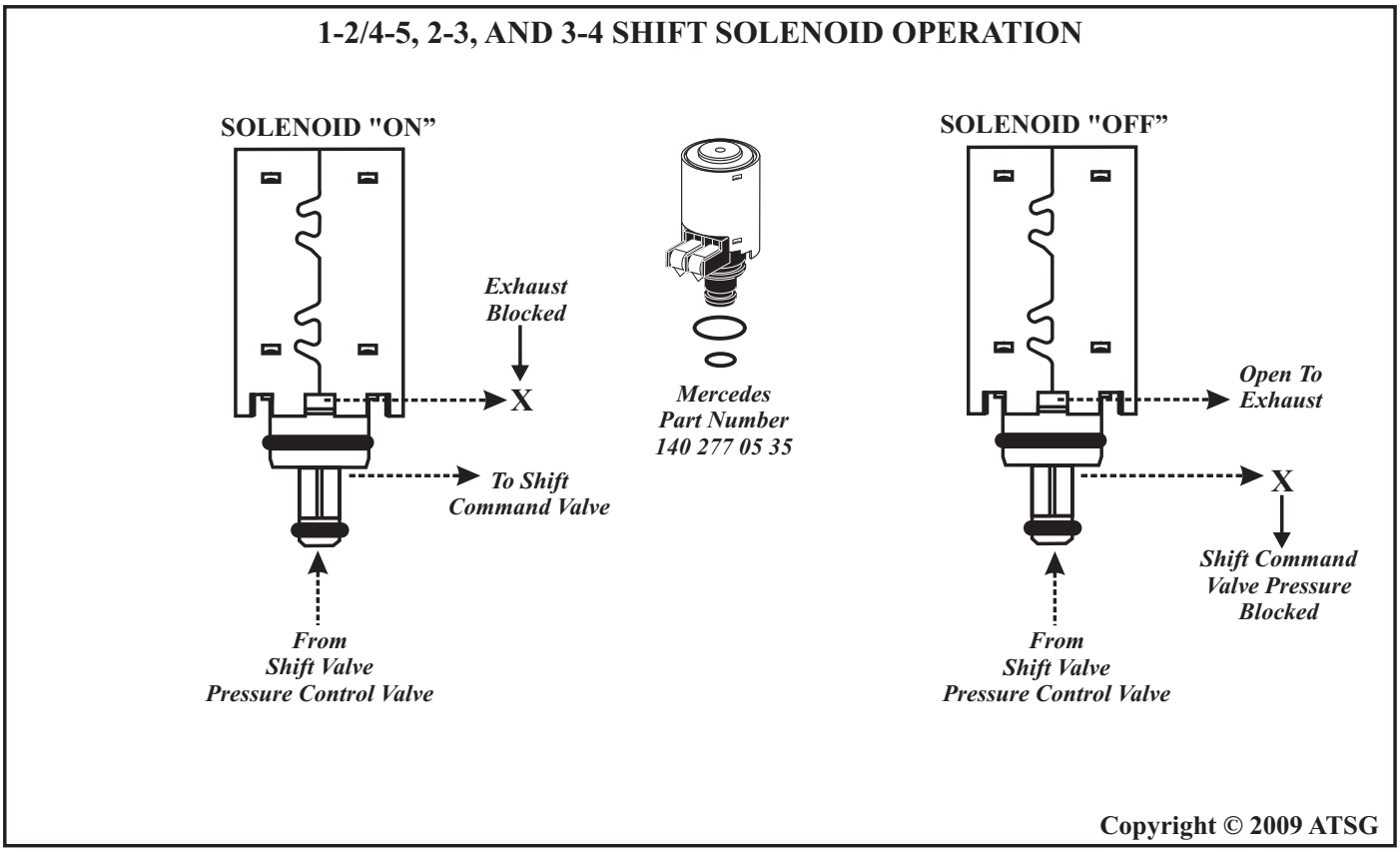


Figure 14

ELECTRONIC COMPONENTS (CONT'D)

Electrical Conductor Plate

The Electrical Conductor Plate consists of a plastic shell which houses six solenoids, all of the solenoid terminals, 2 RPM sensors, the park/neutral contact, transmission fluid temperature sensor, and a 13 pin connector that estabishes the connection to the vehicle harness and the TCM.

Conductor tracks integerated into the plastic shell connect all of the internal components to 13-way connector.

With the exception of the six solenoids, all other electronic components are integrated and part of the electrical conductor plate (See Figure 15).

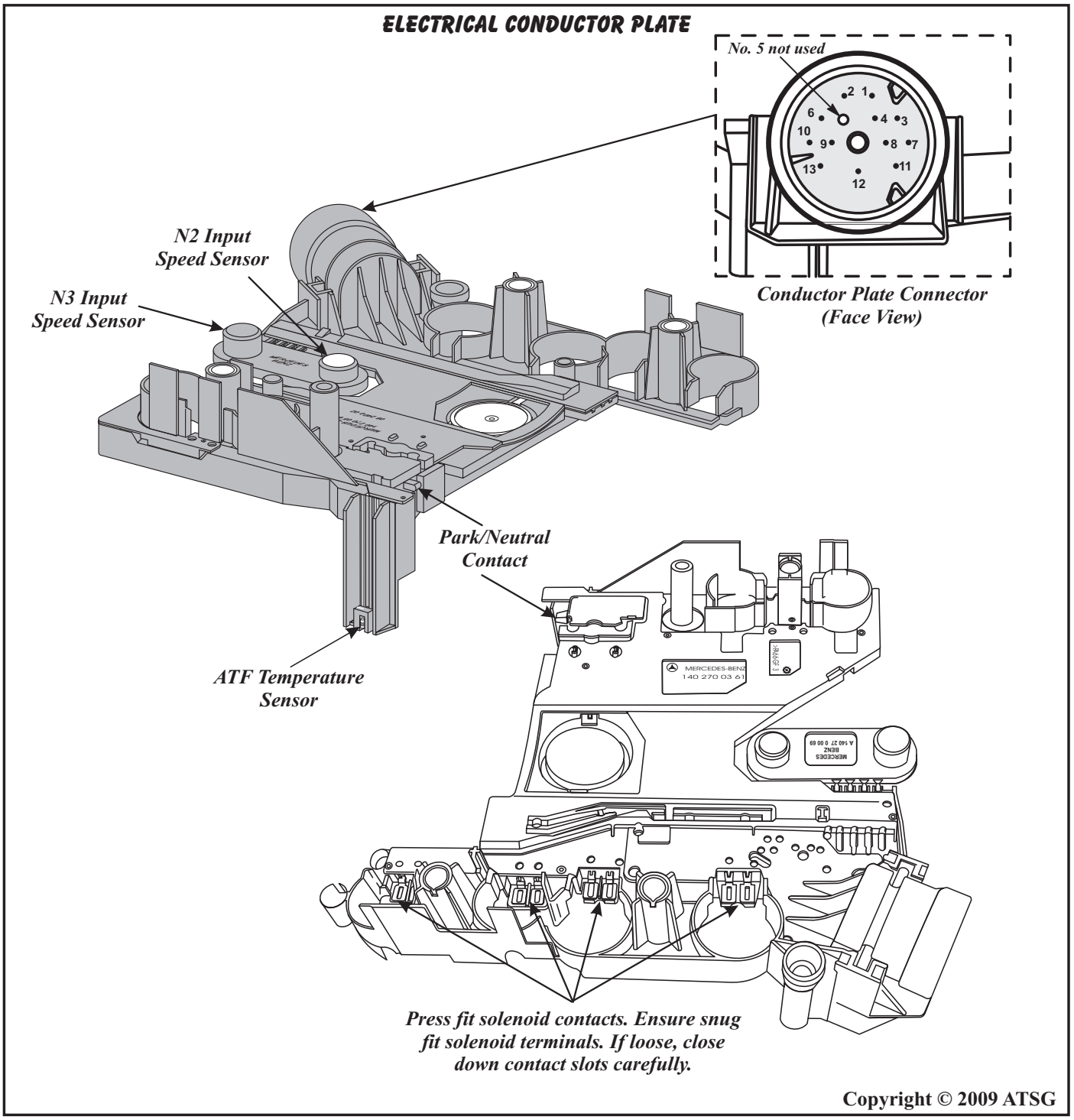


Figure 15

ELECTRONIC COMPONENTS (CONT'D)

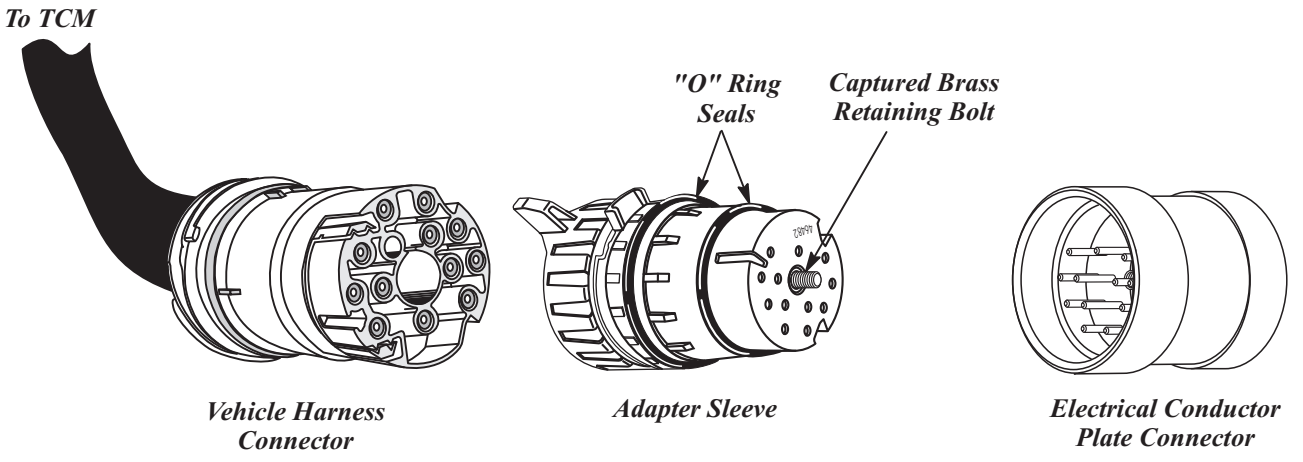
Case Connector Terminal Identification

The case electrical connection is unique in that it has an adapter sleeve that slips over the electrical connector plate connector and sealed with two "O" ring seals, as shown in Figure 16. It is held in place with a "captured" brass screw. The vehicle harness connector then attaches with a twist and lock style connector.

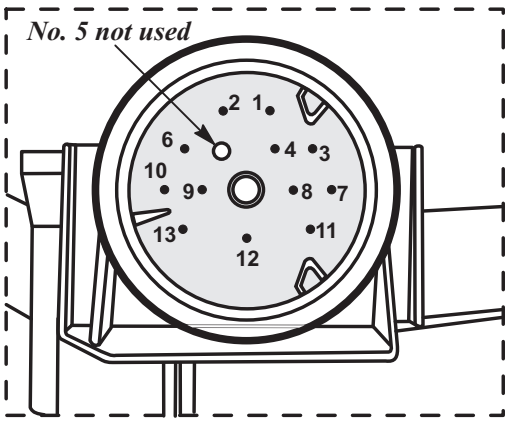
Also shown in Figure 16 is the case connector terminal identification and the function of each wire going into the connector.

Electronic Components
Continued on Page 18

CASE CONNECTOR IDENTIFICATION



Pin	Function
1	N3 Input Speed Sensor Signal
2	Modulation Pressure Control Solenoid Ground Control
3	N2 Input Speed Sensor Signal
4	TFT Sensor and P/N Switch Signal
5	Not Used
6	Battery Supply Voltage For All Solenoids
7	Sensor 5V Supply Voltage
8	2-3 Shift Solenoid Ground Control
9	3-4 Shift Solenoid Ground Control
10	Shift Pressure Control Solenoid Ground Control
11	TCC Solenoid Ground Control
12	Sensor Ground
13	1-2/4-5 Shift Solenoid Ground Control



Electrical Conductor Plate Connector (Face View)

Figure 16

ELECTRONIC COMPONENTS (CONT'D)

Transmission Fluid Temperature Sensor

The Transmission Fluid Temperature (TFT) sensor is located in, and part of, the electrical conductor plate, as shown in Figure 17. Its purpose is to measure the fluid temp and pass that information to the TCM as an input signal. The TFT sensor is wired in series with the Park/Neutral contact. The fluid temperature signal is transferred to the TCM only when the dry-reed contact of the Park/Neutral contact is closed, when in Reverse or a forward gear position. In Park or Neutral the TCM uses engine temperature to avoid setting a DTC. Refer to the chart in Figure 18 to check the TFT using either voltage or resistance.

Note: If check is being made at the TCM, shift lever must be in Reverse or Drive, as engine temp is used in Park and Neutral.

Park/Neutral Contact

The Park/Neutral Contact is located in, and part of, the electrical conductor plate with the plunger protruding, as shown in Figure 17. Its purpose is to transfer information to the TCM as to when the selector lever is in the "P" or "N" positions. When in "P" or "N" the P/N contact is acuated by the inside detent plate. The permanent magnet is moved away from the dry-reed contact. The dry-reed contact is opened, and the TCM recieves an electrical signal that will close the signal to the starter circuit. Cut-Away of the P/N Contact is shown in Figure 17.

Electronic Components
Continued on Page 19

TFT SENSOR AND P/N CONTACT

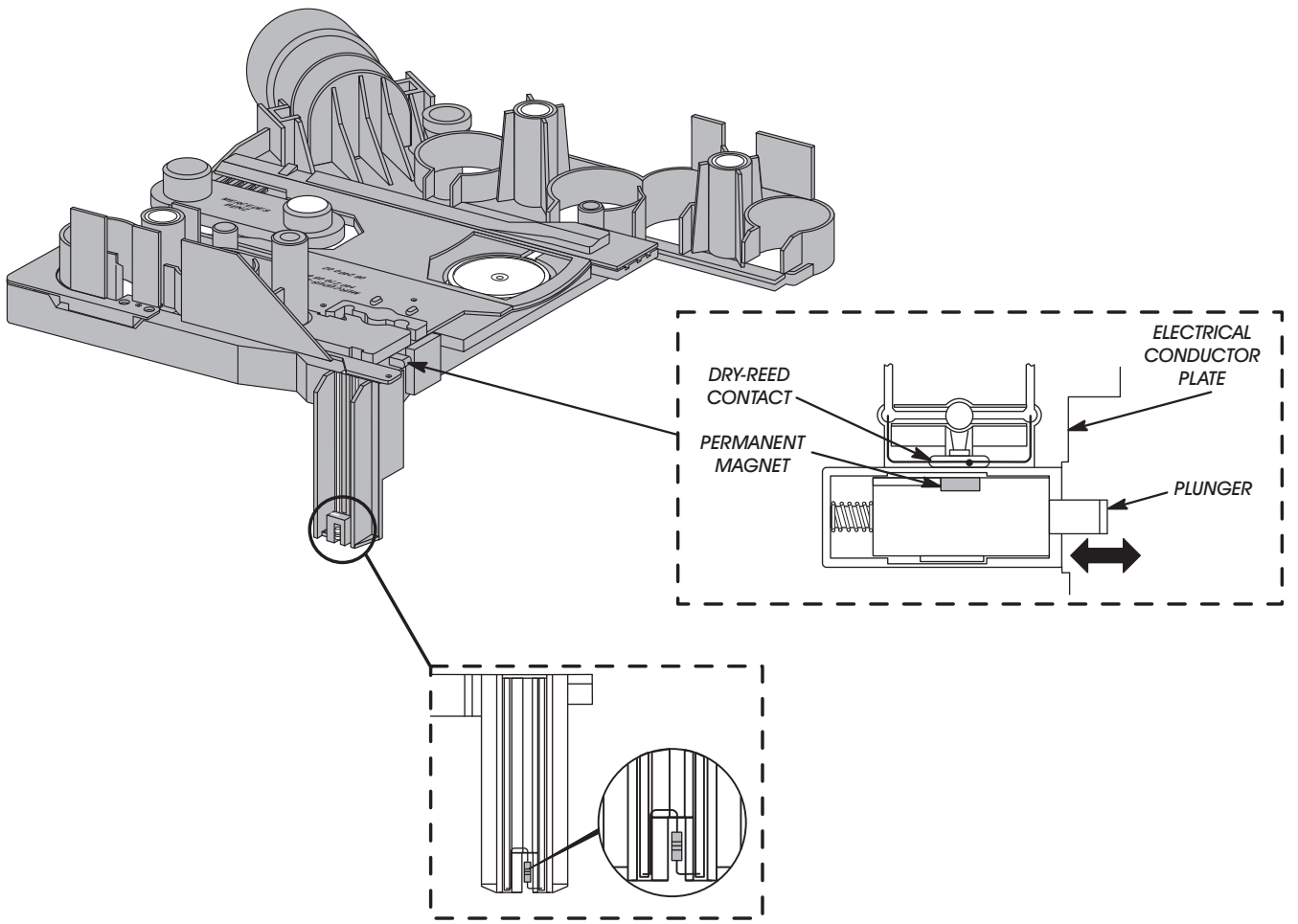


Figure 17

TFT SENSOR CHART		
ATF TEMP	VOLTAGE	RESISTANCE
-40C (-40F)	0.80	564.0
-30C (-22F)	0.88	624.0
-20C (-4F)	0.95	686.0
-10C (14F)	1.02	750.0
0C (32F)	1.09	817.0
10C (50F)	1.16	886.0
20C (68F)	1.23	957.0
30C (86F)	1.30	1032.0
40C (104F)	1.37	1109.0
50C (122F)	1.44	1189.0
60C (140F)	1.51	1273.0
70C (158F)	1.58	1306.0
80C (176F)	1.65	1450.0
90C (194F)	1.72	1545.0
100C (212F)	1.79	1644.0
110C (230F)	1.86	1747.0
120C (248F)	1.93	1855.0
130C (266F)	2.00	1968.0
140C (284F)	2.08	2087.0
150C (302F)	2.15	2211.0
160C (320F)	2.22	2276.0
170C (338F)	2.29	2479.0

Figure 18

ELECTRONIC COMPONENTS (CONT'D)

N2 and N3 Input Speed Sensors

The 722.6 transmission uses 2 input speed sensors referred to as N2 and N3. Both speed sensors are located in the electrical conductor plate, as shown in Figure 19. The speed sensors are Hall Effect speed sensors that are used by the TCM to calculate the transmissions input speed. Since the input speed could not be measured directly, two of the drive elements are measured. N2 records the speed of the front sun gear and N3 records the speed of the front planetary carrier. Two input speed sensors were required because both drive elements are not active in all gears. The input sensors N2 and N3 will report the same input speed in 2nd, 3rd or 4th gear. If the N2 and N3 input speed signals are not the same in these gears, then there is an issue with the transmission and the DTC for "Input Speed Sensors Mismatch" will be set.

The N3 input speed sensor is not reported in 1st and 5th gears. The N2 input speed sensor is not reported in Reverse. The Input Speed Sensor Overspeed is a rationality check that is intended to indicate a major transmission failure and will cause a loss of drive, with transmission going to neutral.

Electronic Components
Continued on Page 20

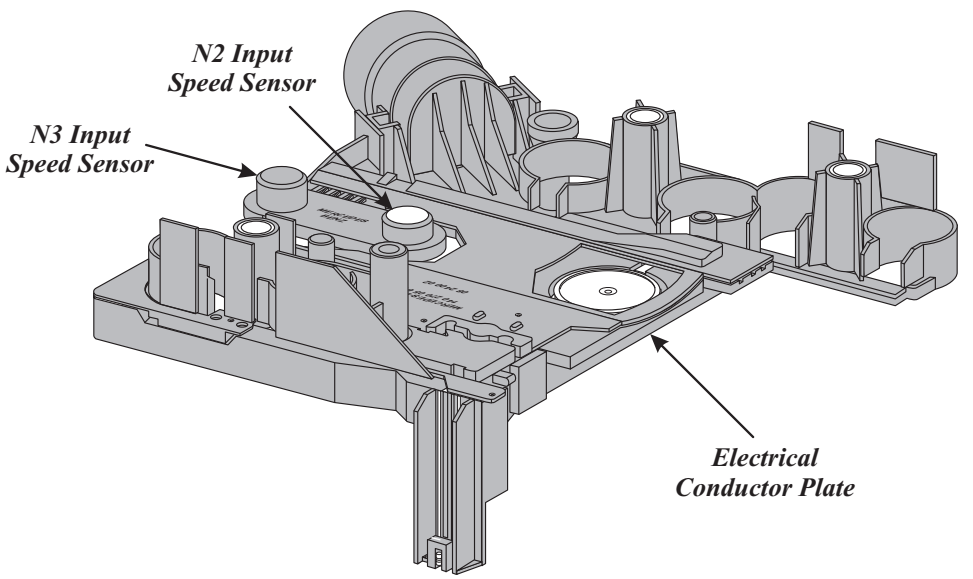


Figure 19

ELECTRONIC COMPONENTS (CONT'D)

Transmission Control Module (TCM)

The 722.6 electronic operated transmission is controlled by a Transmission Control Module (TCM) and has a fully adaptive control system. The system performs its functions based on real time sensor and switch feedback information. In addition the TCM recieves information from the Shift Lever Assembly (SLA), Engine Control Module (ECM) and Anti-lock Brake System (ABS) controllers over the CAN bus. The CAN bus is a high speed comunication bus that allows real time control capability between various controllers. Most messages are sent every 20 milliseconds. This allows critical information to be shared with the SLA, ECM and ABS controllers. The CAN bus uses a twisted pair of wires in the harness to reduce the potential of radio and noise interference.

The control system automatically adapts to changes in engine performance, vehicle speed, and transmission temperature variations to provide consistant shift quality. The control system ensures that clutch operation during upshifting and downshifting is more responsive without increased harshness. The TCM controls the actuation of the solenoids for modulating shift pressure and gear change. The required pressure level is calculated from the load condition and engine speed. Power for the transmission system is supplied through the Transmission Relay to the TCM.

Note: The TCM is the same type between the Mercedes and Chrysler vehicle applications, right down to the connectors and the terminal numbers. Obviously calibrations are different between the various models.

Transmission Control Module (TCM) locations for the various vehicle applications are illustrated in Figure 21.

The TCM continuously checks for electrical concerns, mechanical concerns, and some hydraulic concerns. When a transmission concern is detected, the TCM stores a Diagnostic Trouble Code (DTC). Some of these codes cause the transmission to go into "Limp-In" or Default mode. The transmission will default in the current gear if a DTC is detected, then after a key cycle, or a shift to Park, the transmission will go into "Limp-In" which is 2nd or 3rd gear, depending on model. Some DTC's may allow the transmission to resume normal operation, or recover, if the detected concern goes away.

Permanent "Limp-In" DTC will recover when the key is cycled, but if the same DTC is detected for three key cycles, the system will not recover and the DTC must be cleared from the TCM using the proper scanner. The "Typical" TCM is shown in Figure 20.

TRANSMISSION CONTROL MODULE (TCM)

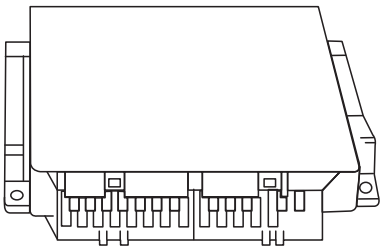


Figure 20

Limp Mode Operation

Certain malfunctions will cause the transmission to enter limp mode at which time a diagnostic trouble code will be stored. Should an electrical fault occur, the last selected gear will be the gear the transmission remains in until the vehicle is stopped, the engine is turned off, 10 seconds have passed and the engine is restarted. At this time 2nd gear will be hydraulically available. Some models it will be 3rd gear hydraulically available. In all situations reverse is also available.

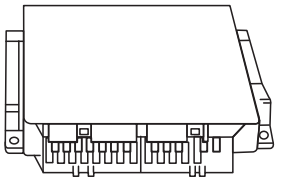
Limp mode remains active until the malfunction is eliminated, or in some cases the key is cycled. In some cases limp mode is canceled because the fault is no longer present.

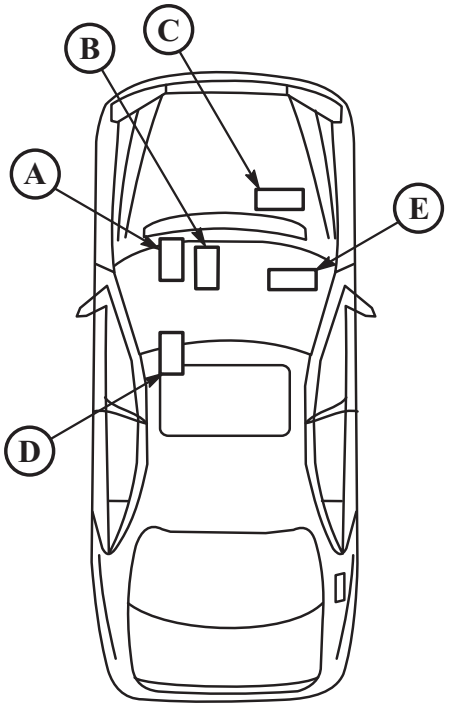
Loss of Drive

If the TCM detects a situation that has resulted in or may result in engine or transmission failure the transmission will be placed in neutral. Improper Ratio, Input Sensor Overspeed, or Engine Overspeed DTC's will create a loss of Drive.

TRANSMISSION CONTROL MODULE LOCATIONS

Transmission Control Module (TCM)





VEHICLE	*TCM Location*
Mercedes 163 Chasis (M Series); TCM mounted on the floor, center of the console in position "B"	*B*
Mercedes 140, 210 and 220 Chasis; TCM mounted in Electrical Box in engine compartment in position "C"	*C*
Mercedes 129, 170, 202 and 208 Chasis; TCM mounted under the passenger side floor panel in position "E"	*E*
Chrysler Sprinter; TCM mounted under the drivers seat in position "D"	*D*
Chrysler Crossfire; TCM mounted under the passenger side floor panel in position "E"	*E*
Dodge Magnum; TCM mounted below the steering column in position "A"	*A*
Chrysler 300C; TCM mounted below the steering column in position "A"	*A*
Grand Cherokee; TCM mounted below the steering column in position "A"	*A*

Figure 21

ELECTRICAL AND RESISTANCE CHECKS

Electrical and resistance checks can be easily as the TCM is located in one of five areas, as shown in Figure 21. The only one that is troubling for the technician is the one in the Sprinter, which is underneath the drivers seat. The TCM is small in size when compared to other control modules on board the vehicle. It measures approximately 5-1/4" X 4-1/4" X 3/4". There are two connectors which plug into the TCM and are identified in Figure 22. The face of the connectors have the terminal numbers embossed in them for circuit identification and also shown in Figure 22.

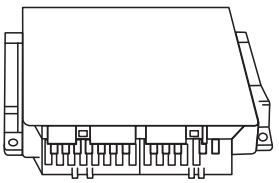
With the TCM connectors disconnected, many of the internal components can be checked for proper resistance readings. If a specific wire is a concern or needs to be inspected, continuity checks can also be easily accomplished between the TCM and the vehicle harness at the 13-way connector.

We have provided you with a chart in Figure 23 with the resistance specifications for the solenoids.

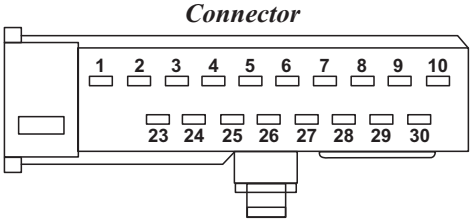
Electronic Components
Continued on Page 24

MERCEDES AND CHRYSLER TCM CONNECTOR AND TERMINAL IDENTIFICATION

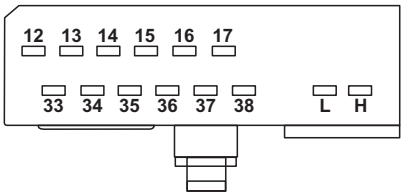
Transmission Control Module (TCM)



TCM "C1" Connector

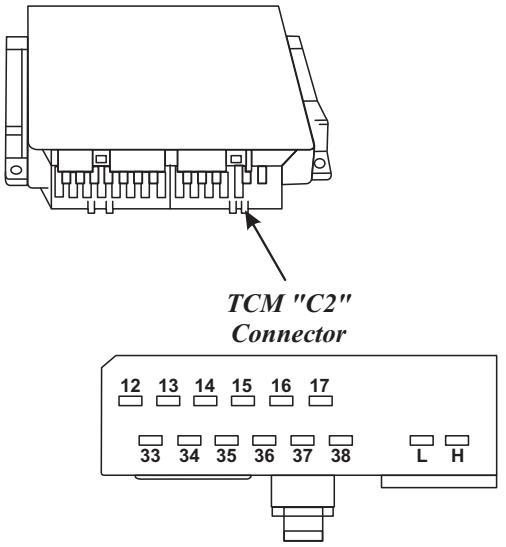


TCM "C2" Connector



TCM		Terminal Function
Conn	Term	
C1	1	Diagnostic Output To Data Link Connector
C1	2	Kickdown Switch
C1	3	Winter/Standard Program Switch
C1	4	Reverse/Park Lock Solenoid
C1	5 & 6	Not Used
C1	7	Passenger Fuse And Relay Module Box
C1	8	Not Used
C1	9	Stop Lamp Input
C1	10	Not Used
C2	12	N2 Input Speed Sensor Signal
C2	13	Sensor 5V Voltage Supply
C2	14	1-2/4-5 Shift Solenoid Ground Signal
C2	15	3-4 Shift Solenoid Ground Signal
C2	16	2-3 Shift Solenoid Ground Signal
C2	17	TCC (PWM) Solenoid Ground Signal
C1	23 & 24	Not Used
C1	25	Transmission Range Recognition Switch (Data "A") (96-99 Only - 2000-Up They use CAN bus)
C1	26	Transmission Range Recognition Switch (Data "B") (96-99 Only - 2000-Up They use CAN bus)
C1	27	Transmission Range Recognition Switch (Data "C") (96-99 Only - 2000-Up They use CAN bus)
C1	28	Transmission Range Recognition Switch (Data "D") (96-99 Only - 2000-Up They use CAN bus)
C1	29	Transmission Control Module (TCM) Voltage Supply
C1	30	Transmission Control Module (TCM) Ground
C2	33	N2 & N3 Input Speed Sensor - TFT Sensor Ground
C2	34	TFT Temp Sensor - P/N Switch Signal
C2	35	N3 Input Speed Sensor Signal
C2	36	Modulation Pressure Control (MPC) Solenoid Ground Signal
C2	37	Shift Pressure Control (SPC) Solenoid Ground Signal
C2	38	Battery Voltage Supply to All Solenoids
C2	L	CAN Bus Data Line Low (-)
C2	H	CAN Bus Data Line High (+)

Figure 22

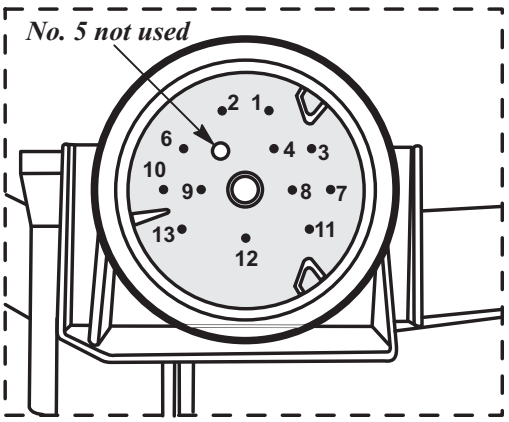


SOLENOID OHMS TEST AT THE TCM OR CASE CONNECTOR

TCM Term No's.	Component	Electrical Conductor Plate Term No's.	Resistance Specification
14 & 38	1-2/4-5 Shift Solenoid	6 & 13	2.5 - 6.5 Ohms
15 & 38	3-4 Shift Solenoid	6 & 9	2.5 - 6.5 Ohms
16 & 38	2-3 Shift Solenoid	6 & 8	2.5 - 6.5 Ohms
17 & 38	TCC (PWM) Solenoid	6 & 11	2.0 - 4.0 Ohms
36 & 38	Modulation Pressure Control (MPC) Solenoid	6 & 2	2.5 - 6.5 Ohms
37 & 38	Shift Pressure Control (SPC) Solenoid	6 & 10	2.5 - 6.5 Ohms
13 & 34	TFT Sensor	4 & 7	See Chart - Figure 18

ELECTRICAL CONDUCTOR PLATE CONNECTOR TERMINAL IDENTIFICATION

Pin	Function
1	N3 Input Speed Sensor Signal
2	Modulation Pressure Control Solenoid Ground Control
3	N2 Input Speed Sensor Signal
4	TFT Sensor and P/N Switch Signal
5	Not Used
6	Battery Supply Voltage For All Solenoids
7	Sensor 5V Supply Voltage
8	2-3 Shift Solenoid Ground Control
9	3-4 Shift Solenoid Ground Control
10	Shift Pressure Control Solenoid Ground Control
11	TCC Solenoid Ground Control
12	Sensor Ground
13	1-2/4-5 Shift Solenoid Ground Control



Electrical Conductor Plate Connector (Face View)

Figure 23

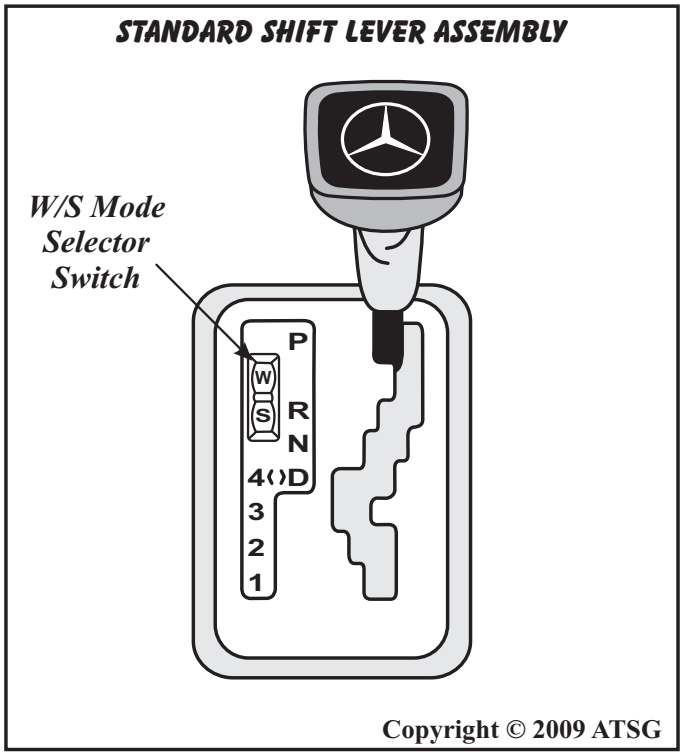


Figure 24

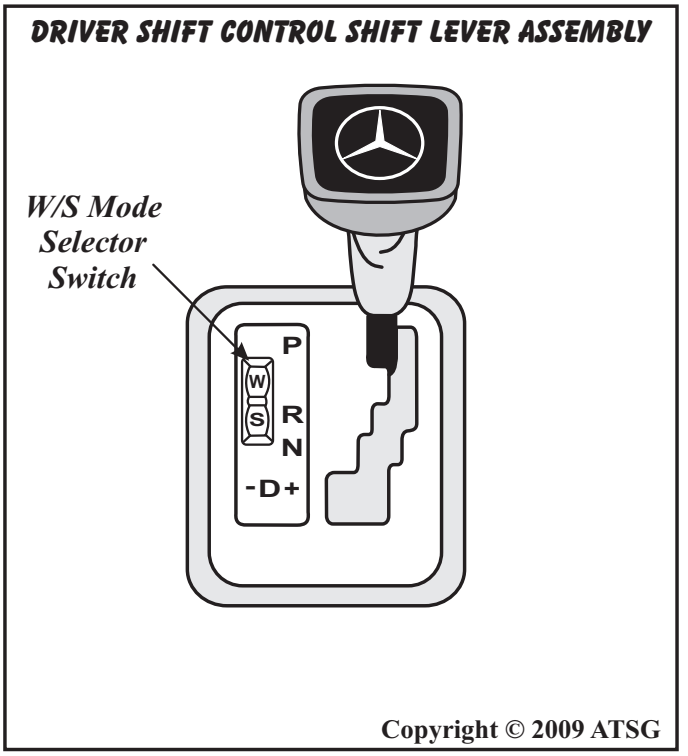


Figure 25

SHIFT LEVER ASSEMBLY

The transmission Shift Lever Assemblies vary by model. There may be four to eight different positions shown on the shift quadrants, as shown in Figure 24 and Figure 25. All are equipped with a W/S Mode Selector Switch and a Transmission Range Recognition Switch (TRRS).

W/S Mode Selector Switch Operation

"S" This is a Standard driving program which will provide a first gear start when in the 4<>D or the -D+ selector position. When the Reverse position is selected, a 3.16:1 ratio is available.

"W" This is a Winter driving program which will provide a second gear start when in the 4<>D or the -D+ selector position. When the Reverse position is selected, a 1.93:1 ratio is available. The Winter mode is to increase the probability of removing the vehicle from a stuck condition.

Vehicle Towing

If the vehicle must be flat towed, it should be done with only the "N" position selected, for a maximum towing range of 32 miles (50 km), at a maximum speed of 32 mph (50 km/h).

Standard Shift Lever Assembly

P - Park position enables the engine to be started while preventing the vehicle from moving. For safety reasons, the vehicle's parking brake should always be used in addition to the "Park" position.

R - Reverse enables the vehicle to be operated in a rearward direction.

N - Neutral position enables the engine to start and operate without driving the vehicle. If necessary, this position should be selected to restart the engine while the vehicle is moving.

4<>D - Drive range should be used for all normal driving conditions for maximum efficiency and fuel economy. Drive range allows the transmission to operate in each of the five forward gear ratios. Downshifts to a lower gear are available for safe passing, by depressing the accelerator, or by manually selecting a lower gear with the shift lever.
In this position the Driver has the option to push the lever to the left or to the right. To the right would allow a shift sequence up to 5th gear while pushed to the left side would inhibit 5th gear.

Continued on Page 25

SHIFT QUADRANTS (CONT'D)

Standard Shift Quadrant (Cont'd)

4 - Manual 4th can be selected for congested traffic and hilly terrain. It has the same 1st gear starting ratio as the "D" range, automatic shifts 1st thru 4th gear, but prevents the transmission from shifting into 5th gear.

3 - Manual 3rd can be selected for congested traffic and hilly terrain. It has the same 1st gear starting ratio as the "D" range, automatic shifts 1st thru 3rd gear, but prevents the transmission from shifting above 3rd gear.

2 - Manual 2nd just adds more performance for congested traffic and hilly terrain. It has the same starting ratio (1st gear) as the Drive range, but prevents the transmission from shifting above 2nd gear. Manual 2nd can be used to retain 2nd gear for acceleration and engine braking as desired. Manual 2nd can be selected at any vehicle speed, but will downshift into 2nd gear, only if vehicle speed is low enough not to over-rev the engine. This speed is calibrated in the TCM.

1 - Manual 1st has the same starting ratio as Drive range but prevents the transmission from shifting above 1st gear. Manual 1st can be used for heavy towing and engine braking as desired. Manual 1st can be selected at any vehicle speed but will downshift into 1st gear, only if vehicle speed is low enough not to over-rev the engine. This speed is calibrated in the TCM.

SHIFT LEVER ASSEMBLY (CONT'D)

Driver Shift Control (DSC) Shift Lever Assembly

Some vehicles are equipped with Driver Shift Control (DSC) version of the selector system, as shown in Figure 25. This configuration allows the driver to manually shift between forward gears, when the selector lever is in the **- D +** range.

P - Park position enables the engine to be started while preventing the vehicle from moving. For safety reasons, the vehicle's parking brake should always be used in addition to the "Park" position.

Driver Shift Control (DSC)
Shift Lever Assembly (Cont'd)

R - Reverse enables the vehicle to be operated in a rearward direction.

N - Neutral position enables the engine to start and operate without driving the vehicle. If necessary, this position should be selected to restart the engine while the vehicle is moving.

- D + - Drive range should be used for all normal driving conditions for maximum efficiency and fuel economy. Drive range allows the transmission to upshift and downshift in each of the five forward gear ratios, according to the normal shift pattern that is programed in the TCM.

When in this range, the driver may also manually select the range of gears by tapping the selector lever towards "+" or "-" to cause an upshift or downshift, as shown in Figure 25 on Page 24. The transmission will shift up or down depending on the request that is made by tapping the selector lever.

Limp Mode Operation

Certain malfunctions will cause the transmission to enter limp mode at which time a diagnostic trouble code will be stored. Should an electrical fault occur, the last selected gear will be the gear the transmission remains in until the vehicle is stopped, the engine is turned off, 10 seconds have passed and the engine is restarted. At this time 2nd gear will be hydraulically available. Some models it will be 3rd gear hydrauically available. In all situations reverse is also available.

Limp mode remains active until the malfunction is eliminated, or in some cases the key is cycled. In some cases limp mode is canceled because the fault is no longer present.

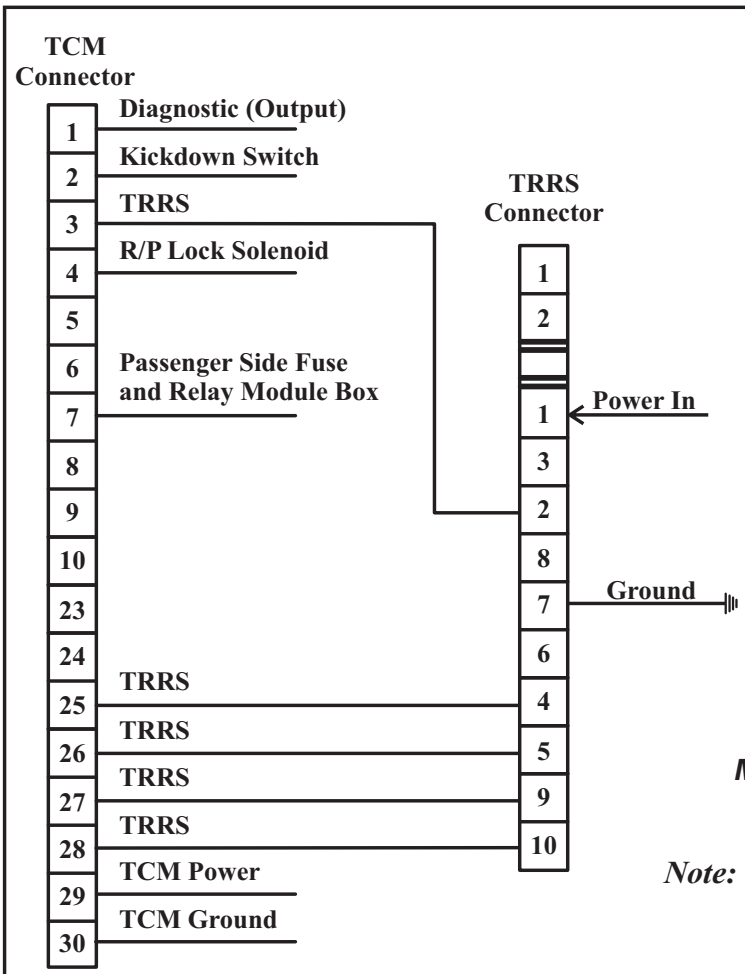
ELECTRONIC COMPONENTS (CONT'D)

Transmission Range Recognition Switch (TRRS)

The Shift Lever Assembly mechanism as shown in Figure 24 and Figure 25, also contains an electrical Transmission Range Recognition Switch (TRRS) and the Park/Lock Solenoid. The TRRS informs the TCM of the shift lever position. The 1996 to 1999 models are "hard wired" to the TCM. The 2000-Up models have the TRRS signals sent to the TCM via the CAN bus system and require the proper scanner to moniter and test.

With the TRRS being an integral part of the gear Shift Lever Assembly mechanism which is located on the floor in the center console, rain water from an open sun roof, a coffee or soda spill is all it takes to damage this switch. The TRRS is a commonly failed device that produces complaints such as delayed engagements or no up-shifts. The no up-shift complaint is at times, accompanied with the TRRS switch manual low indicator light stuck on regardless of the selector lever position.

With the face plate removed, the TRRS circuit board can be easily seen. This circuit board has attached to it wires which run to a connector in the rear of the assembly. Shown in Figure 26 is a wiring diagram which could be used to assist in diagnosing the TRRS from the TCM connector. However, should the TRRS switch need to be replaced, the entire Shift Lever Assembly must be purchased.



Hexadecimal Chart

Shifter Position	Approximate Voltage at the TCM Connector Pin No.			
	25	26	27	28
P	10	10	10	0
R	0	10	10	10
N	10	0	10	10
D	0	0	10	0
4	0	0	0	10
3	0	10	0	0
2	10	0	0	0
1	10	10	0	10

Measured with the TCM connector unplugged and the ignition in the "ON" position.

Note: This test applies only to 1996-1999 models. 2000-Up models require the proper scanner.

Figure 26

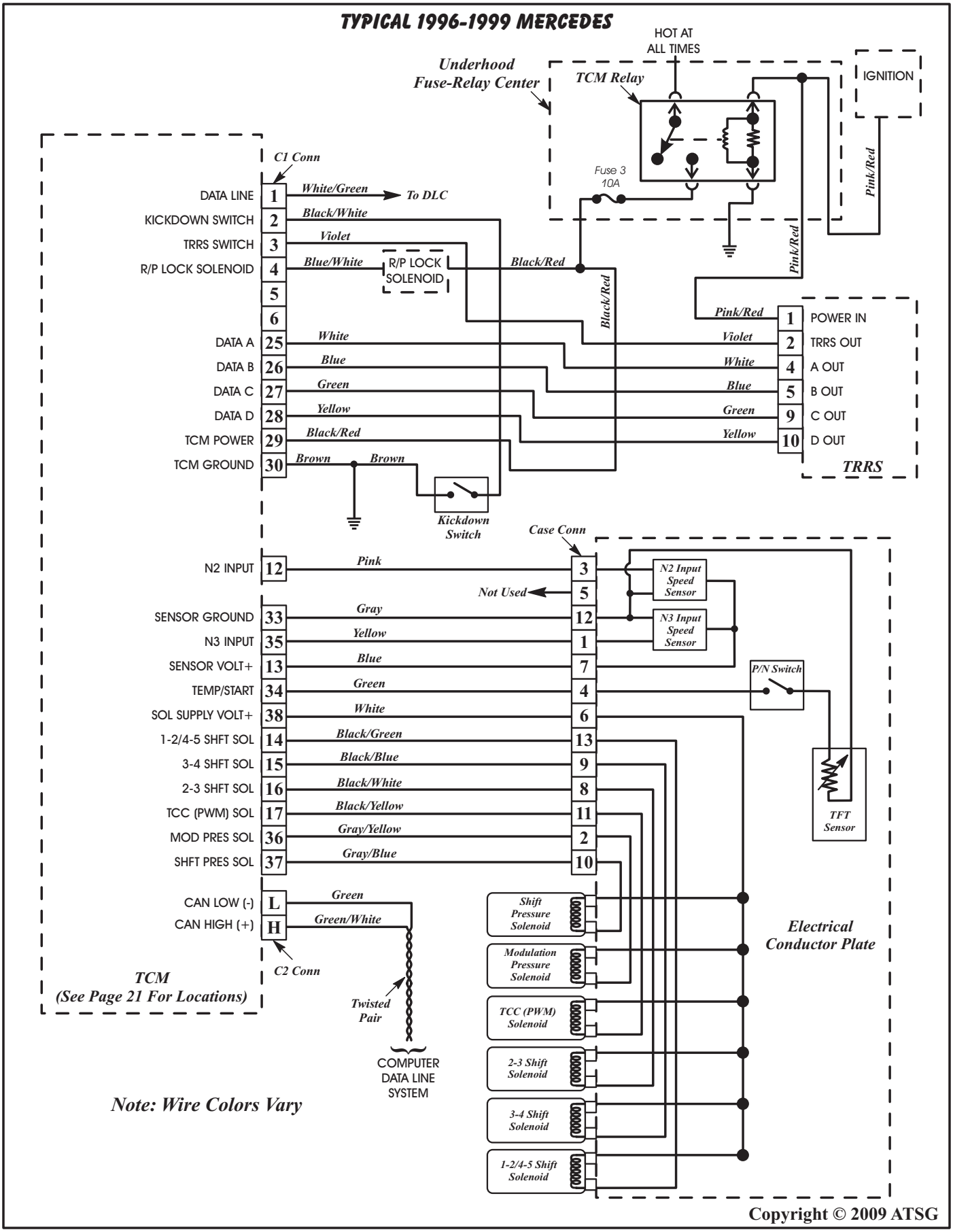

TYPICAL 1996-1999 MERCEDES
HOT AT ALL TIMES
Underhood Fuse-Relay Center
TCM Relay
IGNITION
Fuse 3 10A
Pink/Red
C1 Conn
DATA LINE 1 White/Green To DLC
KICKDOWN SWITCH 2 Black/White
TRRS SWITCH 3 Violet
R/P LOCK SOLENOID 4 Blue/White
R/P LOCK SOLENOID
Black/Red
5
6
DATA A 25 White
DATA B 26 Blue
DATA C 27 Green
DATA D 28 Yellow
TCM POWER 29 Black/Red
TCM GROUND 30 Brown Brown
Kickdown Switch
Pink/Red 1 POWER IN
Violet 2 TRRS OUT
White 4 A OUT
Blue 5 B OUT
Green 9 C OUT
Yellow 10 D OUT
TRRS
Case Conn
N2 INPUT 12 Pink
Not Used 3 5
SENSOR GROUND 33 Gray
N3 INPUT 35 Yellow
SENSOR VOLT+ 13 Blue
TEMP/START 34 Green
SOL SUPPLY VOLT+ 38 White
1-2/4-5 SHFT SOL 14 Black/Green
3-4 SHFT SOL 15 Black/Blue
2-3 SHFT SOL 16 Black/White
TCC (PWM) SOL 17 Black/Yellow
MOD PRES SOL 36 Gray/Yellow
SHFT PRES SOL 37 Gray/Blue
12 1 7 4 6 13 9 8 11 2 10
N2 Input Speed Sensor
N3 Input Speed Sensor
P/N Switch
TFT Sensor
CAN LOW (-) L Green
CAN HIGH (+) H Green/White
C2 Conn
TCM
(See Page 21 For Locations)
Twisted Pair
COMPUTER DATA LINE SYSTEM
Shift Pressure Solenoid
Modulation Pressure Solenoid
TCC (PWM) Solenoid
2-3 Shift Solenoid
3-4 Shift Solenoid
1-2/4-5 Shift Solenoid
Electrical Conductor Plate
Note: Wire Colors Vary
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Figure 27

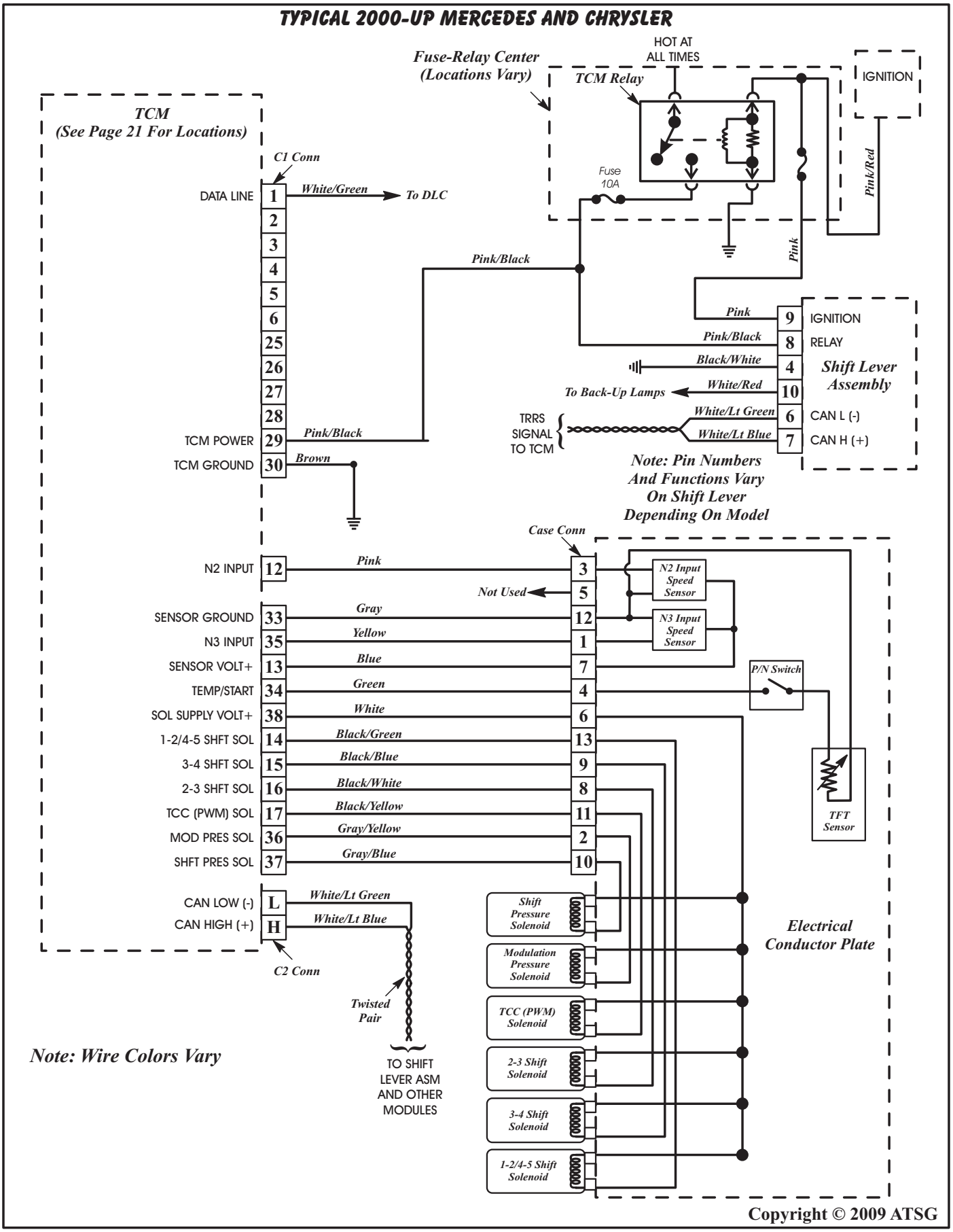
TYPICAL 2000-UP MERCEDES AND CHRYSLER
Fuse-Relay Center (Locations Vary)
HOT AT ALL TIMES
TCM Relay
IGNITION
Pink/Red
Fuse 10A
Pink
TCM (See Page 21 For Locations)
C1 Conn
DATA LINE
1
White/Green
To DLC
2
3
4
5
6
25
26
27
28
TCM POWER
29
Pink/Black
TCM GROUND
30
Brown
Pink/Black
Pink
9
IGNITION
Pink/Black
8
RELAY
Black/White
4
Shift Lever Assembly
To Back-Up Lamps
White/Red
10
TRRS SIGNAL TO TCM
White/Lt Green
6
CAN L (-)
White/Lt Blue
7
CAN H (+)
Note: Pin Numbers And Functions Vary On Shift Lever Depending On Model
Case Conn
N2 INPUT
12
Pink
3
N2 Input Speed Sensor
Not Used
5
SENSOR GROUND
33
Gray
12
N3 Input Speed Sensor
N3 INPUT
35
Yellow
1
SENSOR VOLT+
13
Blue
7
P/N Switch
TEMP/START
34
Green
4
SOL SUPPLY VOLT+
38
White
6
1-2/4-5 SHFT SOL
14
Black/Green
13
3-4 SHFT SOL
15
Black/Blue
9
2-3 SHFT SOL
16
Black/White
8
TFT Sensor
TCC (PWM) SOL
17
Black/Yellow
11
MOD PRES SOL
36
Gray/Yellow
2
SHFT PRES SOL
37
Gray/Blue
10
CAN LOW (-)
L
White/Lt Green
CAN HIGH (+)
H
White/Lt Blue
C2 Conn
Twisted Pair
TO SHIFT LEVER ASM AND OTHER MODULES
Shift Pressure Solenoid
Modulation Pressure Solenoid
TCC (PWM) Solenoid
2-3 Shift Solenoid
3-4 Shift Solenoid
1-2/4-5 Shift Solenoid
Electrical Conductor Plate
Note: Wire Colors Vary
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Figure 28

DIAGNOSTIC TROUBLE CODES (DTC'S)

We have divided the DTC charts into two different catagories. The Mercedes chart which covers "all" of their known codes, beginning on Page 30 and the Daimler/Chrysler updated OBD-II code chart beginning on Page 32.

The Shift Lever Assembly (SLA) specific codes are shown on Page 31.

The Mercedes code chart can be very confusing at times, so we have provided some "instructions" or a legend to assist you in understanding the chart.

Please read or refer to the instructions below before you go to the Mercedes code chart. The Daimler/Chrysler OBD-II code chart is a typical OBD-II code chart and they have refined the the code descriptions.

HOW TO READ THE MERCEDES DTC CHART

DTC Column

All 1 or 2 digit DTC's between 2 and 65 are actual Mercedes fault codes at the time of code retrieval.

DTC "INT" Column

All DTC codes higher than 96 are fault codes that occured previously, or Intermittently.
Example: A code 2 that occured previously would be displayed as 98 (2 + 96).

DTC OBD Column

All codes in this column are OBD II codes that are found in the U.S. only, on OBD II compliant vehicles, and are equal to the Mercedes 2 digit codes.

"Limp Mode" Column

An X in this column means that it is a code that puts the transmission in "Full Limp Mode", transmission does not shift, remains in the same gear as when the fault occured. After moving the shift lever to the Park position, cycle ignition to OFF, wait 10 seconds and restart engine. Transmission will now be in 2nd gear (3rd gear some models) and reverse will be available. To restore transmission function, if the fault is nonexistent, you must use the proper scanner to clear the codes, cycle ignition to OFF and restart engine.

An A in this column means, Limp Mode only when faults 22 and 23 occur simultaneously. With implausible input, TCM defaults to a pre-programmed, fixed, substitution value, (L/RR, R/RR = 2500 rpm).

A B in this column means, with implausible signal input, TCM defaults to a pre-programmed, fixed substitution value.

A C in this column means, with implausible signal input, TCM defaults to a variable substitution value, with loss of one rear wheel speed sensor input.

A D in this column means, with implausible signal input, TCM defaults to a variable substitution value, from other half of engine control.

An E in this column means, delayed starting.

An F in this column means, fault induces TCM to re-initalize from beginning, or reset.

"Auto Reset" Column

An X in this column means that it's a code that will automatically be eliminated, after fault condition ends.

"Key Reset" Column

An X in this column means that it is a code that can be eliminated by cycling the ignition key OFF to ON.

MERCEDES DIAGNOSTIC TROUBLE CODES

Code descriptions may vary due to the many updates and changes to the TCM.

DTC	DTC "INT"	DTC OBD	DTC DESCRIPTION	Limp Mode	Auto Reset	Key Reset
2	98	P0753	1-2/4-5 Shift Solenoid Circuit	X		
3	99	P0758	2-3 Shift Solenoid Circuit	X		
4	100	P0763	3-4 Shift Solenoid Circuit	X		
5	101	P0743	TCC (PWM) Solenoid Circuit	X		
6	102	P0748	Modulation Pressure Control (MPC) Solenoid Circuit	X		
7	103	P0748	Shift Pressure Control (SPC) Solenoid Circuit	X		
8	104		Reverse/Park (R/P) Solenoid Circuit			X
9	105		Starter Lockout Relay Module			X
10	106	P0702	Solenoid Supply Voltage Out Of Range	X		
11	107	P0715	N2 - N3 Sensor Supply Voltage Out Of Range	X		
12	108	P0715	RPM Sensor N2	X		
13	109	P0715	RPM Sensor N3	X		
14	110	P0715	RPM Sensor N2 To N3 Comparison implausible			
15	111	P0700	Sensor N2 Or N3 Excessive RPM			
17	113	P0705	Transmission Range Recognition Switch (TRRS) Coding Invalid			
18	114	P0705	Transmission Range Recognition Switch (TRRS) Implausible			
18	114		Selector Lever Assembly Position Implausible	X	X	
19	115		TFT Temperature Sensor	C		
20	116		P/N Contact/TFT Sensor Faulty	E		
21	117		TCM Voltage Out Of Range	X	X	
22	118	P0720	CAN: Wheel Speed Sensor, Right Rear Fault	X, A, C	X	
23	119	P0720	CAN: Wheel Speed Sensor, Left Rear Fault	X, A, C	X	
24	120		CAN: Wheel Speed Sensor, Right Front Fault, or Pedal Value Implausible		X	
25	121		CAN: Wheel Speed Sensor, Left Front Fault, or Engine RPM Implausible		X	
26	122		CAN: Accelerator Pedal Position Sensor Fault, or Eng. Torque Implausible	B	X	
27	123		Adjusted Engine or Static Engine Torque Implausible			
28	124		CAN: Engine RPM Implausible	B or D	X	
29	125		CAN: Engine Torque, Right Implausible	B or D	X	
30	126		CAN: Adjust Altitude Implemented or Traction Control Comm Error	B	X	
31	127		Engine Management Torque Implausible or Communication Error			
32	128		CAN: Engine Management Torque Implausible	B or D	X	
33	129		CAN: Throttle Valve Acutator Implausible			
34	130	P0720	CAN: TRRS Mod. (N15/5) Implemented, or Engine Management Fault			
35	131		CAN: ME 1.0, Left, Information Distorted	B or D	X	
36	132		CAN: ME 1.0, Right, Information Distorted	B	X	
36	132		Engine Coolant Temperature Implausible	B	X	
37	133		CAN: Information Totally Distorted	X, B	X	
38	134	P0720	CAN: ESP Information Distorted, or Traction Control	X, B	X	
39	135		CAN: ME 1.0, Right, Information Distorted	B or D	X	
40	136		CAN: Instrument Cluster, Communication Error			
41	137	P0700	Transfer Case Control Module, Communication Fault			
49	145	P0700	Excessive Engine RPM			
50	146	P0700	N3 Input Speed Sensor, Excessive RPM			
51	147	P0700	Engaged Gear Implausible (Transmission Slipping)			X

This Chart Continued on Page 31

Figure 29

MERCEDES DIAGNOSTIC TROUBLE CODES

Code descriptions may vary due to the many updates and changes to the TCM.

DTC	DTC "INT"	DTC OBD	DTC DESCRIPTION	Limp Mode	Auto Reset	Key Reset
52	*148*	*P0700*	*Command Valve Stuck In Pressure Position, or TCC Stuck ON*	*X*		*X*
53	*149*	*P0740*	*Torque Converter Clutch Slipping*	*No TCC*		
54	*150*		*Confirmation Of Transmission Overload Protection Not Recieved*			
55	*151*	*P0730*	*Gear Recognition Repeatedly Negative*	*X*		
56	*152*	*P0702*	*Transmission Control Module (EEPROM, Incorrect Coding)*	*X*		
57	*153*	*P0702*	*Transmission Control Module (Clock)*			
58	*154*	*P0702*	*Transmission Control Module (Internal Watchdog Test)*	*X*		
59	*155*	*P0702*	*Transmission Control Module (External Watchdog Test)*	*X*		
60	*156*	*P0702*	*Transmission Control Module (Internal Function Watchdog)*	*F*		
61	*157*	*P0702*	*Transmission Control Module (External Function Watchdog)*	*F*		
62	*158*	*P0702*	*Transmission Control Module (RAM)*	*X*		
63	*159*	*P0702*	*Transmission Control Module (ROM)*	*X*		
64	*160*	*P0702*	*Transmission Control Module (EEPROM Critical Functions)*	*X*		
65	*161*	*P0702*	*Transmission Control Module (EEPROM Critical Functions)*	*B*		

DATA LINK CONNECTOR (DLC) INFORMATION AND LOCATIONS

There are four different styles of Data Link Connectors, depending on year of production, vehicle model, if the vehicle is equipped with California emissions or if the vehicle is OBD-II compliant.

DLC No. 1 This DLC is located in the engine compartment and is a 16 pin diagnostic connector which will require a "Code Reader" and will produce 2 digit codes.

DLC No. 2 This DLC is located in the engine compartment, same position as DLC No.1, and is very similar in appearance. This DLC is equipped with an L.E.D. Lamp and a push button to retrieve 2 digit codes. This style connector is typically used with California emissions.

DLC No. 3 This DLC is also located in the engine compartment and is a round 38 terminal connector that requires a diagnostic code reader to retrieve 2 digit codes.

DLC No. 4 This DLC is typical 16 terminal OBD-II connector, located under the driver side dash panel. This will require the proper scanner in order to retrieve the typical OBD-II 5 digit codes.

Figure 30

DAIMLER/CHRYSLER OBD-II "SHIFT LEVER ASSEMBLY" DIAGNOSTIC TROUBLE CODES

DTC	DESCRIPTION
P0562	*Battery Voltage Low*
P0563	*Battery Voltage High*
P0607	*TCM Internal Performance*
P0930	*Brake Transmission Shift Interlock (BTSI) Control Circuit Low*
P0931	*Brake Transmission Shift Interlock (BTSI) Control Circuit High*
P2775	*Autostick Upshift Switch Circuit Performance*
P2779	*Autostick Downshift Switch Circuit Performance*

Figure 31

DAIMLER/CHRYSLER OBD-II DIAGNOSTIC TROUBLE CODES	
DTC	**DESCRIPTION**
P0100	*Mass Air Flow Sensor Circuit Fault*
P0105	*Manifold Absolute Pressure Sensor Circuit Fault*
P0110	*Intake Air Temperature Sensor Circuit Fault*
P0115	*Engine Coolant Temperature Sensor Circuit Fault*
P0120	*Throttle Position Sensor Circuit Fault*
P0219	*Engine Overspeed*
P0560	*System Voltage Malfunction*
P0562	*Battery Voltage Low*
P0563	*Battery Voltage High*
P0602	*TCM Programming Error or Not Programmed*
P0604	*TCM Internal RAM*
P0605	*TCM Internal ROM*
P0613	*TCM Internal Processor*
P0642	*Sensor Reference Voltage 1 Circuit Low*
P0643	*Sensor Reference Voltage 1 Circuit High*
P0657	*Solenoid Supply Voltage Circuit*
P0700	*Transmission Control System Malfunction*
P0702	*Transmission Control System Electrical Malfunction*
P0710	*Transmission Fluid Temperature Sensor Circuit*
P0712	*Transmission Fluid Temperature Sensor Low*
P0714	*Transmission Fluid Temperature Sensor Intermittent*
P0717	*N2 Input Speed Sensor Circuit, No Signal*
P0730	*Incorrect Gear Ratio*
P0731	*Gear Ratio Error 1st Gear*
P0732	*Gear Ratio Error 2nd Gear*
P0733	*Gear Ratio Error 3rd Gear*
P0734	*Gear Ratio Error 4th Gear*
P0735	*Gear Ratio Error 5th Gear*
P0740	*Torque Converter Clutch Malfunction*
P0742	*Torque Converter Clutch Stuck ON*
P0743	*TCC Solenoid Circuit*
P0748	*Modulation Pressure Control (MPC) Solenoid Circuit*
P0752	*1-2/4-5 Shift Solenoid*
P0753	*1-2/4-5 Shift Solenoid Circuit*
P0758	*2-3 Shift Solenoid, or Circuit*
P0762	*3-4 Shift Solenoid*
P0763	*3-4 Shift Solenoid Circuit*
P0778	*Shift Pressure Control (SPC) Solenoid Circuit*
P1629	*TCM Internal, Solenoid Supply/Watchdog*
P1631	*TCM Internal, Processor Clock Performance*
P1632	*TCM Internal, Test Internal Watchdog Performance*
P1633	*TCM Internal, Test External Watchdog Performance*
P1634	*TCM Internal, Internal Watchdog Performance*
P1636	*TCM Internal, External Watchdog Performance*
P1637	*TCM Internal, EEPROM Performance*

This Chart Continued on Page 33

Figure 32

DAIMLER/CHRYSLER OBD-II DIAGNOSTIC TROUBLE CODES	
DTC	**DESCRIPTION**
P1638	*TCM Internal, CAN 1 RAM Performance*
P1639	*TCM Internal, CAN 2 RAM Performance*
P1644	*Incorrect Variant Configuration*
P1704	*N2 Input Speed Sensor Overspeed*
P1705	*N3 Input Speed Sensor Overspeed*
P1731	*Incorrect Gear Engaged*
P1747	*CAN Signal From TCM Failure*
P2638	*Torque Management Feedback Signal Performance*
P2767	*N3 Input Speed Sensor Circuit, No Signal*
P2783	*Torque Converter Temperature Too High*
P2784	*Input Speed Sensor N2 & N3 Correlation*
U0002	*CAN C Bus Off Performance*
U0100	*Lost Comunication With ECM/PCM*
U0103	*Lost Comunication With Electronic Gear Shift Module*
U0121	*Lost Comunication With ABS Module*
U0141	*Lost Comunication With Front Control Module*
U0155	*Lost Comunication With Instrument Cluster*
U0164	*Lost Comunication With HVAC Control Module*
U0401	*Implausible Data Recieved From ECM/PCM*
U0404	*Implausible Data Recieved From ESM*
U0415	*Implausible Data Recieved From ABS Module*
U0423	*Implausible Data Recieved From Instrument Cluster*
U0424	*Implausible Data Recieved From HVAC Control Module*
U0431	*Implausible Data Recieved From Front Control Module*
U110B	*Lost Engine Coolant Message*
U1118	*Lost Engine Message*
U1119	*Lost Front Control Module Message*
U1400	*Implausible TPS Signal Recieved*
U1401	*Implausible Engine Speed Signal Recieved*
U1402	*Implausible Engine Temperature Signal Recieved*
U1404	*Implausible Static Engine Torque Signal Recieved*
U1405	*Implausible Minimum Engine Torque Signal Recieved*
U1406	*Implausible Maximum Engine Torque Signal Recieved*
U1407	*Implausible Engine Torque Request Signal Recieved*
U1408	*Implausible Brake Signal Recieved*
U1409	*Implausible Left Front Wheel Speed Signal Recieved*
U140A	*Implausible Right Front Wheel Speed Signal Recieved*
U140B	*Implausible Left Rear Wheel Speed Signal Recieved*
U140C	*Implausible Right Rear Wheel Speed Signal Recieved*
U140D	*Implausible Wheel Speed Signals Recieved*
U140F	*Implausible Engine Variant Data*
U1410	*Implausible or Missing Front Control Module Variant Data*
U1507	*Implausible Engine Temperature Data Length Recieved*
U1509	*Implausible Engine Variant Message Data Length Recieved*
U150A	*Implausible Front Control Module Variant Message Data Length Recieved*

Figure 33