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Less Info

Title: **TerraStar Transfer Case Diagnostic and Operational Information**

Applies To: **TerraStar 4x4 Models**

Description

TerraStar 4x4 model vehicles are built with a FABCO TC-28 transfer case with 4 feedback switches and 2 electric actuators. The body controller monitors the feedback switches to regulate when it grounds each one of the 4 relays that control the amperage and polarity to each of the 2 electric actuators. The transfer case has 3 modes, 4x2 high, 4x4 high, and 4x4 low.

Interlocks To Change Ranges

To shift the transfer case from 4X2 high mode to 4x4 high mode, the following interlocks must be met:

- Key is in the run position
- Engine speed is above programmable parameter 3047, Engine_Operating_Threshold. Default setting is 300 RPM
- Vehicle speed is below programmable parameter 2812, Axle_Engage_Threshold. Default setting is 24 MPH
- Axle differential speed is below programmable parameter 3052, FR2RR_Vel_Diff_ABS_Threshold. Default setting is 0.93 MPH
- Front axle switch is in the upper position and has a good status

To shift the transfer case from 4x4 high mode to 4x4 low mode, the following interlocks must be met:

- Transfer case is in 4x4 high mode
- Vehicle speed is below programmable parameter 3045, Range_Engage_Threshold. Default setting is 3 MPH
- Transmission is in the neutral range
- Service brake is depressed
- Key is in the run position
- Engine speed is above programmable parameter 3047, Engine_Operating_Threshold. Default setting is 300 RPM
- Range switch is in the lower position and has a good status

When shifting from 4x4 high to 4x4 low mode, the front axle indicator lamp in the front axle switch will flash. This is normal operation.

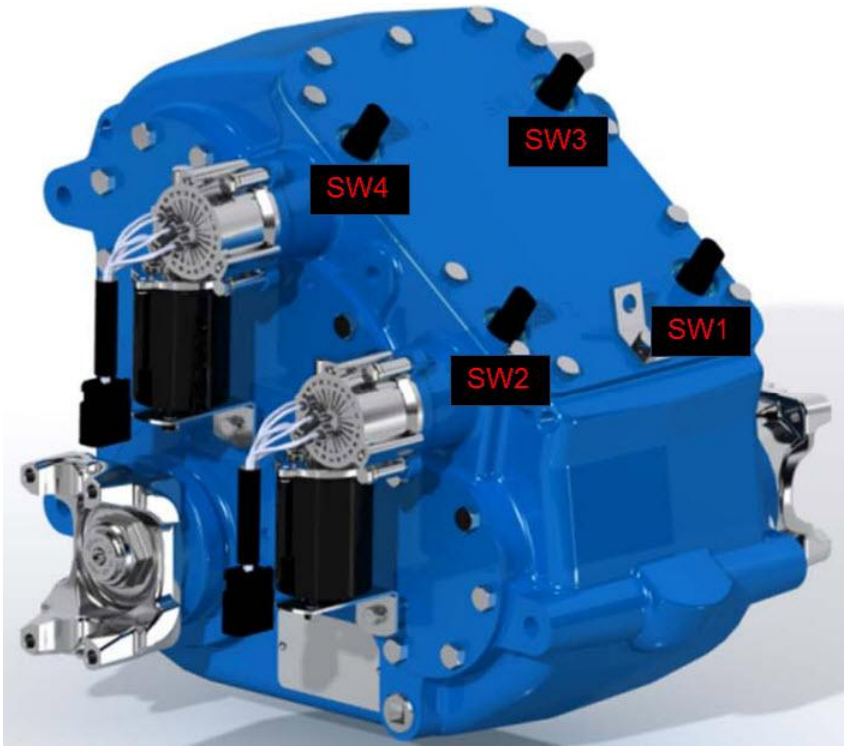
DLB Template

Click HERE for the DLB template for diagnosing this.

Signal Descriptions

Signal	B/C Pin	Transfer case Mode	Description
Xfer_Case_4x4_Cmd	1601-E13	N/A	This is the ground command to the 4x4 relay
Xfer_Case_4x2_Cmd	1601-E9	N/A	This is the ground command to the 4x2 relay
Xfer_Case_High_Cmd	1601-F4	N/A	This is the ground command to the high range relay
Xfer_Case_Low_Cmd	1601-F5	N/A	This is the ground command to the low range relay
Transfer_Case_Front_Axle_Disengaged	1602-F11	Front axle is not engaged when checked in DLB	This is the signal from switch SW1, indicating the transfer case position.
Transfer_Case_Front_Axle_Engaged	1602_F13	Front axle is engaged when checked in DLB	This is the signal from switch SW2, indicating the transfer case position.
Transfer_Case_Driveline_Engaged_Low	1602-F8	Transfer case is in low range when checked in DLB	This is the signal from switch SW3, indicating the transfer case position.
Transfer_Case_Driveline_Engaged_High	1602-F9	Transfer case is in high range when checked in DLB	This is the signal from switch SW4, indicating the transfer case position.

Switch Locations

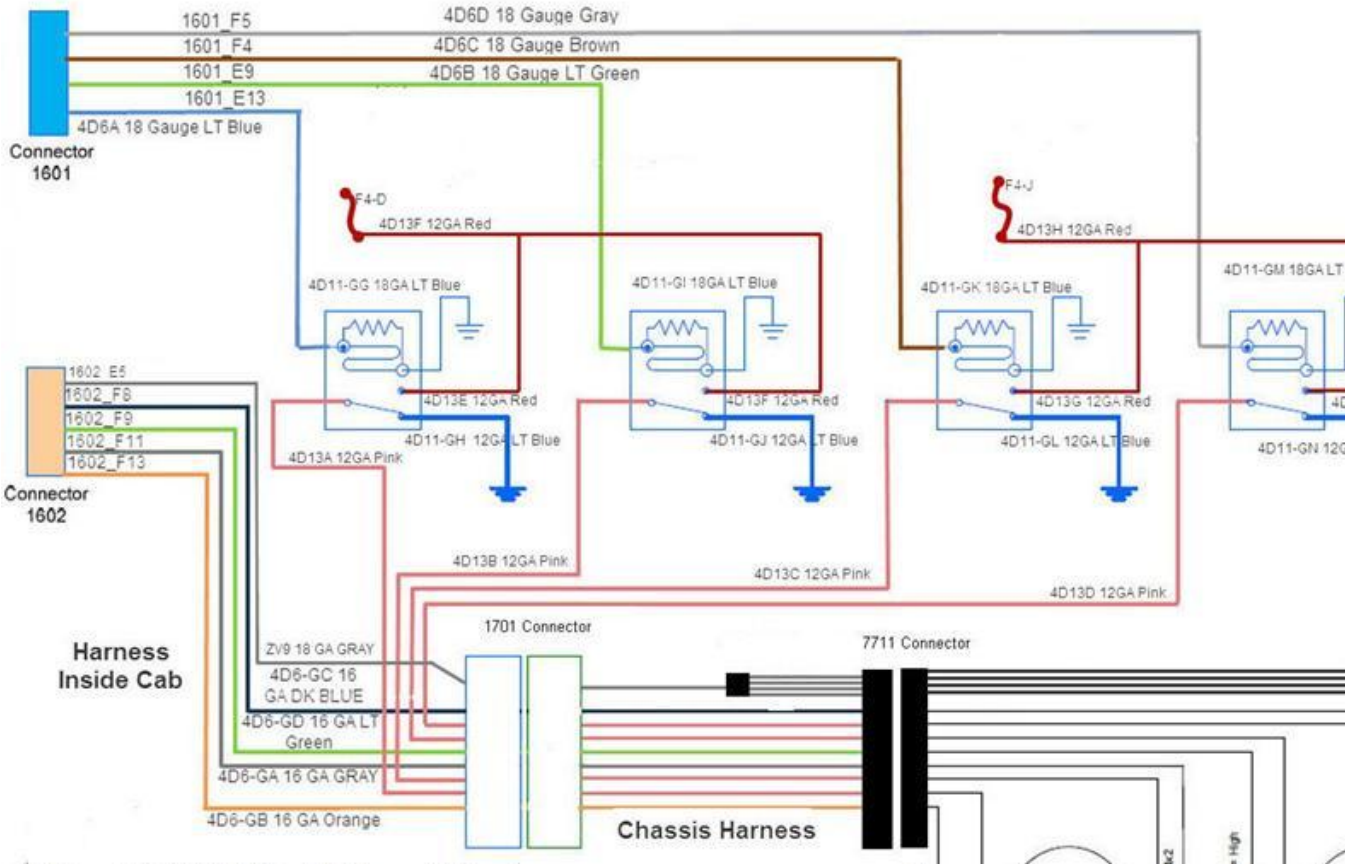


Troubleshooting

When the transfer case is any range, the switch that corresponds with that location will be closed, completing the feedback circuit to the body controller. The high and low range switches should never both be closed at the same time. The front axle engaged and front axle disengaged switches should never both be closed at the same time either.

The first step to diagnosing the system is to understand which range the transfer case currently is in. There are two ways to figure this out. The first way is to place the vehicle in neutral with the engine off and wheels chocked, and comparing the input and output rotations of each shafts are they are being turned by hand in comparison to each other. The second is to drive the vehicle and see it the speedometer is accurate, and if the vehicle is capable of reaching highway speeds. The transfer case low range is a 2.2:1 underdrive. This means that when the transfer case is in low range, for every 2.2 turns of the output shaft from the transmission to the transfer case, the driveshafts that connect to the axles turn one time. Once the transfer case range is understood, this should be compared to the reading of the feedback switches in DLB with the key on. The table above gives signal descriptions for each range. If the feedback signals do not match the current position of the transfer case, the body controller will not send a signal for the transfer case to shift.

Circuit Diagram



Wire Number Inside Cab	Connector 1701 Terminal	Chassis Harness Wire Number	Chassis Harness Wire description	7711 Terminal Number
4D6-GA	45	NX6A	16 Gauge Gray	1
4D6-GB	46	NX6B	16 Gauge Gray	5
4D6-GC	47	NX6C	16 Gauge Gray	9
4D6-GD	48	NX6D	16 Gauge Gray	14
4D13A	65	NX42(+)	12 Gauge Gray	3
4D13B	66	NX42(-)	12 Gauge Gray	8
4D13C	67	NX93(+)	12 Gauge Gray	7
4D13D	68	NX93(-)	12 Gauge Gray	12
ZV9	13	NX9GA	16 Gauge Gray	2
		NX9GB	16 Gauge Red	6
		NX9GC	16 Ga. Orange	10
		NX9GD	16 Gauge Gray	13

Transfer Case Information

The parts and service manual for the FABCO TC-28 transfer case can be obtained by clicking HERE.

Hide Details

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