

2008 TRANSMISSIONS

Automatic Transaxle/Transmission External Controls - Mustang

SPECIFICATIONS

TORQUE SPECIFICATIONS

Description	Nm	lb-ft	lb-in
Selector lever cable bracket bolts	28	20	-
Selector lever housing assembly screws and nuts	9	-	80
Selector lever knob screw	3	-	27

DESCRIPTION AND OPERATION

EXTERNAL CONTROLS

The indicated position of the transmission floor mounted selector lever is transferred to the transmission through the cable and down to the manual control lever on the transmission.

Brake Shift Interlock System

The brake shift interlock mechanism is used on vehicles equipped with an automatic transmission. This system is used to prevent shifting from PARK unless the brake pedal is depressed. The brake shift interlock system consists of an actuator attached to the key interlock assembly and necessary wiring. The brake shift interlock actuator (BSIA) is de-energized, locking the floor mounted selector lever in the PARK position. When the brake pedal is depressed, the BSIA is reactivated and the floor mounted selector lever can be moved out of the PARK position.

Transmission Control (TC) Switch

The transmission control (TC) switch is a momentary contact switch that is located on the floor mounted selector lever. Pushing the TC switch will either disengage or engage the overdrive function of the automatic transmission. If OVERDRIVE is disengaged, the word O/D OFF will illuminate on the instrument cluster.

DIAGNOSTIC TESTS

EXTERNAL CONTROLS

Special Tools

Illustration	Tool Name	Tool Number
	73 Digital Multimeter	105-R0051 or equivalent

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ST1137-A

Inspection and Verification

1. Verify the customer concern by operating the transmission external control.
2. Visually inspect for obvious signs of mechanical and electrical damage; refer to the following chart:

VISUAL INSPECTION CHART

Mechanical	Electrical
• Shift control linkage binding • Brake shift interlock actuator • Selector lever cable	• Circuitry • Bussed electrical center (BEC) fuse(s): ◦ F39 (15A) ◦ F59 (30A) • Smart junction box (SJB) • Wiring harness • Loose or corroded connections • LED

3. If the concern is not visually evident, determine the symptom. Go to **Symptom Chart - External Controls** or Go to **Noise, Vibration and Harshness (NVH)**.

DTC Chart

DTC CHART

DTC	Component	Description	Condition	Symptom	Action
B2572	Brake Shift Interlock	Brake Shift Interlock Output Circuit Failure	The associated circuitry connected to the smart junction box (SJB) or fuse, or the SJB itself may have an issue causing a brake shift interlock concern.	Brake shift interlock is inoperative or does not operate correctly.	Go to Pinpoint Test A .

Symptom Chart - External Controls

Symptom Chart - External Controls

Condition	Possible Sources	Action
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The brake shift interlock system does not release/lock correctly	- Circuitry - Bussed electrical center (BEC) fuse F59 (30A) - Shift interlock actuator - Smart junction box (SJB)	Go to <u>Pinpoint Test A.</u>
The selector lever is out of correct gear relationship	- Transmission selector lever cable and bracket - Retainer bracket - Shift control linkage out of adjustment	Go to <u>Pinpoint Test B.</u>
- Transmission range indicator does not correspond to the gear - The transmission control (TC) switch is inoperative	- Transmission selector lever cable bracket - Selector lever linkage - BEC fuse F39 (15A) - TC switch - TC switch not cycled during self-test - PCM - Circuitry	- TIGHTEN the bolts holding the transmission selector lever cable bracket. - VERIFY digital transmission range (TR) sensor range for correct adjustment. REFER to <u>AUTOMATIC TRANSAXLE/TRANSMISSION - 5R55S</u> article. - Go to <u>Pinpoint Test C.</u>
The transmission control indicator lamp (TCIL) is not operating correctly	- LED - Instrument cluster - PCM	REFER to <u>INSTRUMENT CLUSTER (IC), MESSAGE CENTER, AND WARNING CHIMES</u> article.
- Excessive shift effort - Transmission	- Transmission selector lever cable - Cable bracket - Transmission	- INSTALL a new transmission selector lever cable. - ADJUST the cable. TIGHTEN the screws. - INSTALL a new transmission selector lever

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selector lever will not shift	selector lever cable • Broken transmission selector level cable	cable. • INSTALL a new transmission selector lever cable.
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Symptom Chart - Noise, Vibration and Harshness (NVH)

NOTE: Noise, vibration and harshness (NVH) symptoms should be identified using the diagnostic tools that are available. For a list of these tools, an explanation of their uses and a glossary of common terms, refer to **NOISE, VIBRATION AND HARSHNESS** article. Since it is possible any one of multiple systems may be the cause of a symptom, it may be necessary to use a process of elimination type of diagnostic approach to pinpoint the responsible system. If this is not the causal system for the symptom, refer back to **NOISE, VIBRATION AND HARSHNESS** article for the next likely system and continue diagnosis.

Symptom Chart - Noise, Vibration and Harshness (NVH)

Condition	Possible Sources	Action
• Vibration - a high frequency (20-80 Hz) that is felt through the seat or selector lever. Changes with engine speed	• Selector lever cable incorrectly routed, grounded out or loose	• CHECK the selector lever cable. REPAIR as necessary. REFER to <u>Selector Lever Cable and Bracket</u>.
• Rattle, noise, buzz or other noise	• Transmission selector lever loose • Transmission selector lever	• TIGHTEN the selector lever bolt. • INSTALL a new transmission selector lever. REFER to <u>Selector Lever</u>.

Pinpoint Tests

Refer to appropriate SYSTEM WIRING DIAGRAM ARTICLE, Shift Lock for schematic and connector information. Refer to appropriate SYSTEM WIRING DIAGRAM ARTICLE, Transmission Control for schematic and connector information.

PINPOINT TEST A: THE SHIFT INTERLOCK SYSTEM DOES NOT RELEASE/LOCK CORRECTLY

A1 TEST THE BRAKE LIGHTS

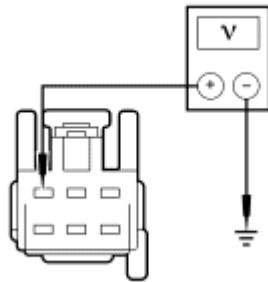
- Key in ON position.
- Apply the brake pedal and observe the stoplamp.
- **Do the stoplamp illuminate?**

YES : Go to A2.

NO : REFER to **EXTERIOR LIGHTING** article.

A2 CHECK CIRCUIT 1040 (RD/BK) FOR AN OPEN

- Disconnect: Selector Lever C307



N0050538

Fig. 1: Measuring Voltage Between Selector Lever C307-3, Circuit 1040 (RD/BK), Harness Side & Ground

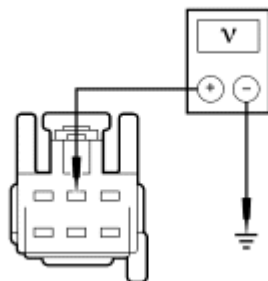
Courtesy of FORD MOTOR CO.

- Measure the voltage between selector lever C307-3, circuit 1040 (RD/BK), harness side, and ground while depressing and releasing the brake pedal.
- **Is the voltage greater than 10 volts with the brake pedal depressed and 0 volt with the brake pedal released?**

YES : Go to A3.

NO : REPAIR the circuit. TEST the system for normal operation.

A3 CHECK CIRCUIT 664 (YE/LG) FOR AN OPEN



N0050539

Fig. 2: Measuring Voltage Between Selector Lever C307-2, Circuit 664 (YE/LG), Harness Side & Ground

Courtesy of FORD MOTOR CO.

- Measure the voltage between selector lever C307-2, circuit 664 (YE/LG), harness side, and ground.
- **Is the voltage greater than 10 volts?**

YES : Go to A4.

NO : REPAIR the circuit. TEST the system for normal operation.

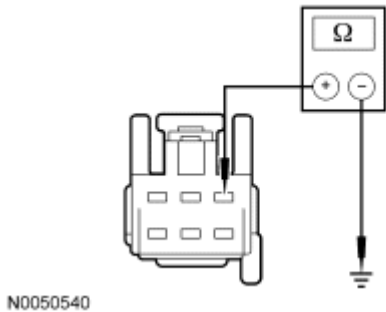
A4 TEST CIRCUIT 1205 (BK) FOR AN OPEN

Fig. 3: Measuring Resistance Between Selector Lever C307-1, Circuit 1205 (BK), Harness Side & Ground

Courtesy of FORD MOTOR CO.

- Measure the resistance between selector lever C307-1, circuit 1205 (BK), harness side, and ground.
- **Is the resistance less than 5 ohms?**

YES : INSTALL a new selector lever assembly. REFER to **Selector Lever**. TEST the system for normal operation.

NO : REPAIR the circuit. TEST the system for normal operation.

PINPOINT TEST B: THE SHIFT CONTROL IS OUT OF CORRECT GEAR RELATIONSHIP**B1 CHECK THE SHIFT CONTROL LINKAGE**

- Key in ON position.
- Apply the brake pedal.
- Actuate the transmission selector lever in all ranges.
- Observe the shift control linkage during operation.
- **Is the shift control linkage OK?**

YES : Go to B2.

NO : REPAIR as necessary. TEST the system for normal operation.

B2 CHECK THE TRANSMISSION SELECTOR LEVER CABLE

- Check the transmission selector lever cable and bracket installation and tightness.
- **Is the transmission selector lever cable correctly installed and adjusted?**

YES : Go to B3.

NO : REPAIR as necessary. TEST the system for normal operation.

B3 CHECK THE LINKAGE/CABLE FOR CORRECT GEAR RELATIONSHIP

- Apply the brake pedal.
- Actuate the transmission selector lever in all ranges.
- **Does the indicator match the gear selection?**

YES : VERIFY the correct adjustment of the digital transmission range (TR) sensor. REFER to

AUTOMATIC TRANSAXLE/TRANSMISSION - 5R55S article. ADJUST the digital TR sensor if necessary. TEST the system for normal operation.

NO : ADJUST the transmission selector lever cable. REFER to **Selector Lever Cable Adjustment**. TEST the system for normal operation.

PINPOINT TEST C: THE TRANSMISSION CONTROL (TC) SWITCH IS INOPERATIVE

C1 CHECK THE VOLTAGE TO THE TRANSMISSION CONTROL (TC) SWITCH

- Key in OFF position.
- Disconnect: Selector Lever C307
- Key in ON position.

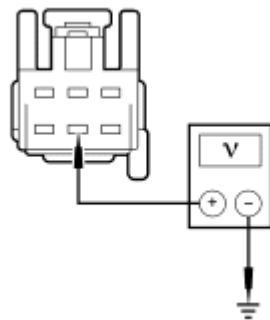


Fig. 4: Measuring Voltage Between Selector Lever C307-5, Circuit 1862 (VT/WH), Harness Side & Ground

Courtesy of FORD MOTOR CO.

- Measure the voltage between selector lever C307-5, circuit 1862 (VT/WH), harness side, and ground.

- **Is the voltage greater than 10 volts?**

YES : Go to C2.

NO : REPAIR the circuit. TEST the system for normal operation.

C2 CHECK THE TC SWITCH

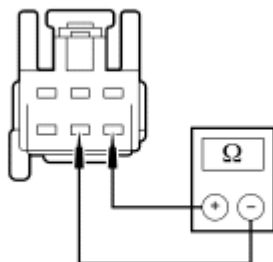


Fig. 5: Measuring Resistance Between Selector Lever C307-5 & C307-6, Component Side
Courtesy of FORD MOTOR CO.

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- Measure the resistance between selector lever C307-5 and C307-6, component side, while depressing and releasing the TC switch.
- **Is the resistance less than 5 ohms with the TC switch depressed and greater than 10,000 ohms with the TC switch released?**

YES : Go to C3.

NO : INSTALL a new selector lever knob. TEST the system for normal operation.

C3 CHECK CIRCUIT 224 (TN/WH) FOR AN OPEN

- Key in OFF position.
- Disconnect: PCM C175B

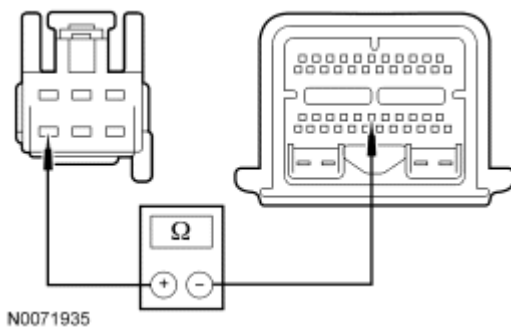


Fig. 6: Checking Circuit 224 (TN/WH) For An Open
Courtesy of FORD MOTOR CO.

- Measure the resistance between selector lever C307-6, circuit 224 (TN/WH), harness side and PCM C175B-29, circuit 224 (TN/WH), harness side.

- **Is the resistance less than 5 ohms?**

YES : Go to C4.

NO : REPAIR the circuit. TEST the system for normal operation.

C4 CHECK CIRCUIT 224 (TN/WH) FOR A SHORT TO GROUND

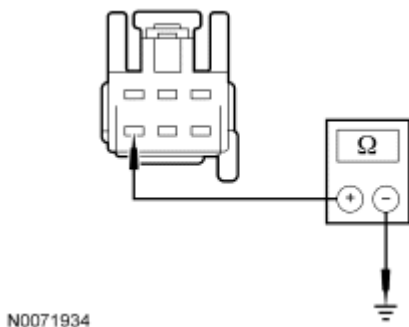


Fig. 7: Checking Circuit 224 (TN/WH) For A Short To Ground
Courtesy of FORD MOTOR CO.

- Measure the resistance between selector lever C307-6, circuit 224 (TN/WH), harness side and

ground.

- **Is the resistance greater than 10,000 ohms?**

YES : INSTALL a new PCM. REFER to **ELECTRONIC ENGINE CONTROLS** article. TEST the system for normal operation.

NO : REPAIR the circuit. TEST the system for normal operation.

GENERAL PROCEDURES

BRAKE SHIFT INTERLOCK OVERRIDE

NOTE: If it is necessary to use the override procedure to move the gearshift lever out of the PARK position, it is possible that a fuse has blown and the brake lights are not operational. Before driving the vehicle, verify that the brake lights are working.

This vehicle is equipped with a brake shift interlock feature that prevents the gearshift lever from being moved out of PARK when the ignition is in the ON position unless the brake pedal is depressed.

If the gearshift lever cannot be moved out of the PARK position when the ignition is in the ON position and the brake pedal is depressed:

1. Apply the parking brake and remove the ignition key.
2. Remove the access panel.

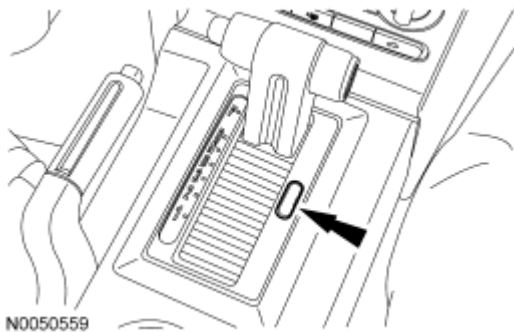


Fig. 8: Locating Access Panel
Courtesy of FORD MOTOR CO.

3. Using a suitable tool, depress the brake shift interlock override mechanism on the selector lever, apply the brake, depress the button on the selector lever and move the selector lever into NEUTRAL.

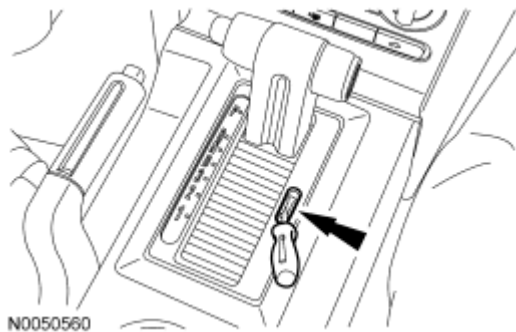


Fig. 9: Removing Brake Shift Interlock Using A Suitable Tool
Courtesy of FORD MOTOR CO.

4. Start the vehicle.
5. To install, reverse the procedure.

SELECTOR LEVER CABLE ADJUSTMENT

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** article.
2. Place the selector lever in the D position.
3. Lift the lock upward on the transmission selector cable lock and remove the cable from the selector lever.

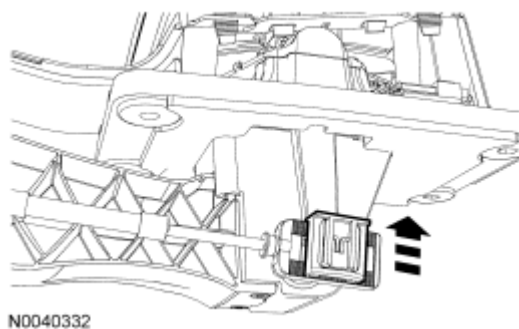


Fig. 10: Removing Selector Lever Cable From Selector Lever
Courtesy of FORD MOTOR CO.

4. Place the transmission manual control lever in the D position by rotating the manual lever clockwise to the extent of travel, then rotate counterclockwise 3 detents.
5. Install the transmission selector lever cable on the selector lever and push the lock downward to lock the selector lever cable adjustment lock.

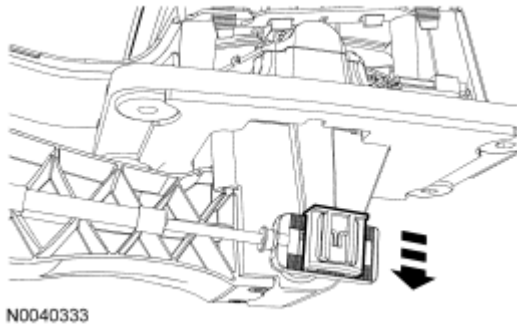


Fig. 11: Locking Selector Lever Cable Adjustment Lock
Courtesy of FORD MOTOR CO.

REMOVAL AND INSTALLATION

BRAKE SHIFT INTERLOCK ACTUATOR

NOTE: The brake shift interlock actuator is not serviced separately. If a new brake shift interlock actuator is required, install a new transmission selector lever assembly. See Selector Lever.

SELECTOR LEVER CABLE AND BRACKET

REMOVAL

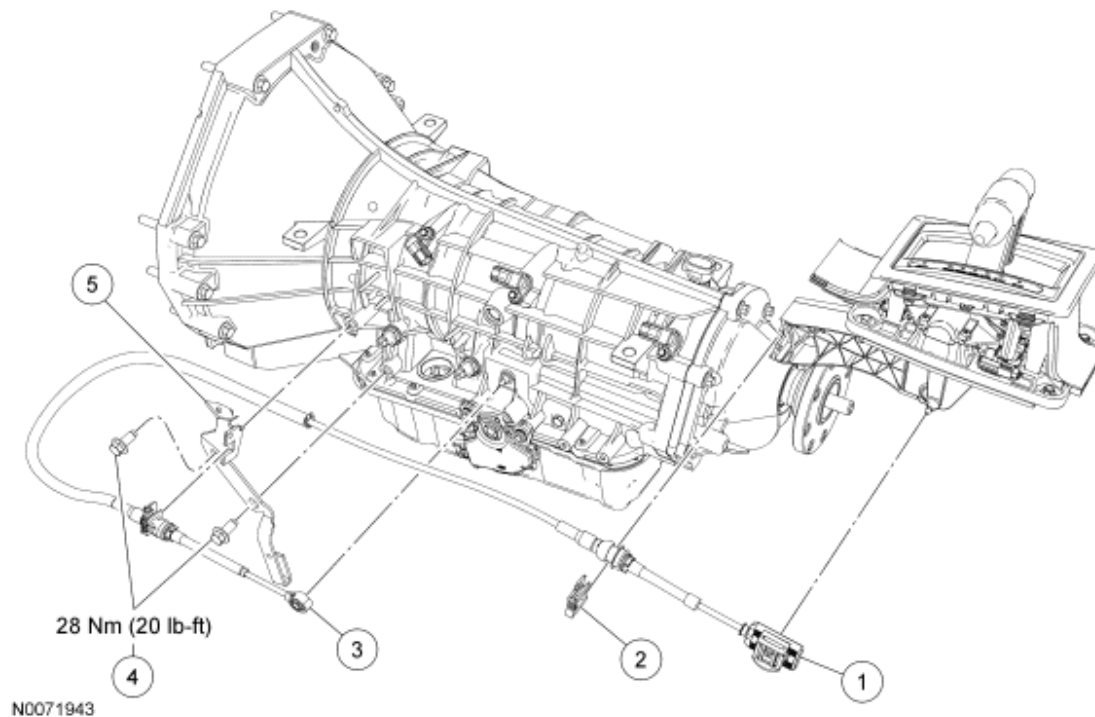


Fig. 12: Exploded View Of Selector Lever Cable & Bracket With Torque Specification

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Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7E395	Transmission selector lever cable
2	7H181	Transmission selector lever cable retaining clip
3	7E395	Transmission selector lever cable
4	N605918-S439	Transmission selector lever cable bracket bolts
5	7B229	Transmission selector lever cable bracket

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** article.
2. Remove the selector lever cable from the selector lever.

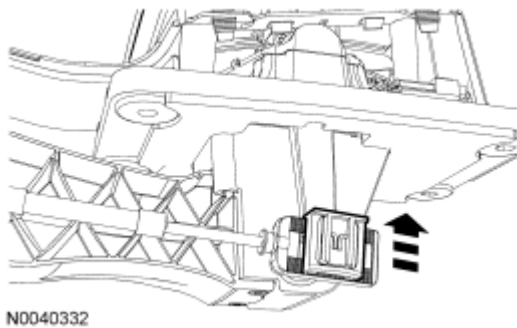


Fig. 13: Removing Selector Lever Cable From Selector Lever
Courtesy of FORD MOTOR CO.

3. Remove the selector lever cable from the bracket and discard the clip.

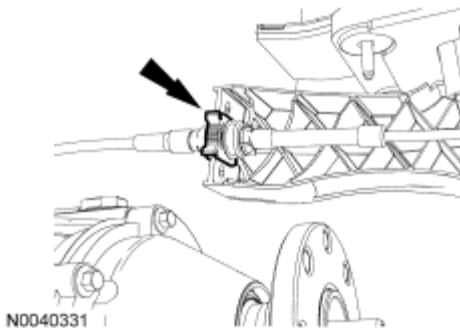


Fig. 14: Locating Selector Lever Cable From Bracket And Discard Clip
Courtesy of FORD MOTOR CO.

4. Remove the selector lever cable from the transmission manual lever.

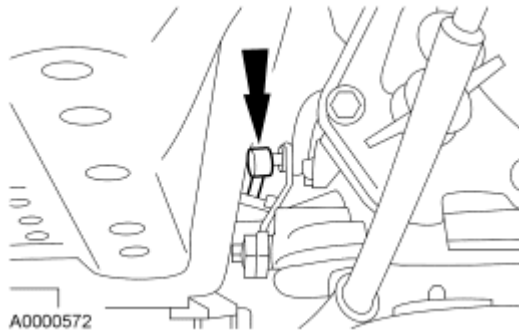


Fig. 15: Locating Shift Cable Eyelet At Manual Control Lever
Courtesy of FORD MOTOR CO.

5. Remove the 2 transmission selector lever cable bracket bolts from the transmission and remove the bracket.

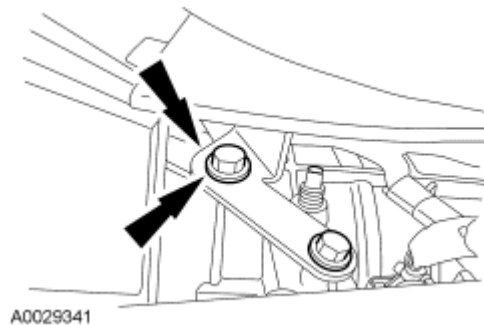


Fig. 16: Locating Transmission Shift Cable Bracket Bolts
Courtesy of FORD MOTOR CO.

INSTALLATION

1. Install the selector lever cable bracket and install the 2 bolts.
 - Tighten to 28 Nm (20 lb-ft).

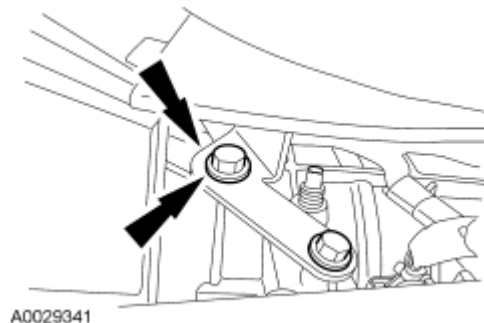


Fig. 17: Locating Transmission Shift Cable Bracket Bolts
Courtesy of FORD MOTOR CO.

2. Install the selector lever cable eyelet onto the transmission manual lever.

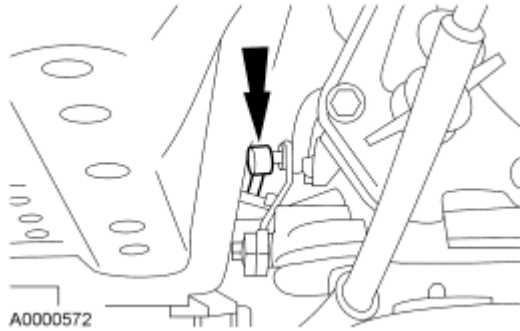


Fig. 18: Locating Shift Cable Eyelet At Manual Control Lever
Courtesy of FORD MOTOR CO.

NOTE: It is necessary to install a new plastic clip prior to installation.

3. Install the selector lever cable into the selector lever cable bracket.

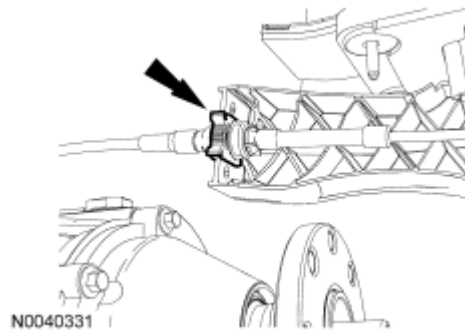


Fig. 19: Locating Selector Lever Cable From Bracket And Discard Clip
Courtesy of FORD MOTOR CO.

4. Install the selector lever cable onto the selector lever and lock the selector lever cable adjustment lock.

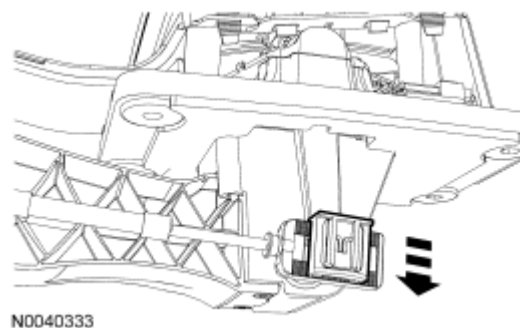


Fig. 20: Locking Selector Lever Cable Adjustment Lock
Courtesy of FORD MOTOR CO.

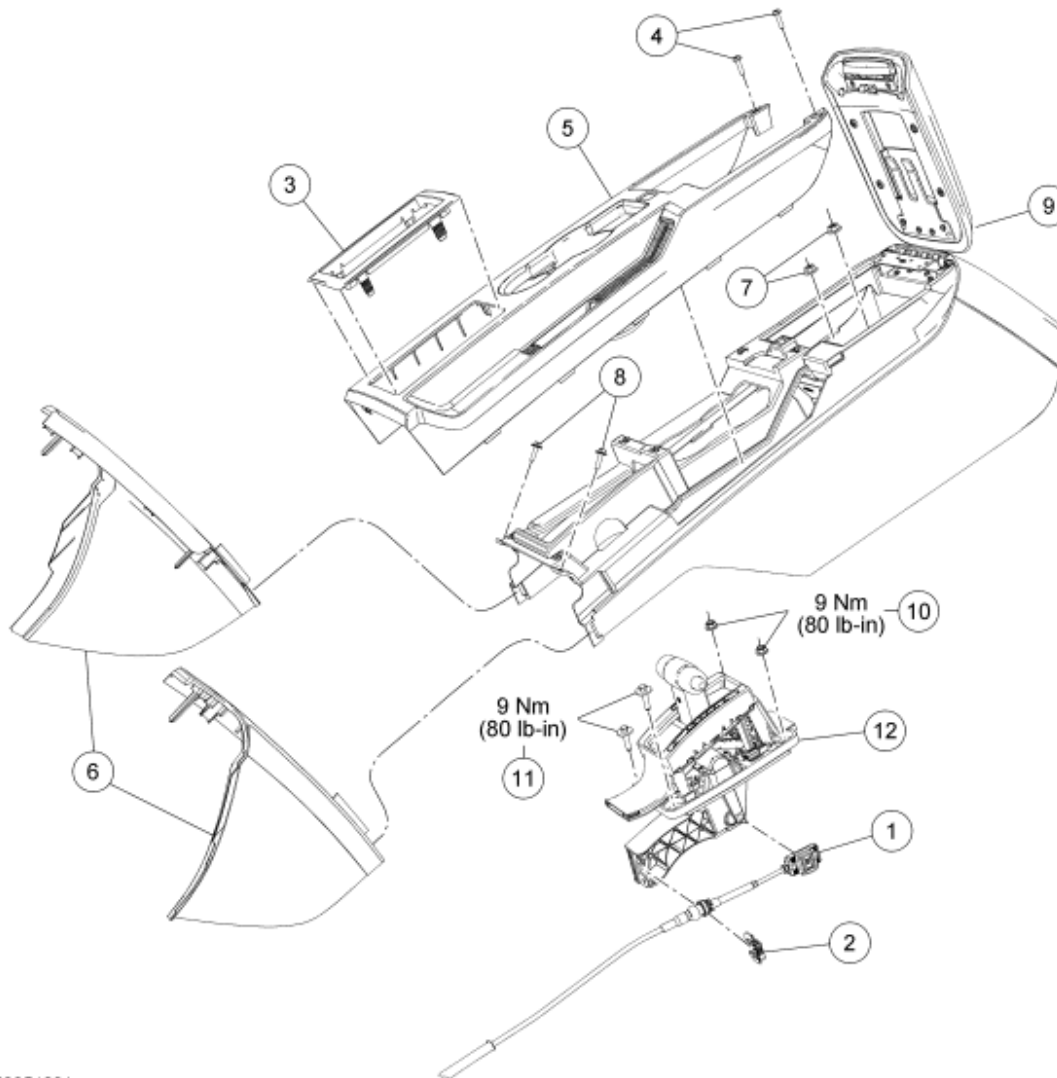
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5. Verify the selector lever cable is adjusted correctly. For additional information, refer to **Selector Lever Cable Adjustment**.

SELECTOR LEVER

REMOVAL



N0051231

Fig. 21: Exploded View Of Selector Lever With Torque Specifications
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	7E395	Transmission selector lever cable
2	7H181	Transmission selector lever cable retaining clip
3	-	Selector lever trim

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4	-	Center console finish panel screws
5	-	Center console finish panel
6	-	Center stack kick panels
7	-	Center console nuts
8	-	Center console screws
9	-	Center console
10	N800942-S301A	Transmission selector lever housing assembly nuts
11	N800947-S301A	Transmission selector lever housing assembly screws
12	7210	Transmission selector lever

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** article.
2. Remove the selector lever cable from the selector lever.

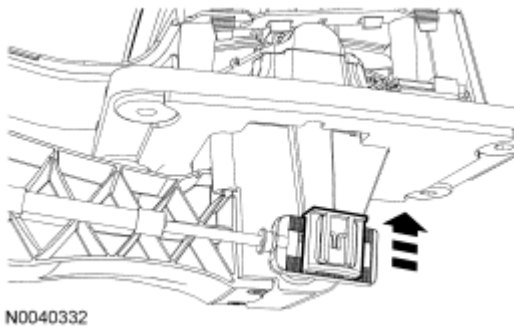


Fig. 22: Removing Selector Lever Cable From Selector Lever
Courtesy of FORD MOTOR CO.

3. Remove the selector lever cable from the bracket and discard the clip.

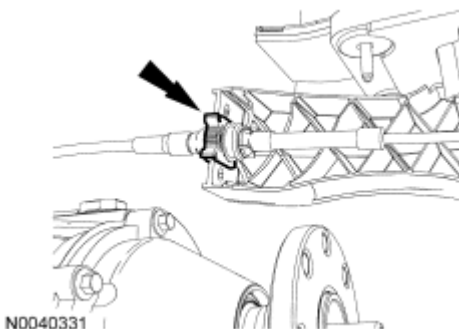


Fig. 23: Locating Selector Lever Cable From Bracket And Discard Clip
Courtesy of FORD MOTOR CO.

4. Remove the center console selector lever trim.

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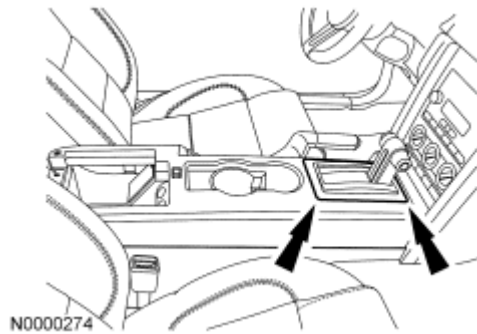


Fig. 24: Locating Console Shifter Bezel
Courtesy of FORD MOTOR CO.

5. Remove the 2 screws and the center console top finish panel.

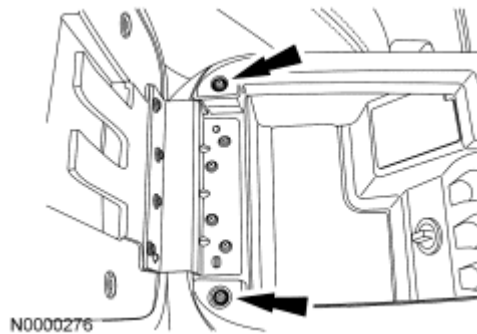


Fig. 25: Locating Center Console Top Finish Panel Screws
Courtesy of FORD MOTOR CO.

NOTE: Passenger side center console kick panel shown, driver side similar.

6. Remove the driver and passenger center console kick panels.

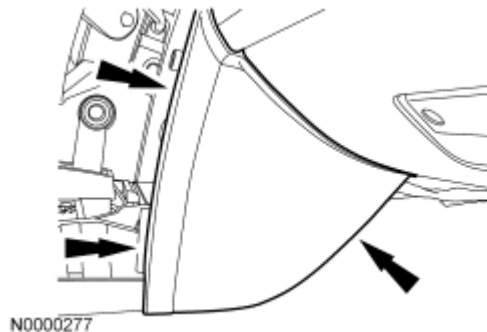


Fig. 26: Locating Driver And Passenger Center Console Kick Panels
Courtesy of FORD MOTOR CO.

7. Remove the 2 screws in the bottom of the console bin.

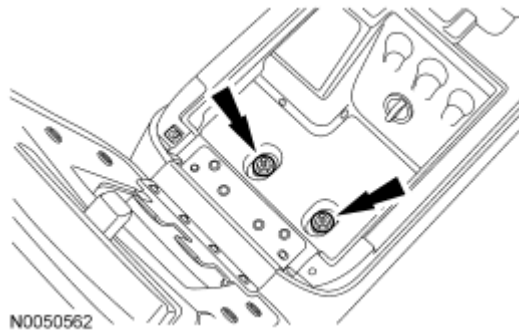


Fig. 27: Locating Screws In Bottom Of Console Bin
Courtesy of FORD MOTOR CO.

8. Remove the 2 screws from the front of the console.

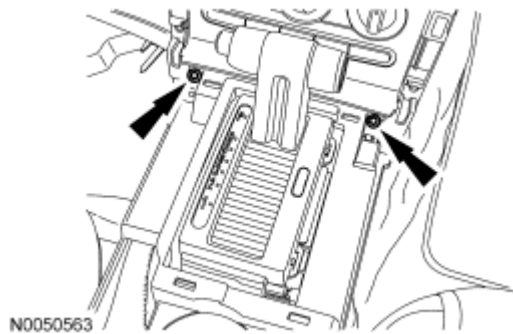


Fig. 28: Locating Screws From Front Of Console
Courtesy of FORD MOTOR CO.

9. Lift up the console, disconnect the power point electrical connector and remove the console.

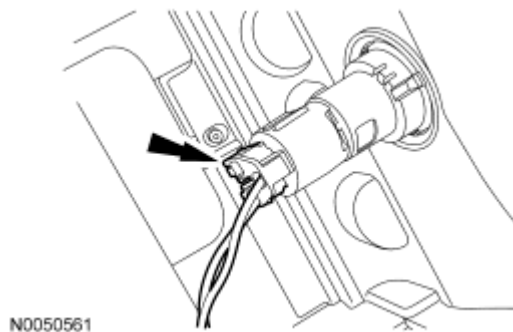


Fig. 29: Locating Power Point Electrical Connector
Courtesy of FORD MOTOR CO.

10. Disconnect the selector lever electrical connector.

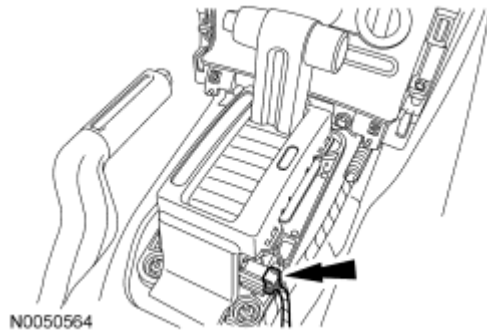


Fig. 30: Locating Selector Lever Electrical Connector
Courtesy of FORD MOTOR CO.

11. Remove the 2 nuts and the 2 screws and carefully lift the transmission selector lever assembly from the vehicle.

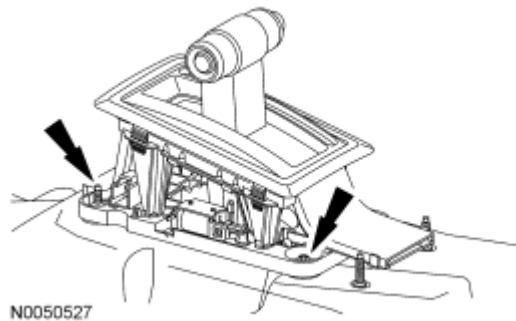


Fig. 31: Locating Transmission Selector Lever Nuts And Screws
Courtesy of FORD MOTOR CO.

INSTALLATION

1. Position the transmission selector lever housing assembly in the vehicle and install the 2 nuts and the 2 screws.
 - Tighten to 9 Nm (80 lb-in).

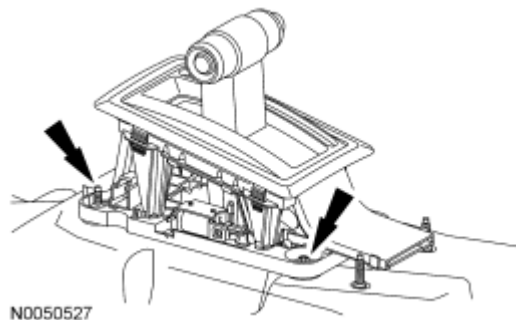


Fig. 32: Locating Transmission Selector Lever Nuts And Screws
Courtesy of FORD MOTOR CO.

2. Connect the selector lever electrical connector.

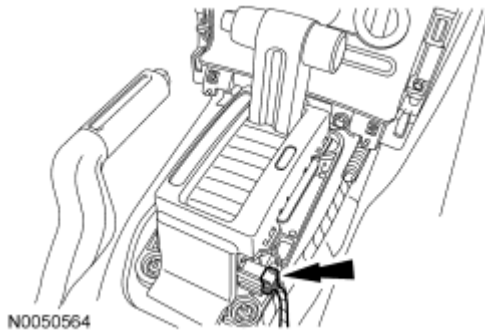


Fig. 33: Locating Selector Lever Electrical Connector
Courtesy of FORD MOTOR CO.

3. Connect the power point electrical connector and install the console.

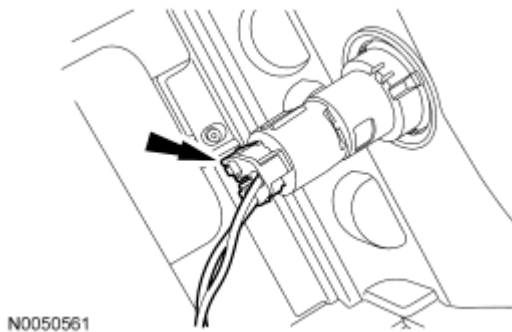


Fig. 34: Locating Power Point Electrical Connector
Courtesy of FORD MOTOR CO.

4. Install the 2 screws into the front of the console.

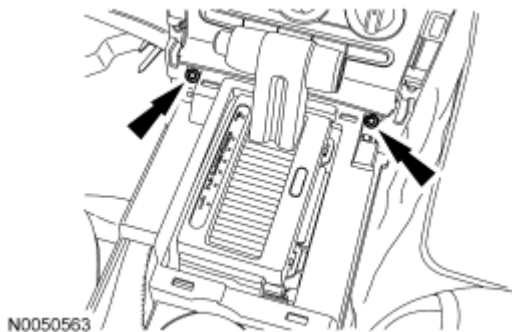


Fig. 35: Locating Screws From Front Of Console
Courtesy of FORD MOTOR CO.

5. Install the 2 screws into the bottom of the console bin.

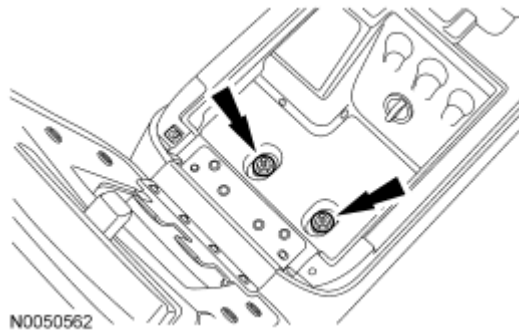


Fig. 36: Locating Screws In Bottom Of Console Bin
Courtesy of FORD MOTOR CO.

6. Install the driver and passenger side center console kick panels.

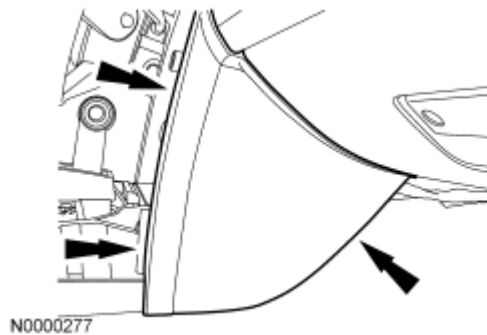


Fig. 37: Locating Driver And Passenger Center Console Kick Panels
Courtesy of FORD MOTOR CO.

7. Install the center console top finish panel and the 2 screws.

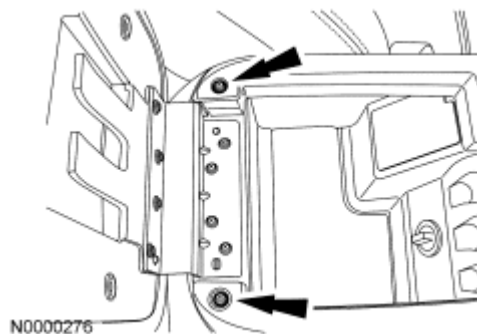


Fig. 38: Locating Center Console Top Finish Panel Screws
Courtesy of FORD MOTOR CO.

8. Install the center console selector lever trim.

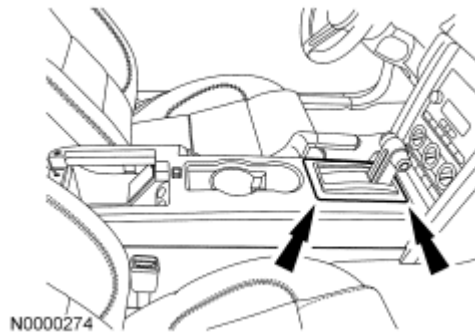


Fig. 39: Locating Console Shifter Bezel
Courtesy of FORD MOTOR CO.

NOTE: It is necessary to install a new plastic clip prior to installation.

9. Install the selector lever cable into the bracket.

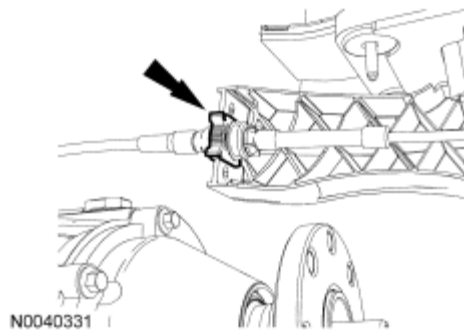


Fig. 40: Locating Selector Lever Cable From Bracket And Discard Clip
Courtesy of FORD MOTOR CO.

10. Install the selector lever cable onto the selector lever and lock the selector lever cable adjustment lock.

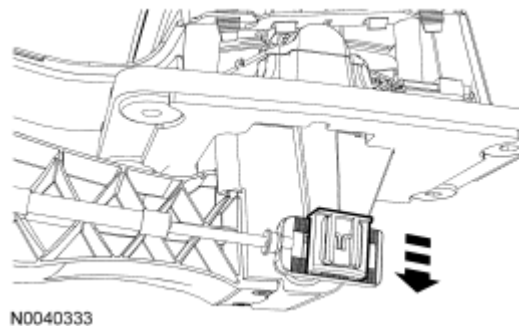
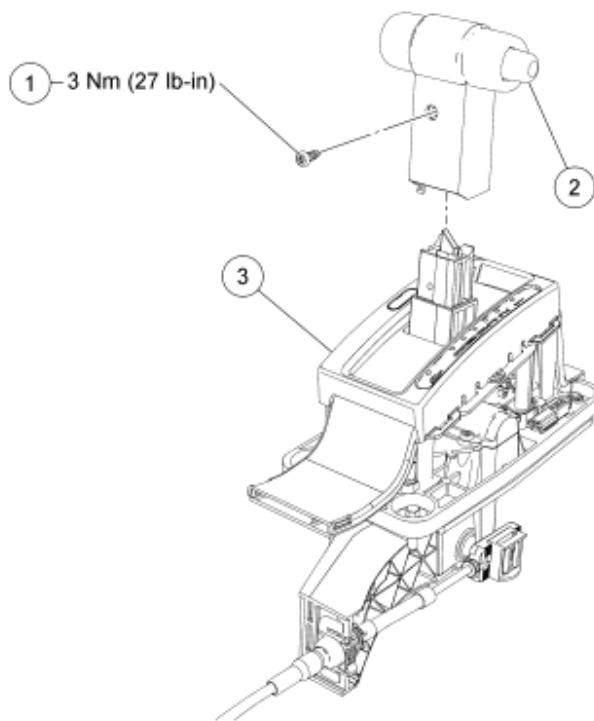


Fig. 41: Locking Selector Lever Cable Adjustment Lock
Courtesy of FORD MOTOR CO.

11. Verify the selector lever cable is adjusted correctly. For additional information, refer to **Selector Lever Cable Adjustment**.

TRANSMISSION CONTROL (TC) SWITCH

NOTE: The transmission control (TC) switch is not serviced separately. If a new TC switch is required, install a new transmission selector knob assembly. See Selector Lever Knob.

SELECTOR LEVER KNOB**REMOVAL**

N0050525

Fig. 42: Exploded View Of Selector Lever Knob With Torque Specification
Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	-	Transmission selector lever knob screw
2	7213	Transmission selector lever knob
3	7210	Transmission selector lever

1. Remove the transmission selector lever assembly. For additional information, refer to Selector Lever.
2. With the selector lever knob pulled to the rear, remove the screw from the knob base.

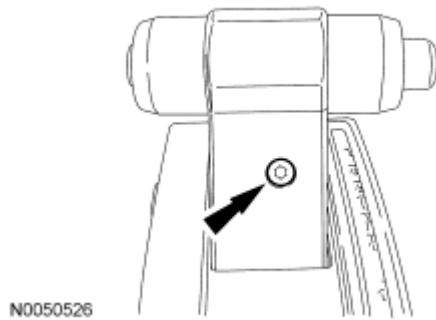


Fig. 43: Locating Screw From Knob Base
Courtesy of FORD MOTOR CO.

3. Slide the knob up and off the selector shaft. Disconnect the transmission control (TC) switch electrical connector.

INSTALLATION

1. Connect the TC switch electrical connector.
2. Fold the TC switch wire into the selector shaft channel to keep the harness from contacting the sliding mechanisms.

CAUTION: Tightening the screw over 3 Nm (27 lb-in) may damage the selector lever assembly.

3. Align the selector lever knob base screw hole with the selector shaft and install the screw.
 - Tighten to 3 Nm (27 lb-in).

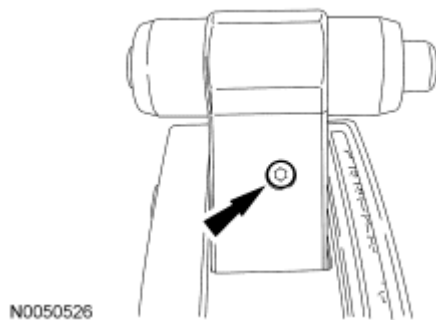


Fig. 44: Locating Screw From Knob Base
Courtesy of FORD MOTOR CO.

4. Install the transmission selector lever assembly in the vehicle. For additional information, refer to **Selector Lever**.