211-00 Steering System - General Information *2019 Ranger*
Diagnosis and Testing *Procedure revision date: 12/1/2016*

Steering System

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
− Tire pressure(s) − Accessory drive belt − Loose tie-rod end(s) − Tie-rod(s) − Steering gear housing − Loose strut and spring assemblies or ball joints − Loose pinch bolts on steering column shaft flexible coupling − Wheels and tires − Power steering lines fluid leaks − Steering gear bellows	− Power steering pressure (PSP) switch

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart.

Symptom Chart

The following table provides all the possible symptoms and sources related to the Steering System. For the actual diagnosis, proceed to use the Ford diagnostic equipment.

Symptom Chart	**Possible Sources**
Drift left or right	Wheels and tires
	Vehicle attitude incorrect (front or rear is high or low)
	Incorrect wheel alignment
	Damaged or worn front wheel bearing(s)
	Brake system
	Steering linkage
	Steering gear
Steering wheel off center	Vehicle attitude incorrect (front or rear is high or low)
	Incorrect wheel alignment
	Suspension lower arm ball joint

	Steering linkage / Steering gear
Vibration	Wheels and tires
	Damaged or worn front wheel bearing(s)
	Front strut and spring assemblies
	Damaged front suspension lower arm(s)
	Steering linkage
	Incorrect wheel alignment
Steering effort is high/low	Power steering hose restriction
	Power steering fluid contamination
	Aeration of the power steering fluid
	Steering gear floor seal touch condition
	Steering column
	Steering linkage
	Steering gear
	Worn power steering pump
Excessive noise	Power steering operation noise
	Aeration of the power steering fluid
	Power steering lines
	Loose steering gear retaining bolts
	Power steering pump
	Tie-rod
Steering does not vary with increased wheel rotation	Worn tie-rod ends
	Worn front suspension bushings
	Suspension lower arm ball joint
	Steering gear insulator bushings worn or perished
	Loose steering gear retaining bolts
	Loose steering column retaining bolts
	Loose steering column to steering gear pinion retaining bolt
	Excessive steering gear backlash

Components Tests

Steering Linkage

1. Grasp the steering wheel firmly and move it up and down and to the left and right without turning the steering wheel to check the steering column bearing for wear, steering column shaft for wear, steering wheel for looseness and steering column for looseness. If the steering column bearing or the steering column shaft is worn install a new steering column shaft.
   REFER to: Steering Column (211-04 Steering Column, Removal and Installation).
   If the steering wheel or the steering column is loose, tighten the steering wheel or the steering column retaining bolts.

2. With the road wheels in the straight ahead position, gently turn the steering wheel to the left and the right to check for free play in the steering linkage.

3. There should be no excessive free play at the steering wheel rim. If there is excessive free play, CHECK the tie-rod inner and outer ball joints, REFER to Tie-Rod Component Test in this procedure. CHECK the steering column universal joint, REFER to Steering Column Universal Joint Component Test in this procedure. If there is no free play in the tie-rod and the steering column, install a new steering gear.
REFER to: Steering Gear - RWD (211-02 Power Steering, Removal and Installation).

Tie-Rod

1. Noises such as knocks, which may appear to originate from the steering linkage, may also be generated by front suspension components.
REFER to: Noise, Vibration and Harshness (NVH) (100-04 Noise, Vibration and Harshness, Diagnosis and Testing).

2. Raise and support the vehicle.
REFER to: Jacking and Lifting (100-02 Jacking and Lifting, Description and Operation).
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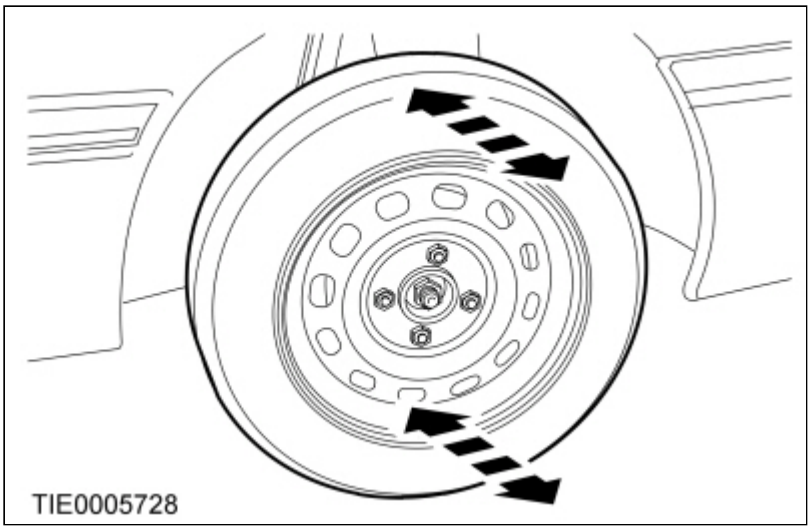
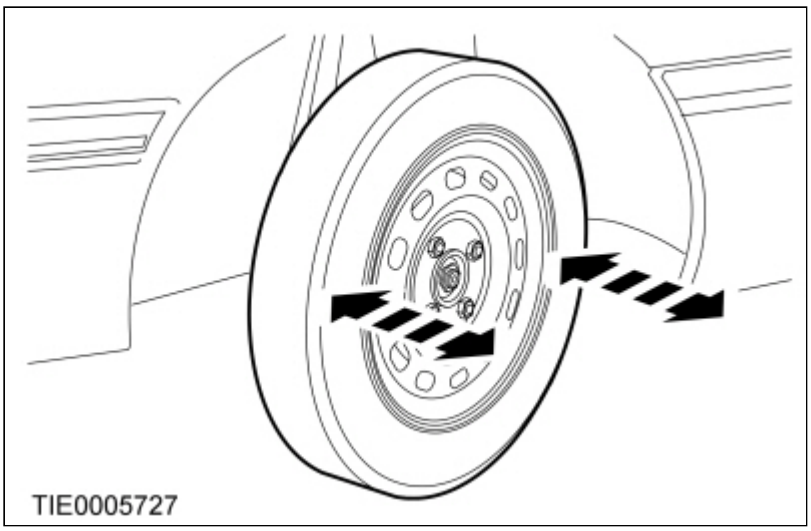
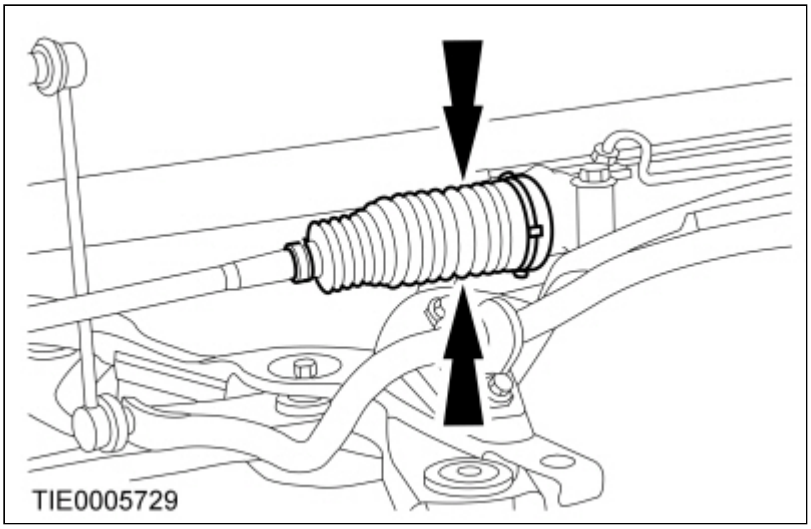


3. Firmly grasp the road wheel and apply a rocking motion checking for any free play in the wheel bearing or suspension components.

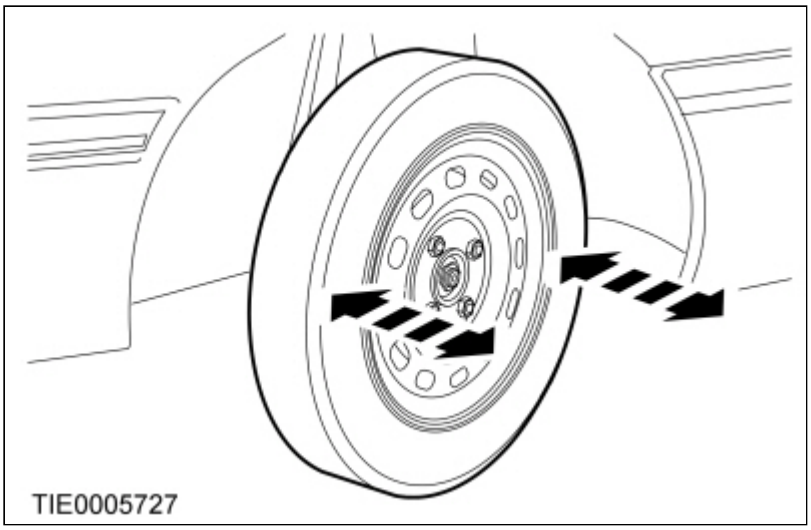
4. Turn the steering wheel to position the steering linkage against the right-hand steering lock stop.



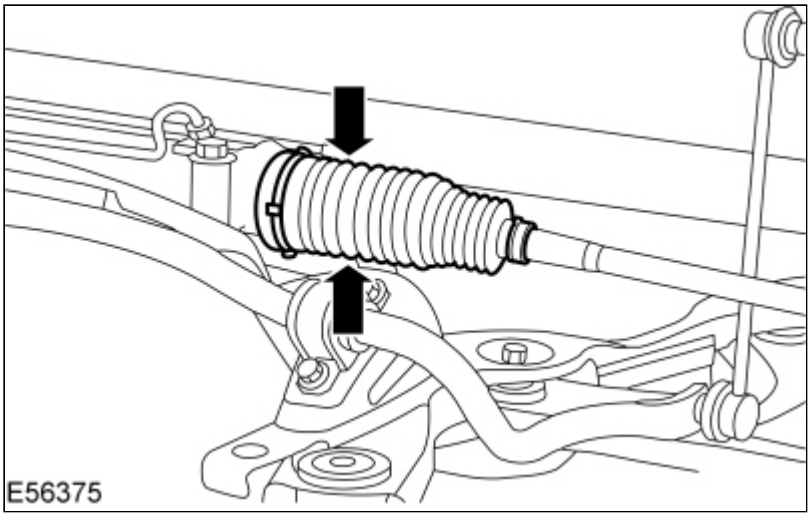
5. With the aid of another technician holding the steering linkage against the right-hand steering lock stop, firmly grasp the right-hand road wheel and apply a rocking motion checking for any free play in the steering linkage.



6. Detach the steering gear boot from the steering gear body and check for free play at the tie-rod inner ball joint.
7. If there is free play at the tie-rod inner ball joint, install a new tie-rod.
   REFER to: Tie Rod (211-03 Steering Linkage) .
8. Check the tie-rod end for free play. Install a new tie-rod end if necessary.
   REFER to: Tie Rod End (211-03 Steering Linkage) .
9. Attach the steering gear boot to the steering gear body. Install new steering gear boot clamps.
10. Turn the steering wheel to position the steering linkage against the left-hand steering lock stop.



11. With the aid of another technician holding the steering against the left-hand steering lock stop, firmly grasp the left-hand road wheel and apply a rocking motion checking for any free play in the steering linkage.



12. Detach the steering gear boot from the steering gear body and check for free play at the tie-rod inner ball joint.

13. If there is free play at the tie-rod inner ball joint, install a new tie-rod.
REFER to: Tie Rod (211-03 Steering Linkage) .

14. Check the tie-rod end for free play. Install a new tie-rod end if necessary.
REFER to: Tie Rod End (211-03 Steering Linkage) .

15. Attach the steering gear boot to the steering gear body. Install new steering gear boot clamps.

Turning Effort Test

1. Before carrying out the turning effort test, make sure that the following are serviceable:

- Suspension components.
- Steering column.
- Toe adjustment.
REFER to: Front Toe Adjustment (204-00 Suspension System - General Information, General Procedures).
- Tire pressures.

2. Park the vehicle on a dry, even surface and apply the parking brake.

3. Remove the driver air bag module.
REFER to: Driver Airbag (501-20B Supplemental Restraint System, Removal and Installation).

4. Connect the air bag simulators to the sub-harnesses in place of the driver air bag module at the top of the steering column.

5. Start the engine and turn the steering wheel from lock to lock several times until the power steering fluid has reached normal operating temperature.

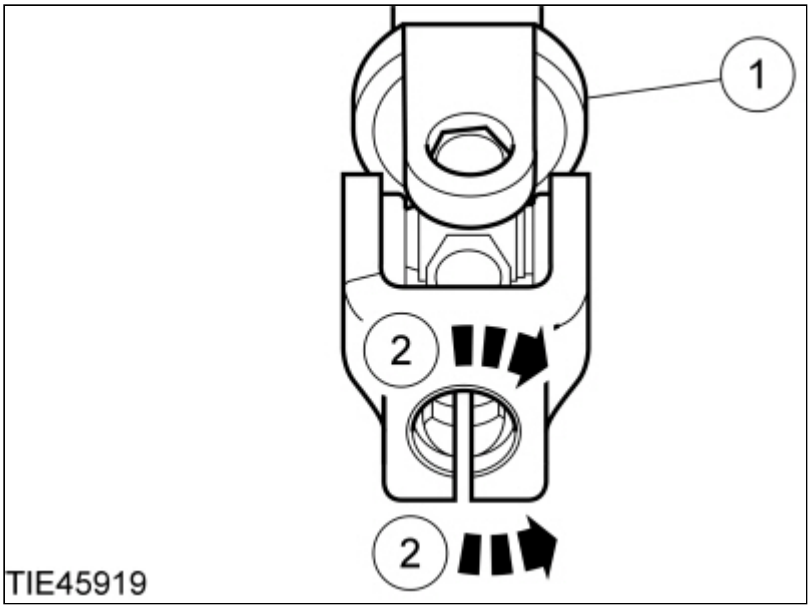
6. Using a suitable torque wrench and socket, check the steering wheel turning effort.

7. If the steering wheel turning effort is greater than the specification, install a new steering gear.
REFER to: Steering Gear - RWD (211-02 Power Steering, Removal and Installation).

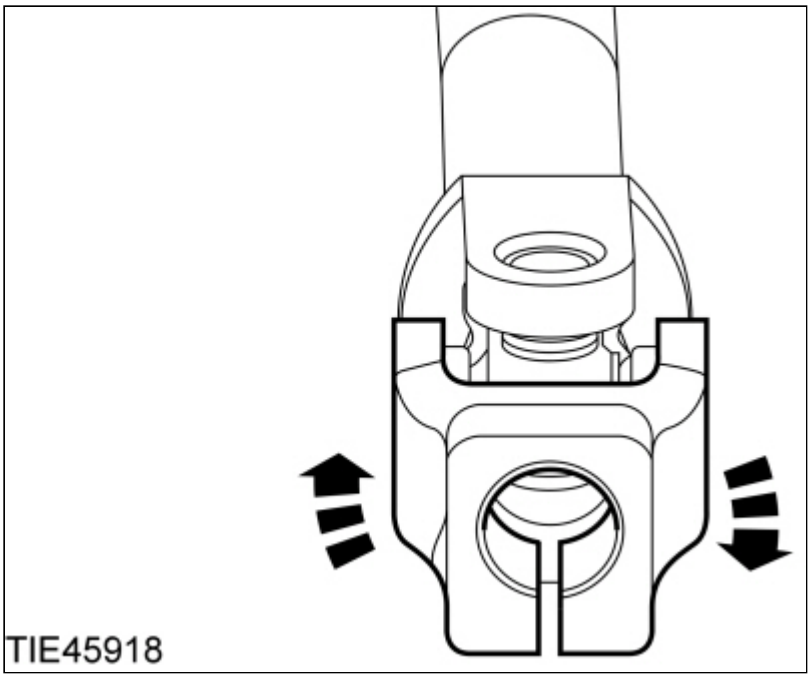
Steering Column Universal Joint

1. **WARNING: Make sure that a new steering column flexible coupling bolt is installed.**

Detach the steering column from the steering gear pinion.
- Discard the steering column to steering gear pinion retaining bolt.



2. Check for smooth movement of the steering column universal joint.
    1. Hold the steering column universal joint yoke.
    2. Articulate the free yoke in a figure of eight movement.
    - If the movement is not smooth or resistance is felt, install a new steering column or shaft as necessary. REFER to: Steering Column (211-04 Steering Column, Removal and Installation).



3. Hold both of the steering column universal joint yokes and twist them clockwise and counterclockwise.
    - If movement is felt, install a new steering column or shaft as necessary. REFER to: Steering Column (211-04 Steering Column, Removal and Installation).

Lower Arm Ball Joint Inspection

1. Raise and support the vehicle. REFER to: Jacking and Lifting (100-02 Jacking and Lifting, Description and Operation).

2. Firmly grasp the outer end of the suspension lower arm and try to move it up and down, watching and feeling for any movement. Free movement will usually be accompanied by an audible "click". There should be no free movement.

3. If there is any free movement, install a new lower arm.
   REFER to: Lower Arm (204-01A Front Suspension - RWD, Removal and Installation).