

STEERING UNIT

SR02-001

STEERING LINKAGE SR02-2

DESCRIPTION SR02-2

COMPONENT LOCATOR SR02-4

SPECIAL TOOL..... SR02-8

OVERHAUL SR02-9

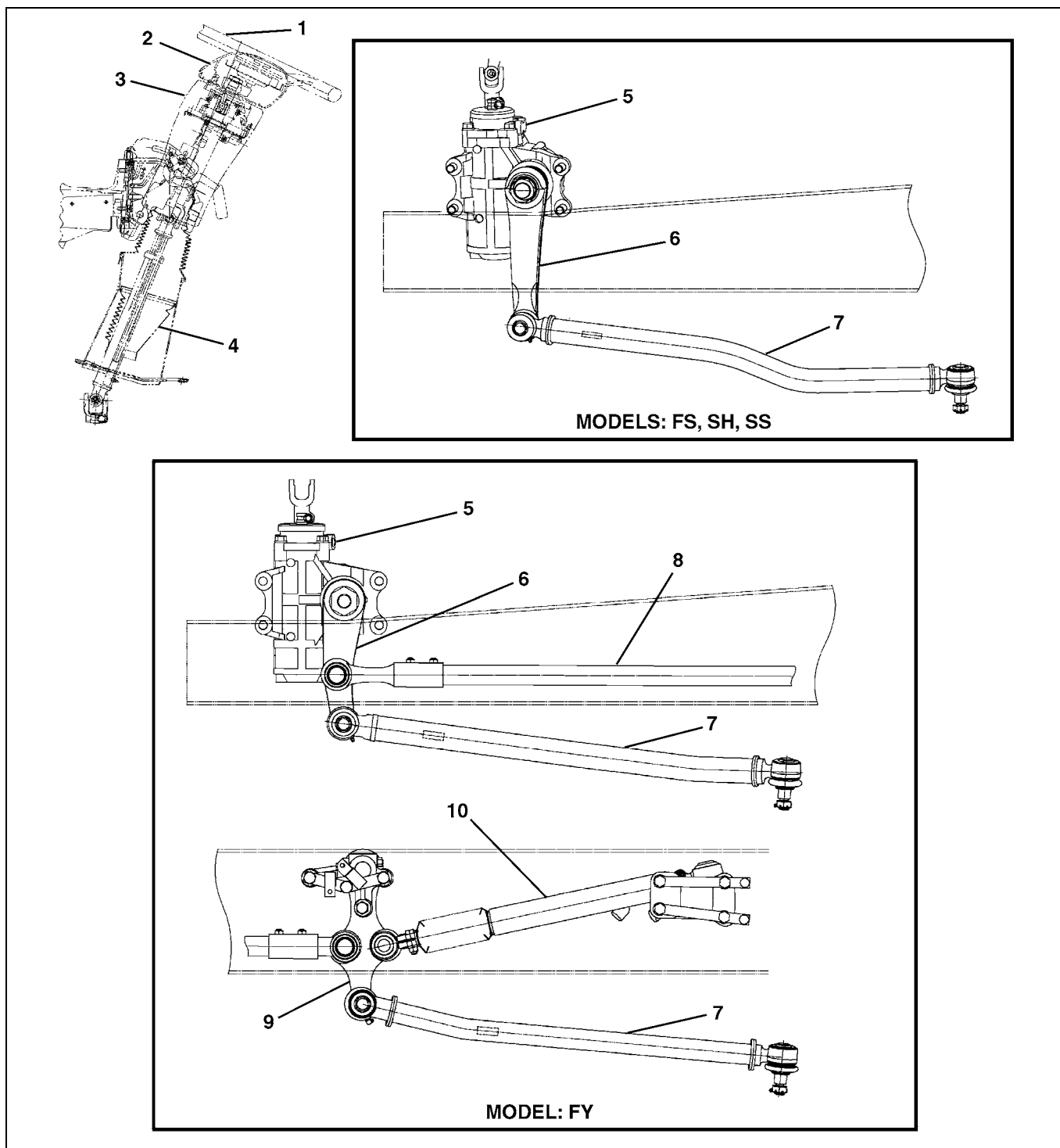
INSPECTION AND REPAIR..... SR02-17

STEERING LINKAGE

DESCRIPTION

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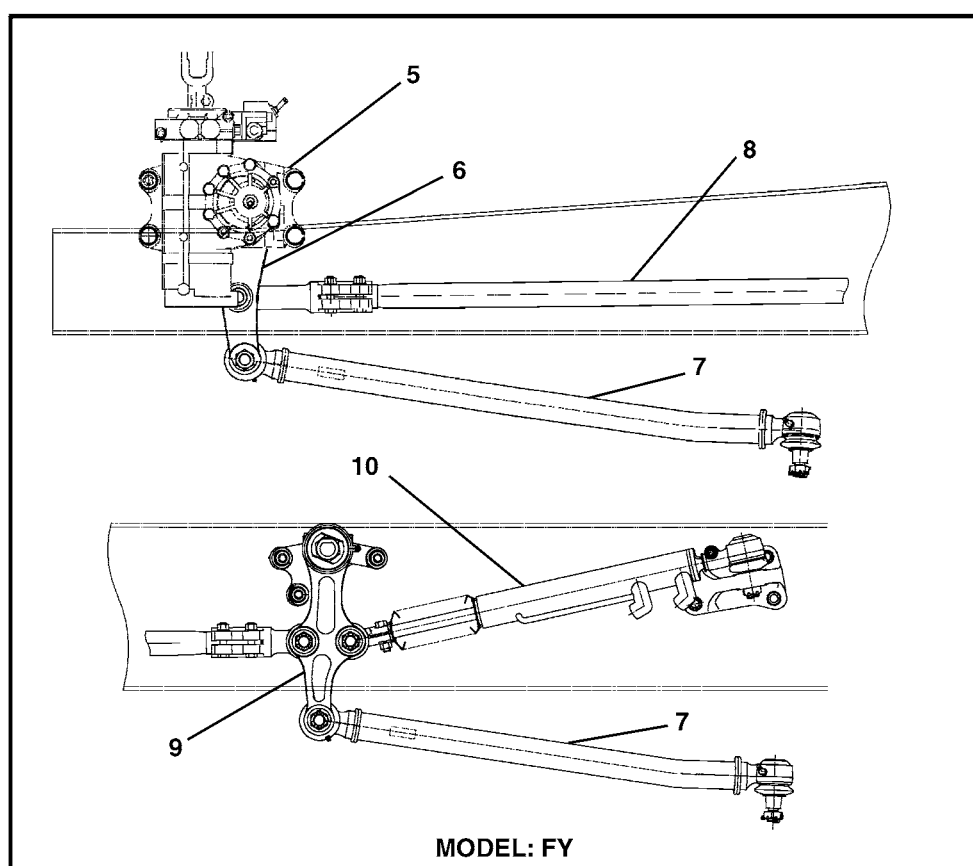
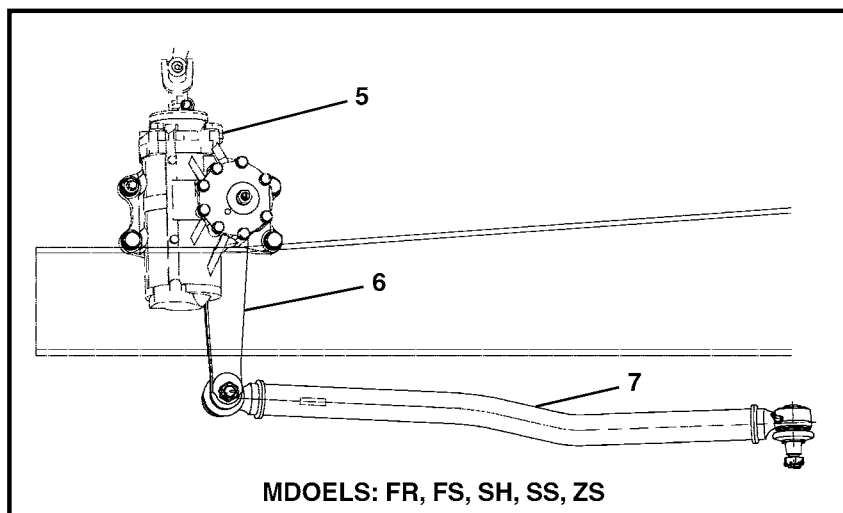
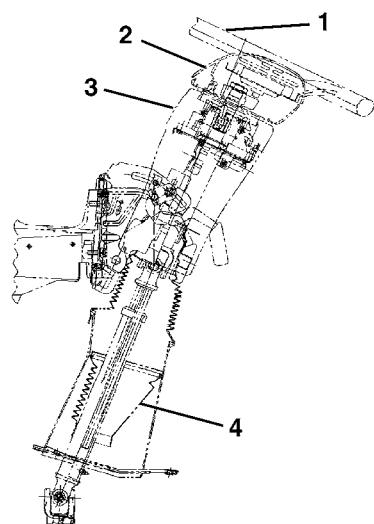
FOR RIGHT-HAND DRIVE MODEL



SHTS07Z070200001

1	Steering wheel	6	Pitman arm
2	Horn button	7	Drag link
3	Steering column assembly	8	Relay rod
4	Dust cover	9	Idler arm
5	Steering gear unit	10	Power steering booster

FOR LEFT-HAND DRIVE MODEL



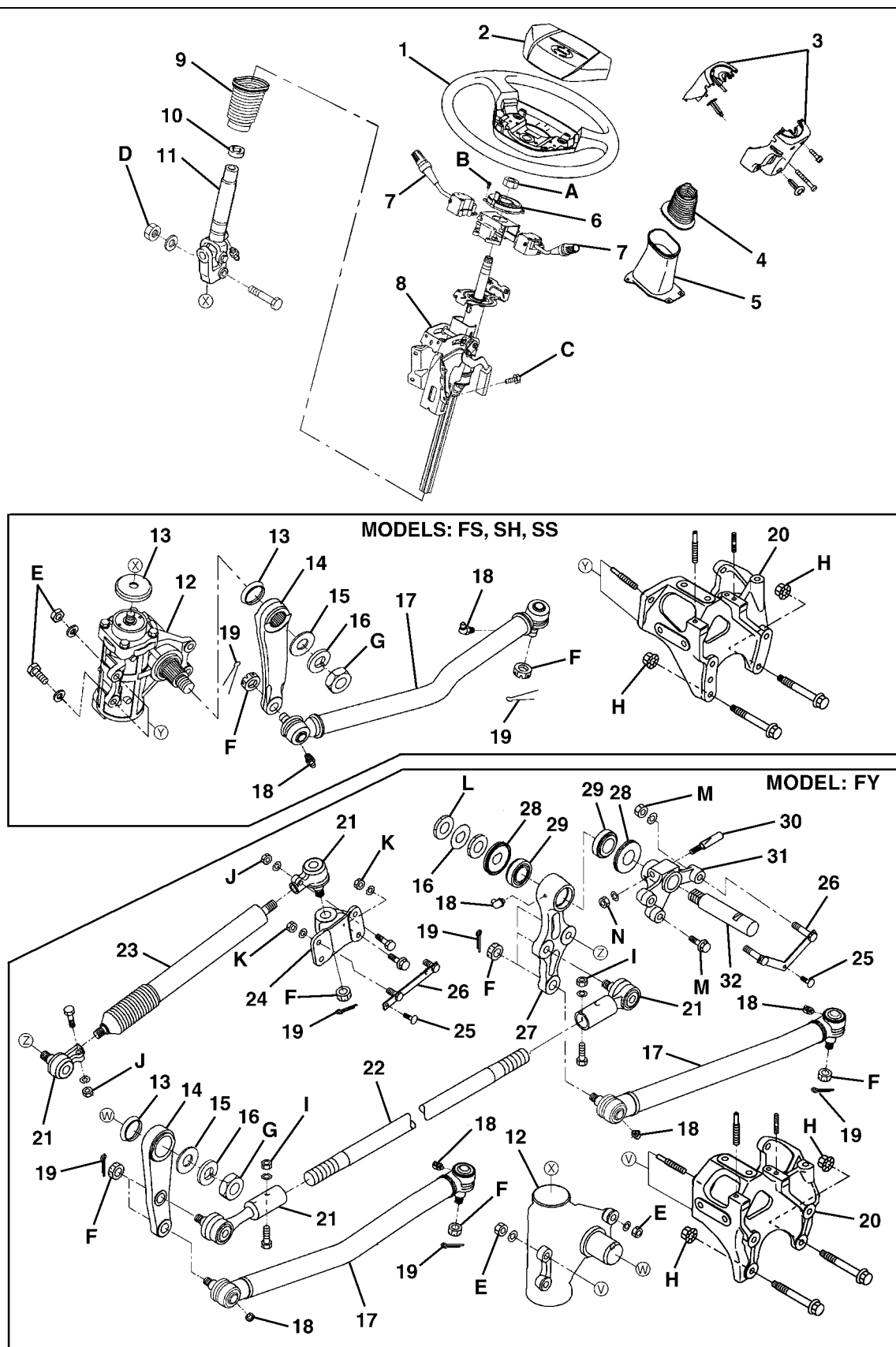
SHTS07Z070200002

1	Steering wheel	6	Pitman arm
2	Horn button	7	Drag link
3	Steering column assembly	8	Relay rod
4	Dust cover	9	Idler arm
5	Steering gear unit	10	Power steering booster

COMPONENT LOCATOR

EN07Z0702D100001

FOR RIGHT-HAND DRIVE MODEL



SHTS07Z070200003

1	Steering wheel	17	Drag link
2	Horn button	18	Lubrication fitting
3	Column cover	19	Cotter pin
4	Column boot	20	Steering gear bracket
5	Column tube	21	Ball joint socket
6	Spiral cable	22	Relay rod
7	Combination switch	23	Power steering booster assembly
8	Steering column assembly	24	Anchor bracket
9	Dust cover	25	Retainer
10	Dust seal	26	Fixture plate
11	Sliding yoke	27	Idler arm
12	Steering gear unit	28	Idler arm dust seal
13	Steering gear unit dust cover	29	Taper roller bearing
14	Pitman arm	30	Lock pin
15	Plain washer	31	Idler arm bracket
16	Lock washer	32	Idler arm pin

Tightening torque

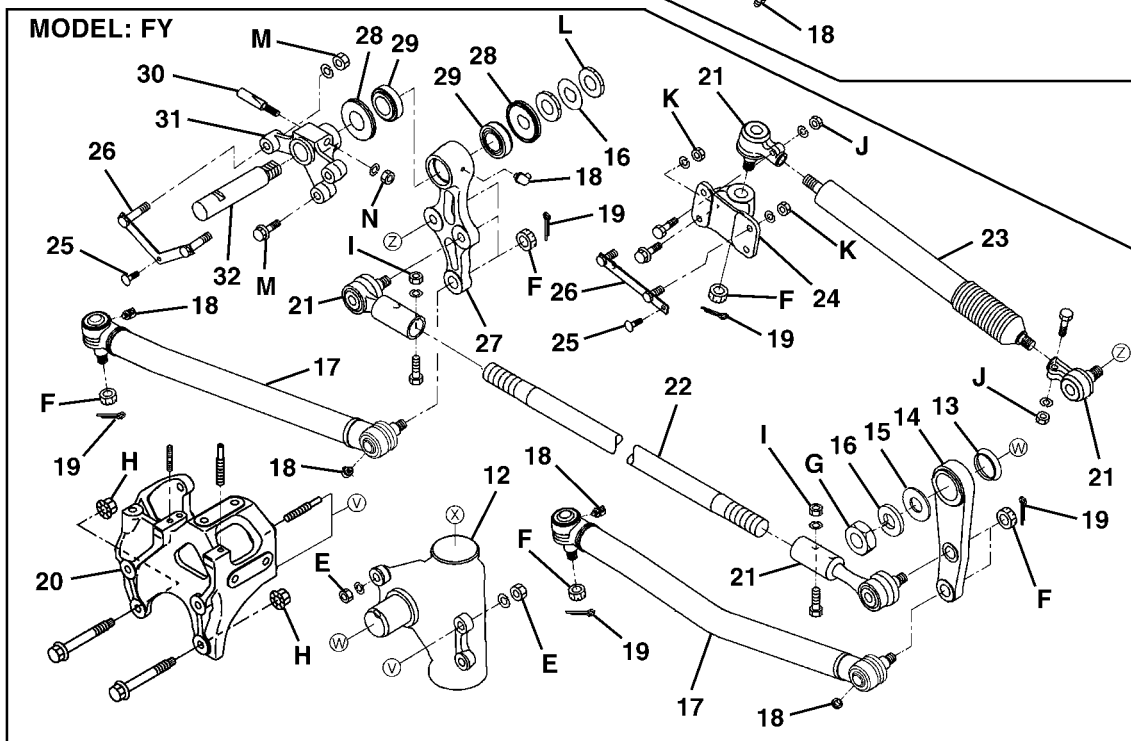
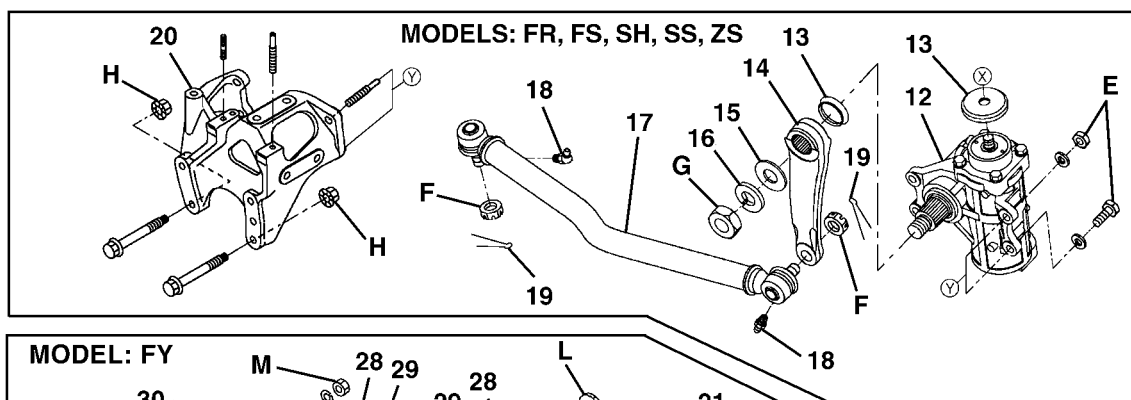
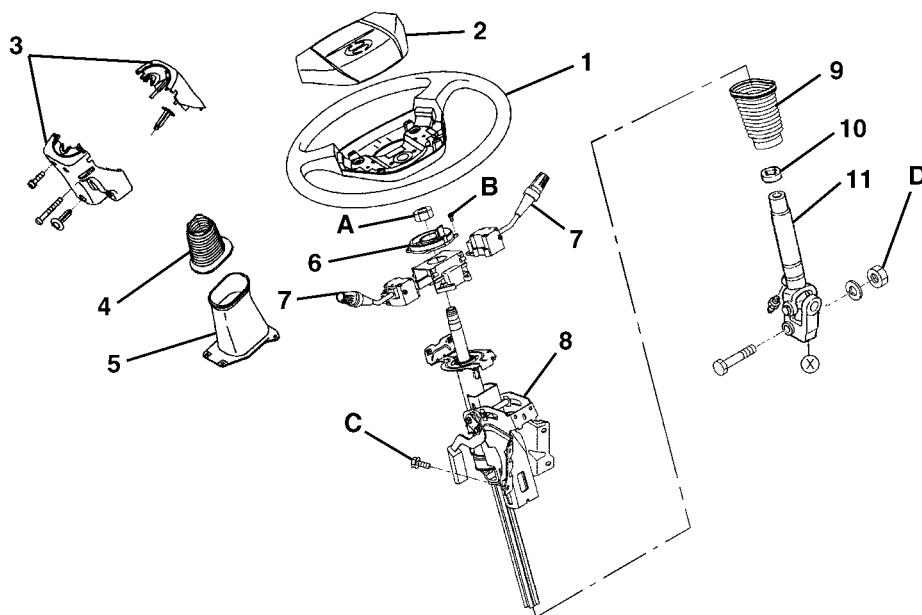
Unit: N·m {kgf·cm, lbf·ft}

A	48.5-77.5 {495-790, 36-57}	H	205-227 {2,091-2,314, 152-167}
B	6.5-13.5 {67-137, 4.8-9.9}	I	85.5-114.5 {872-1,167, 64-84}
C	9.5-16.5 {97-168, 7.1-12.1}	J	64-78 {653-795, 48-57}
D	48.5-57.5 {495-586, 36-42}	K	135.5-184.5 {1,382-1,881, 100-136}
E	326-424 {3,325-4,323, 241-312}	L	291-389 {2,968-3,966, 215-286}
F	146-244 {1,489-2,488, 108-179}	M	166-224 {1,693-2,284, 123-165}
G	391-489 {3,988-4,986, 289-360}	N	39.5-48.5 {403-494, 30-35}

NOTICE

When retightening the nut "H", be sure to replace the nut with new one, because the nut "H" is coated with frictional coefficient stabilizer.

FOR LEFT-HAND DRIVE MODEL



1	Steering wheel	17	Drag link
2	Horn button	18	Lubrication fitting
3	Column cover	19	Cotter pin
4	Column boot	20	Steering gear bracket
5	Column tube	21	Ball joint socket
6	Spiral cable	22	Relay rod
7	Combination switch	23	Power steering booster assembly
8	Steering column assembly	24	Anchor bracket
9	Dust cover	25	Retainer
10	Dust seal	26	Fixture plate
11	Sliding yoke	27	Idler arm
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Tightening torque

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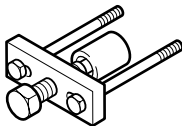
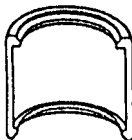
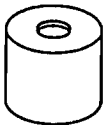
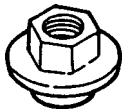
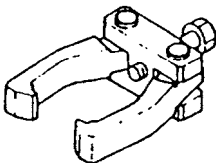
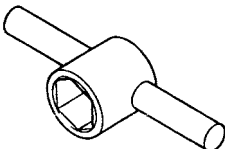
NOTICE

When retightening the nut "H", be sure to replace the nut with new one, because the nut "H" is coated with frictional coefficient stabilizer.

SPECIAL TOOL

EN07Z0702K100001

Prior to starting a steering linkage overhaul, it is necessary to have these special tools.

Illustration	Part number	Tool name	Remarks
	09650-1341	STEERING WHEEL PULLER	
	09657-1790	GUIDE	2 PIECES
	09657-1800	GUIDE	
	9209-20120	NUT	
	09650-1260	PITMAN ARM PULLER	
	09603-1280	SOCKET WRENCH	

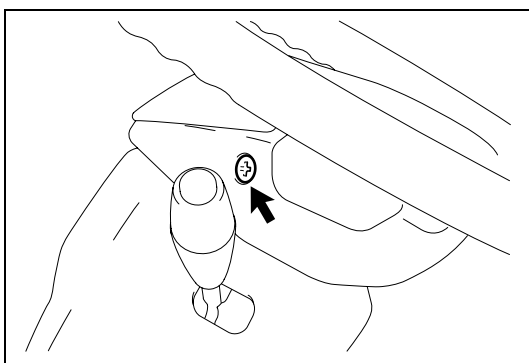
OVERHAUL

EN07Z0702H200001

IMPORTANT POINTS - DISASSEMBLY

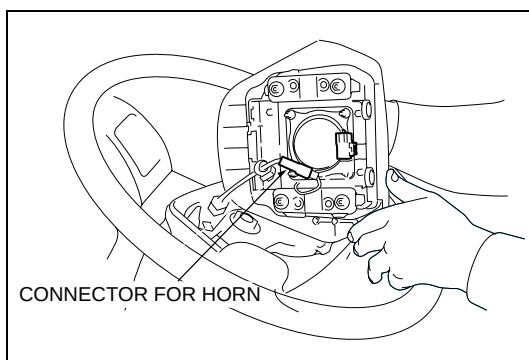
1. REMOVE THE STEERING WHEEL.

- (1) Loosen the torx bolt for fixing the horn button using torx wrench.
- (2) Remove the horn button from the steering wheel.



SHTS07Z070200011

- (3) Remove the connector for the horn.



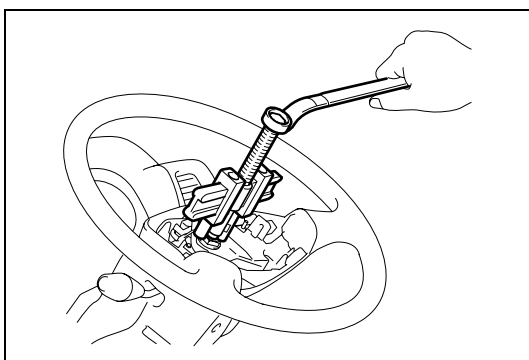
SHTS07Z070200012

- (4) Remove the steering wheel lock nut.
- (5) Use the special tool or commercial tool to remove the steering wheel as shown in the figure.

SST: Steering Wheel Puller (09650-1341)

NOTICE

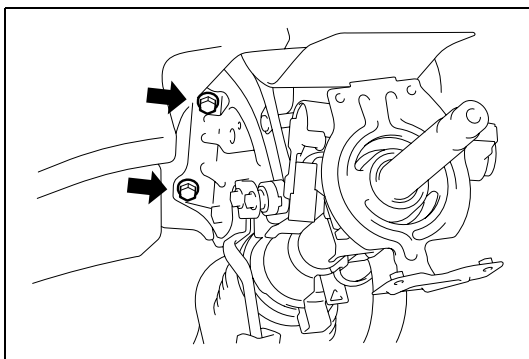
- Before removing the steering wheel from the steering shaft, make aligning marks on both so that they can be assembled in the same position.
 - Because the puller hole is made of aluminum and it is easily damaged, screw the puller bolt deeply.
- (6) Fix the rotating part of spiral cable with tape etc. to prevent the spiral cable from rotating.



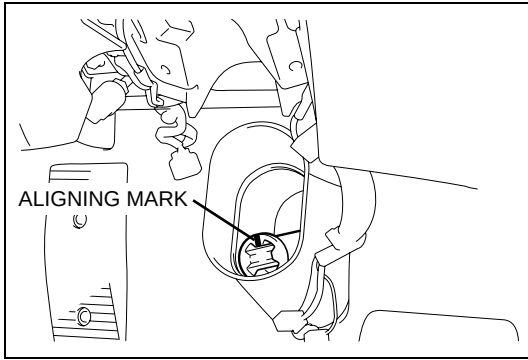
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2. REMOVE THE STEERING COLUMN.

- (1) Remove the steering column bracket mounting bolts.



SHTS07Z070200014

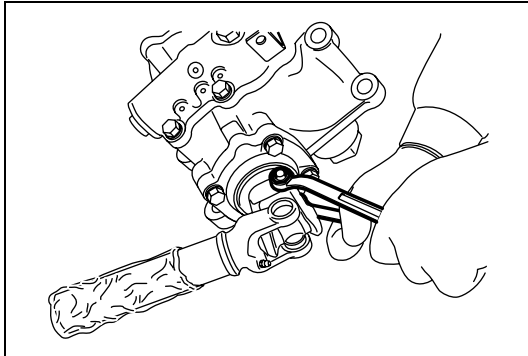


SHTS07Z070200015

- (2) Remove the steering column and the shaft integrally with the column bracket from the steering support bracket.

NOTICE

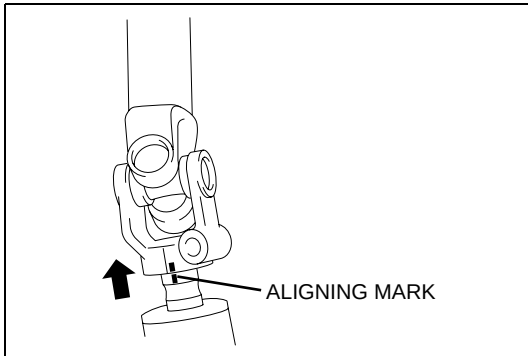
- Before removing the steering column from the steering support bracket, make the aligning marks on both sliding shaft and sliding yoke.
- When removing the sliding shaft, be careful not to scratch the nylon coating of fitting part.



SHTS07Z070200016

3. REMOVE THE UNIVERSAL JOINT.

- (1) Remove the universal joint clamp nut.

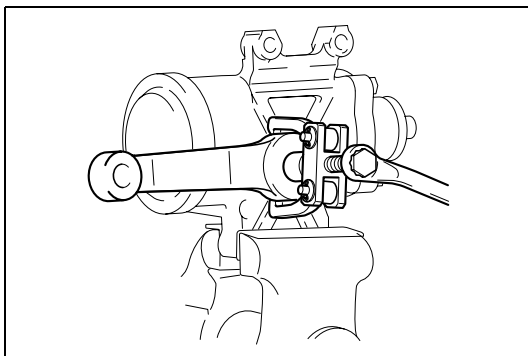


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- (2) Disconnect the universal joint from the steering gear unit.

NOTICE

Before disconnecting, make the aligning marks on both universal joint and steering gear unit.



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4. REMOVE THE PITMAN ARM.

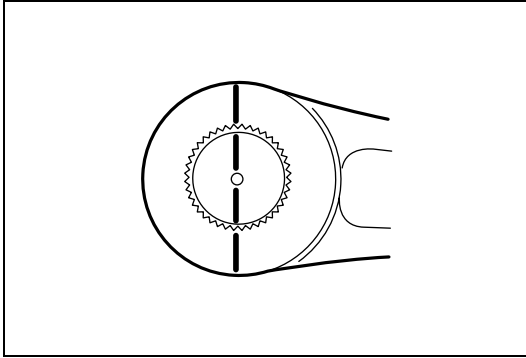
- (1) Remove the nut, lock washer and plain washer from the sector shaft.

NOTICE

Do not use wedges or hit with a hammer.

SST: Socket Wrench (09603-1280)

- (2) Using the special tool, remove the pitman arm.
SST: Pitman Arm Puller (09650-1260)



SHTS07Z070200019

IMPORTANT POINTS - ASSEMBLY

1. INSTALL THE PITMAN ARM.

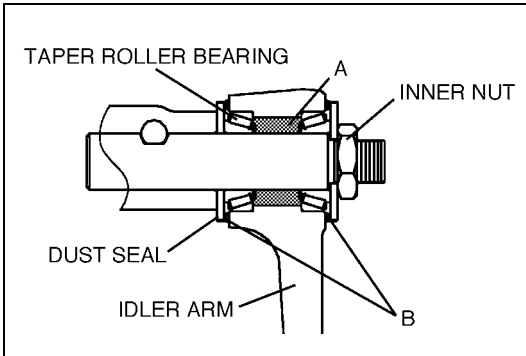
- (1) Through the pitman arm, install the plain washer and lock washer to the sector shaft.

NOTICE

Align the aligning marks.

- (2) Tighten the nut to the specified torque.

SST: Socket Wrench (09603-1280)



SHTS07Z070200020

2. INSTALL THE IDLER ARM. (MODEL: FY)

- (1) Fill chassis grease with the taper roller bearings and the space between the bearings "A".

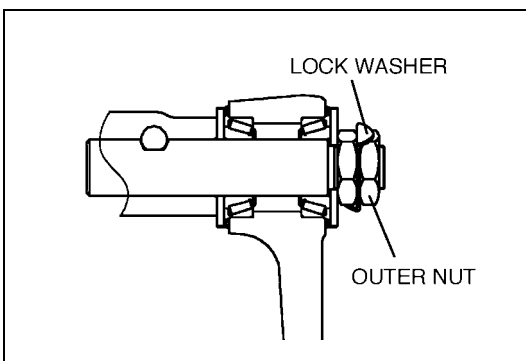
- (2) Install the idler arm to the idler arm pin, and tighten the inner nut.

Tightening Torque:

147.5-156.5 N·m {1,504-1,595 kgf·cm, 109-115 lbf·ft}

NOTICE

Before installation, apply chassis grease to the lip part of the dust seal "B".

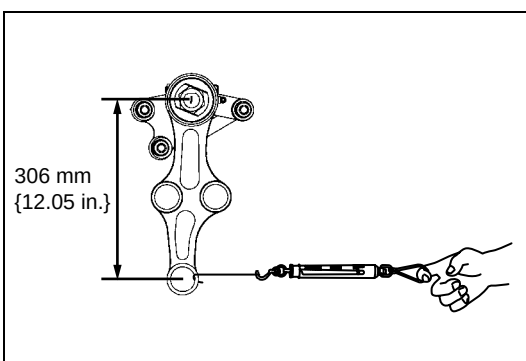


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- (3) Loosen the inner nut by 1/4 turn, and then tighten the outer nut.

Tightening Torque:

291-389 N·m {2,968-3,966 kgf·cm, 215-286 lbf·ft}

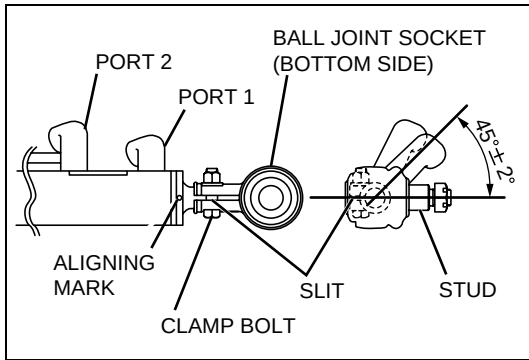


SHTS07Z070200022

- (4) Swing the idler arm and gently strike the bracket with a copper hammer then measure the turning torque, using spring balancer.

Turning torque (N·m {kgf·cm, lbf·ft})	1.97-3.92 {20-39, 1.5-2.8}
Spring balancer reading (N {kgf, lbf})	6.5-12.4 {0.7-1.2, 1.4-2.8}

- (5) If the turning torque is out of above range, readjust from item 1.
- (6) After adjusting the turning torque, bend the lock washer.

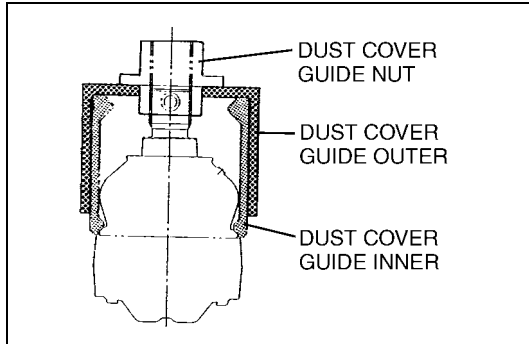


SHTS07Z070200023

3. INSTALL THE POWER STEERING BOOSTER. (MODEL: FY)

NOTICE

- When installation of ball joint socket, it should be made an angle of 43°-47° with slit of the ball joint socket and the port 1, and then tighten clamp bolt.
- After tighten the clamp bolt, check that the slit of ball joint socket is aligned with the mark on power steering booster body.



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4. IF NECESSARY, REPLACE THE DUST SEAL OF DRAG LINK AND RELAY ROD.

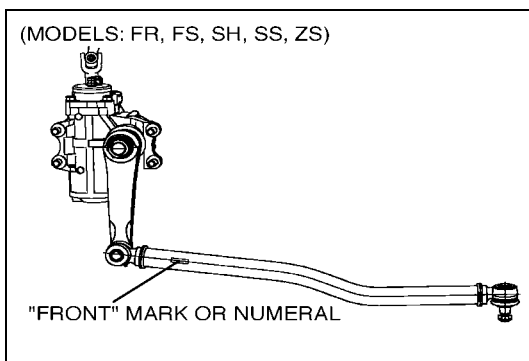
- (1) Observe the following procedure when changing the dust seal.
 - a. Pry off the dust seal with a screw driver.
 - b. Put 6.5 g {0.23 oz} of lithium molybdenum grease in the seal.
 - c. Use the special tools to install the dust seal onto the socket without damaging it.

SST:

Dust Cover Guide Inner (09657-1790)

Dust Cover Guide Outer (09657-1800)

Dust Cover Guide Nut (9209-20120)



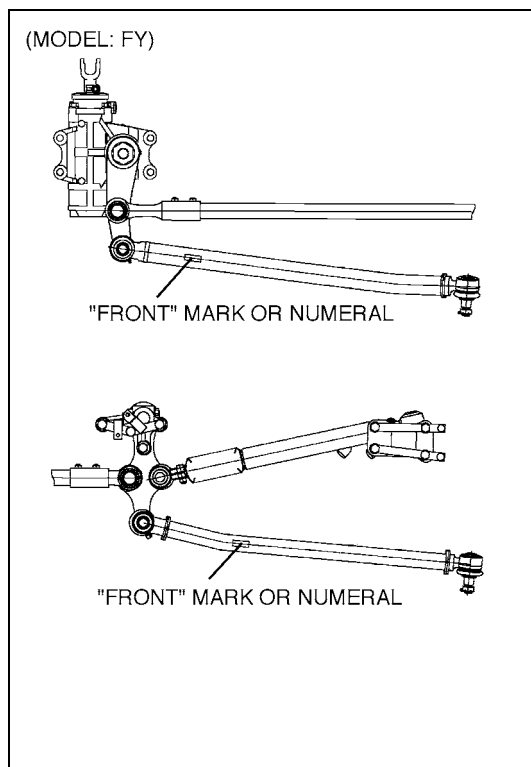
SHTS07Z070200024

5. INSTALL THE DRAG LINKS AND RELAY ROD.

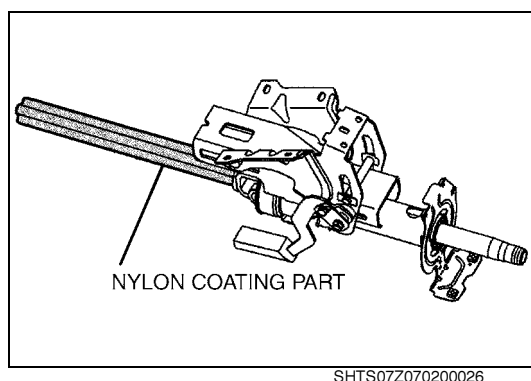
- (1) Connect the drag links and relay rod with the pitman arm, the knuckle arm and the idler arm.

NOTICE

- At this time, make sure that the arrow "FRONT" or numeral on the drag links is positioned toward the front of vehicle.
- When handling the drag links and relay rod, take care not to damage the dust seal.



- (2) Tighten the slotted nuts of the ball studs at both ends of the link to the specified torque, and then secure the nuts with the cotter pins.

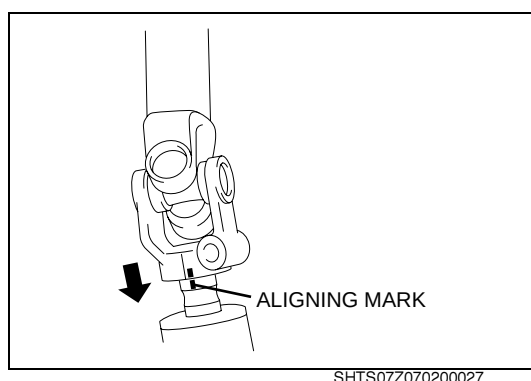


6. INSTALL THE STEERING COLUMN.

- (1) Apply chassis grease to the nylon coating part of sliding shaft, and install the steering column to the steering support bracket.

NOTICE

When assembling, take care not to damage the steering shaft spline.



7. INSTALL THE UNIVERSAL JOINT.

- (1) Set front axles toward rectilinear direction.
 (2) Apply chassis grease to sliding shaft of steering shaft and install the steering yoke to the sliding shaft.

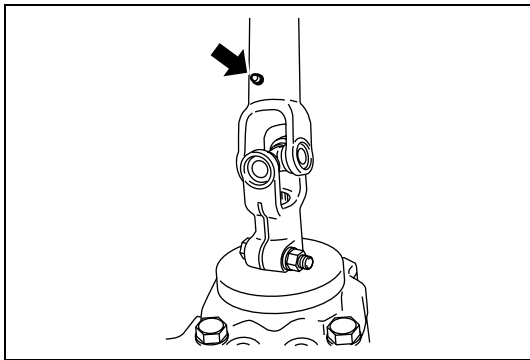
NOTICE

Align the aligning mark.

- (3) Install the universal joint to steering gear unit with clamp bolt and clamp nut.

NOTICE

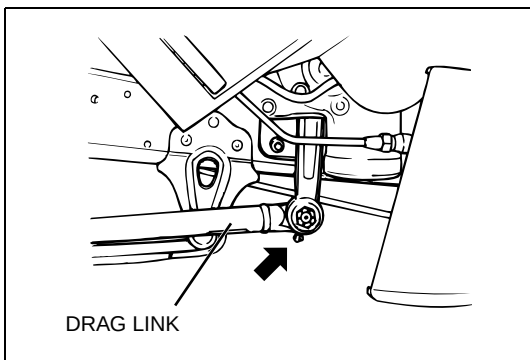
Align the aligning mark.



SHTS07Z070200028

8. LUBRICATE THE STEERING SHAFT.

- (1) Lubricate the steering shaft with chassis grease, using the lubrication fitting located on the steering yoke.



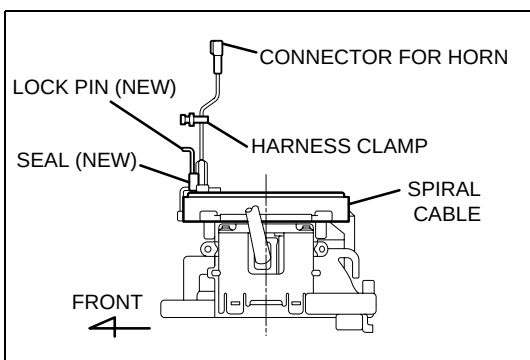
SHTS07Z070200029

9. LUBRICATE THE DRAG LINK.

- (1) Lubricate the ball joint of drag link with chassis grease, using the lubrication fittings.

NOTICE

Lubricate the grease till it overflows from the dust cover hole.



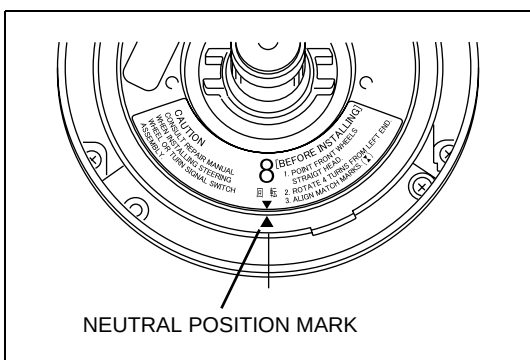
SHTS07Z070200030

10. INSTALL THE STEERING WHEEL.

- (1) Set front axles toward rectilinear direction.
- (2) When spiral cable is new, make sure that the lock pin is seated in the spiral cable assembly and the seal is not cut. When spiral cable is reused, make sure that the neutral position of the spiral cable does not get out of position.

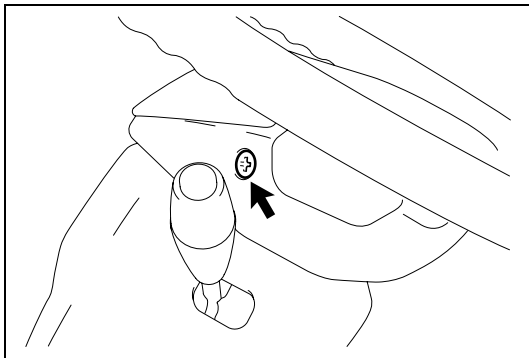
NOTICE

When there is no lock pin though the spiral cable is new, or when the seal is cut though there is a lock pin, or when the neutral position of the spiral cable gets out of position in reuse, turn the spiral cable counterclockwise lightly. And turn it back clockwise by 4 rotations at the point of beginning of the hard steering. Then match the neutral position marks on the upper side of the spiral cable assembly.



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- (3) Pass the spiral cable through the steering wheel opening area and set the steering wheel straight to install it with nut. When the spiral cable is new, remove the lock pin. When it is reused, remove the tape etc. for fixing the rotation of the spiral cable.



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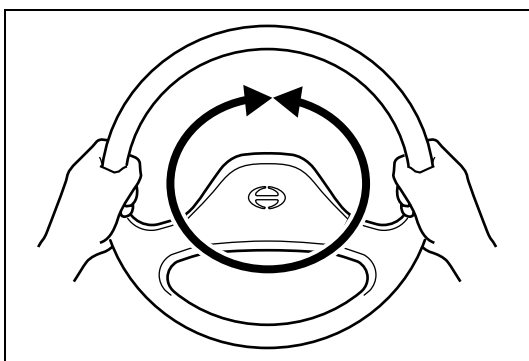
- (4) Tighten the set screw for fixing the horn button after pushing it in by using a torx wrench.

Tightening Torque:

6.5-13.5 N·m {66-138, 4.8-9.9 kgf·cm}

11. ADJUST THE ALIGNMENT BETWEEN FRONT FORWARD AXLE AND FRONT REARWARD AXLE. (MODEL: FY)

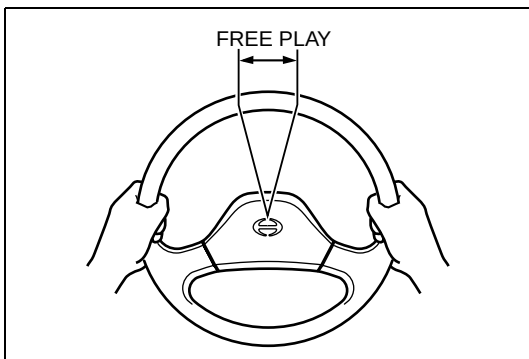
- (1) Refer to the section "INSPECTION AND ADJUSTMENT" in the chapter "FRONT AXLE (MF78I)".



SHTS07Z070200032

12. INSPECT THE STEERING SYSTEM FOR OPERATING ABILITY.

- (1) Place the front wheels on turn tables.
(2) Make sure that the steering wheel turns smoothly without any jolts or abnormal resistance when the steering wheel is turned full range.



SHTS07Z070200033

- (3) Check the steering wheel free play while engine is idling.

Wheel free play: 15-35 mm {0.591-1.377 in.}

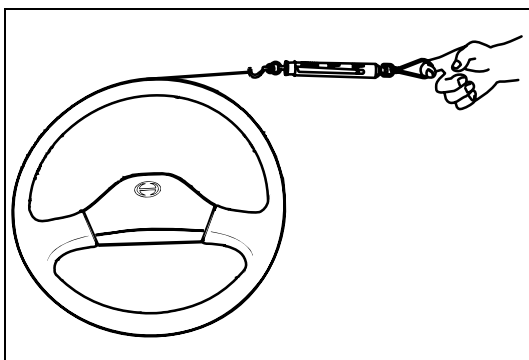
- (4) Check the steering wheel axial play.

Wheel axial play: Less than 0.1 mm {0.004 in.}

- (5) If wheel free play exceeds 15-35 mm {0.591-1.377 in.}, turn the set screw clockwise to decrease wheel free play and counter-clockwise to increase it.

⚠ WARNING

Excessive steering wheel free play may adversely affect vehicle handling. This can result in personal injury and/or property damage.



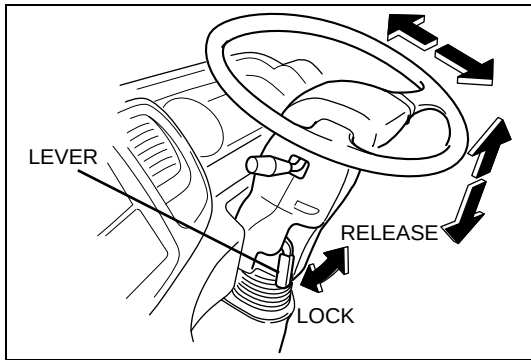
SHTS07Z070200034

- (6) Measure the steering wheel turning force. Use a spring balancer to measure the steering wheel turning force.

NOTICE

Measure the steering wheel turning force while the engine is idling.

Turning force: 40 N {4.1 kgf, 8.9 lbf}



SHTS07Z070200035

- (7) The steering wheel must be locked securely in any position up, down, forward and backward.

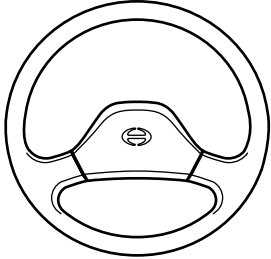
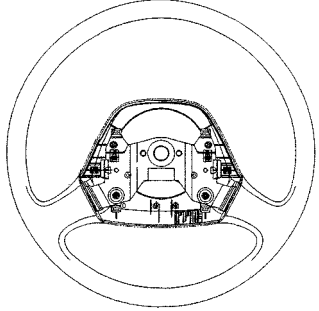
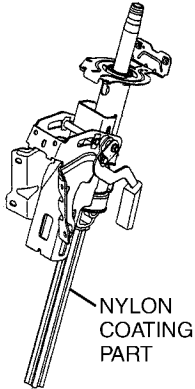
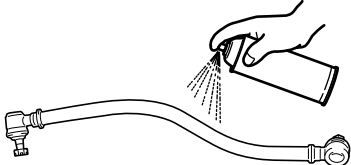
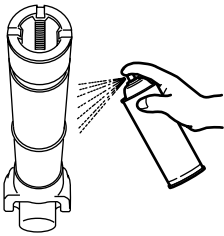
⚠ WARNING

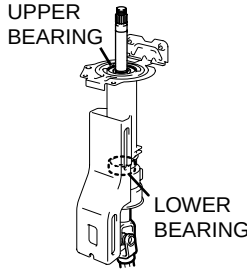
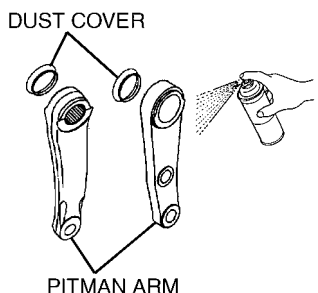
Before moving the vehicle, tighten the lever securely and try to move the steering wheel up and down, and forward and backward to make sure that it is locked securely. Never try to adjust the steering wheel position while the vehicle is moving. Any adjustment of the steering wheel while driving can cause the driver to lose control, and result in personal injury and/or property damage.

- (8) Check to see that the combination switch is operating properly.

INSPECTION AND REPAIR

EN07Z0702H300001

Inspection item	Standard	Limit	Remedy	Inspection procedure
Steering wheel: Cracks, distortion and damage	—	—	Replace, if necessary.	Visual check 
Steering wheel serration: Wear and damage	—	—	Replace, if necessary.	Visual check 
Steering column assembly: Bent, oscillation and cracks Nylon coating part: Damage	—	—	Replace, if necessary	Visual check 
Drag link: Cracks and damage Ball joint: Play Dust seal: Damage	—	—	Replace the whole drag link assembly or replace only dust cover.	Use the magnetic flaw detector or color checking instrument. 
Universal joint assembly: Oscillation, Play, Damage Oil seal: Damage	—	—	Replace, if necessary.	Use the magnetic flaw detector or color checking instrument. 

Inspection item	Standard	Limit	Remedy	Inspection procedure
Column tube: Cracks, Bent Ball bearing: Play, Poor rotation	—	—	Replace, if necessary.	Visual check 
Pitman arm: Cracks, Bent Dust cover, Wear, Damage	—	—	Replace, if necessary.	Use the magnetic flaw detector or color checking instrument. 
Idler arm: Cracks, Bend Dust seal: Wear, Damage Taper roller bearing: Play, Poor rotation, Burns, Pitting Idler arm pin: Cracks, Bend Idler arm bracket: Cracks, Bend	—	—	Replace, if necessary.	Use the magnetic flaw detector or color checking instrument. 