

SPECIAL EQUIPMENT

SECTION **SE**

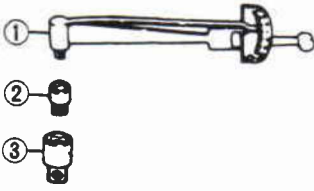
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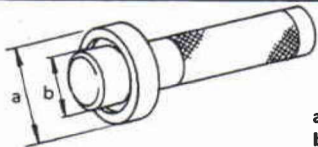
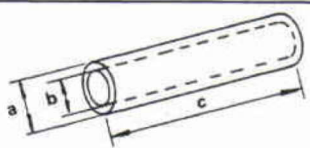
PREPARATION

SPECIAL SERVICE TOOL

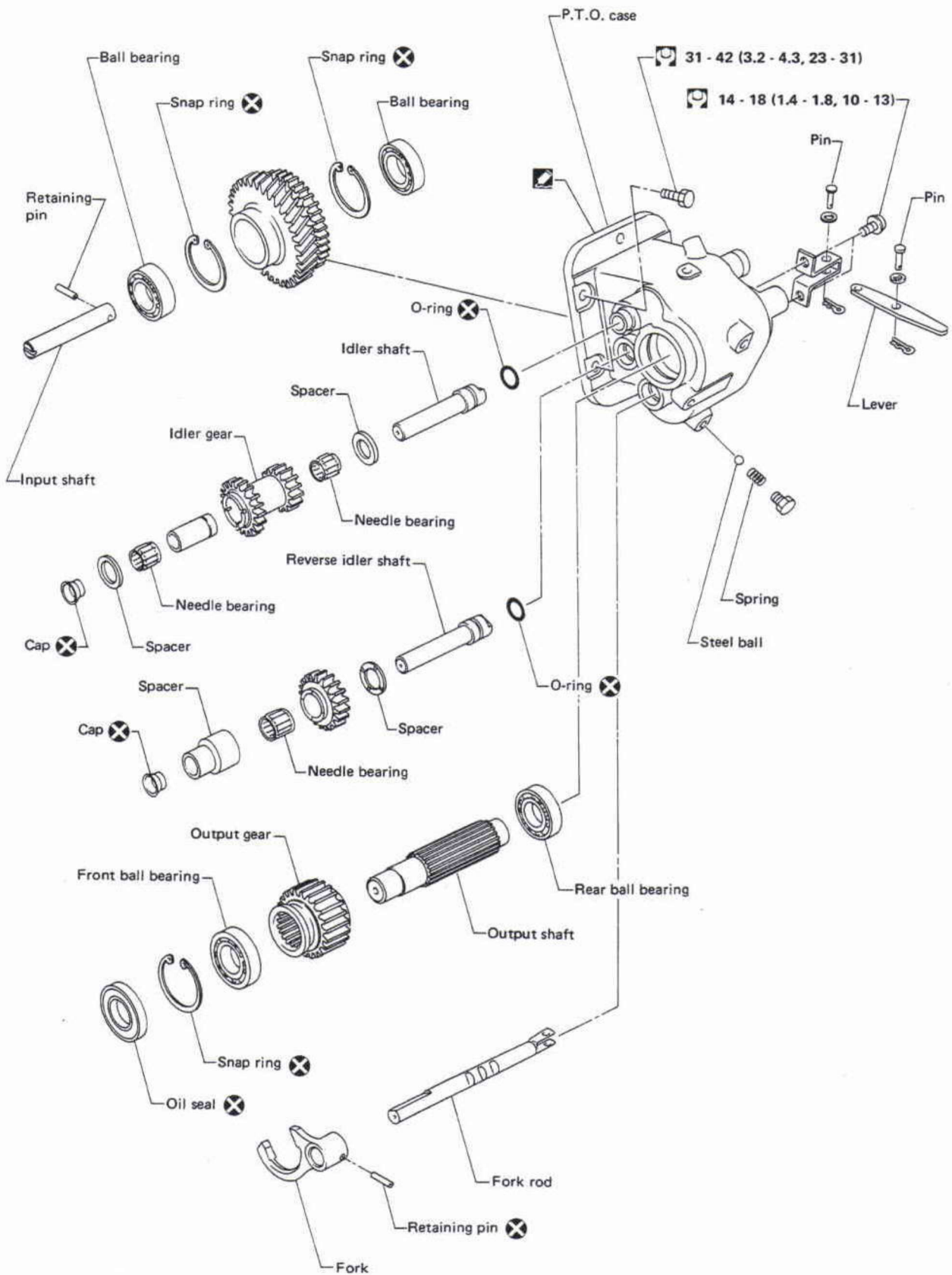
*: Special tool or commercial equivalent

Tool number Tool name	Description
ST3127S000* ① GG91030000 Torque wrench ② HT62940000 Socket adapter ③ HT62900000 Socket adapter	Measuring turning torque 

COMMERCIAL SERVICE TOOLS

Tool name	Description
Drift	Installing oil seal  <p>a: 44 mm (1.73 in) dia. b: 22 mm (0.87 in) dia.</p>
Drift	Installing output shaft  <p>a = 23 mm (0.91 in) dia. b = 19 mm (0.75 in) dia. c = 90 mm (3.54 in)</p>

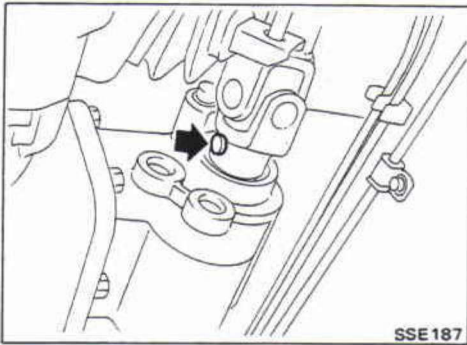
POWER TAKE OFF (P.T.O.)



☐ : N·m (kg·m, ft·lb)

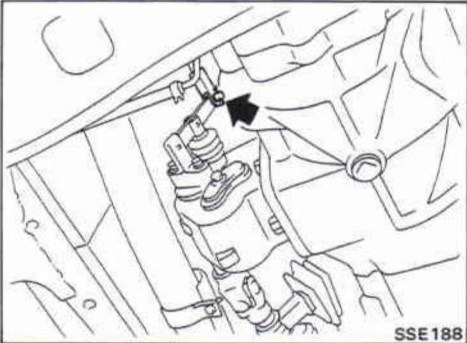
SSE186

POWER TAKE OFF (P.T.O.)

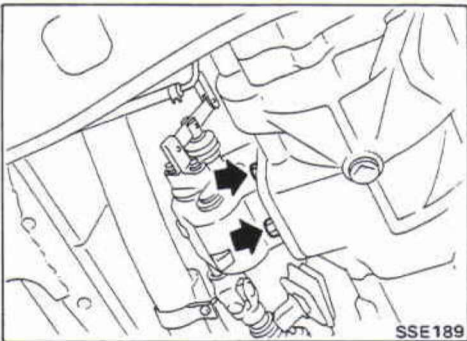


Removal

1. Drain oil from transmission case.
2. Remove pin from drive shaft.



3. Remove P.T.O. control cable.



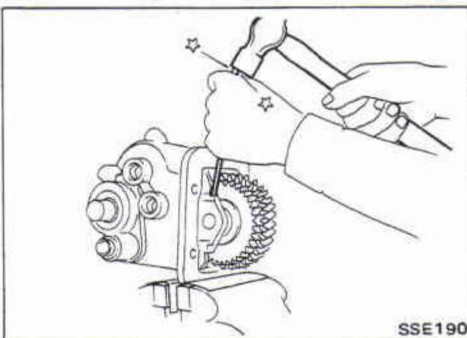
4. Remove P.T.O. unit.

Installation

- Before installing, clean mating surfaces of P.T.O. case and transmission case.
- Remove filler plug and fill transmission with recommended gear oil.
- Apply sealant to threads of filler plug, and install P.T.O. unit to transmission case. Refer to MT section.

Disassembly

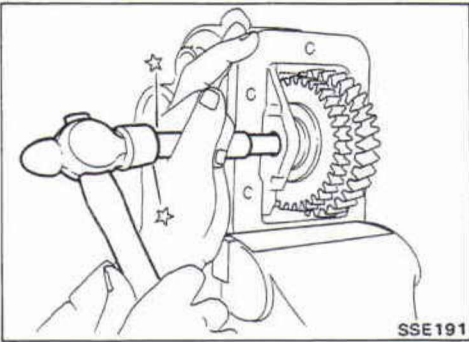
1. Remove retaining pin.



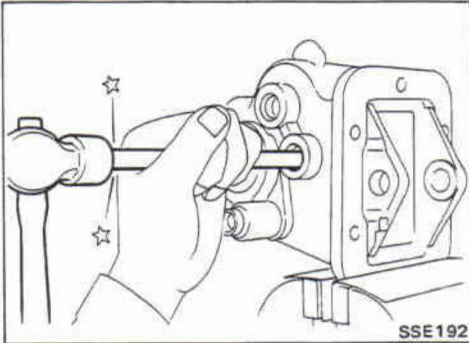
POWER TAKE OFF (P.T.O.)

Disassembly (Cont'd)

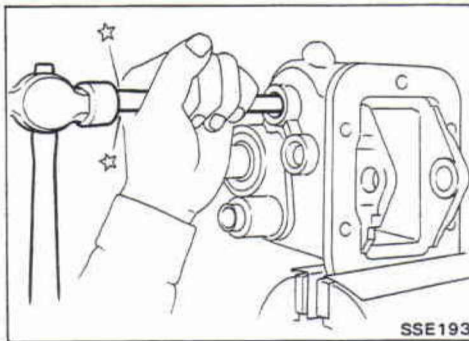
2. Remove input shaft.



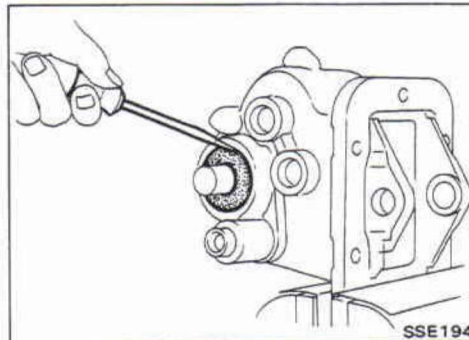
3. Remove idler shaft.



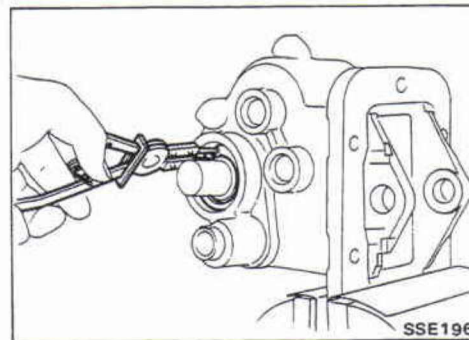
4. Remove reverse idler shaft.



5. Remove oil seal.

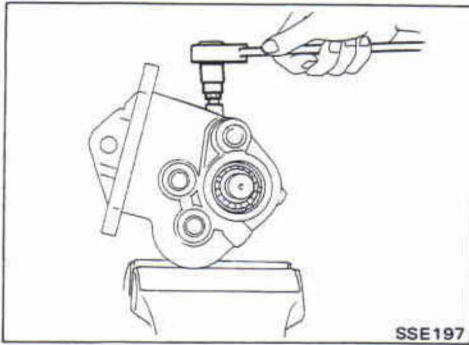


6. Remove snap ring.

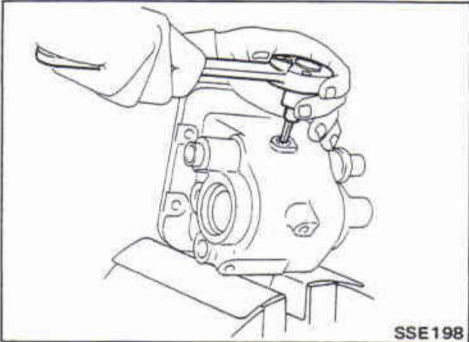


POWER TAKE OFF (P.T.O.)

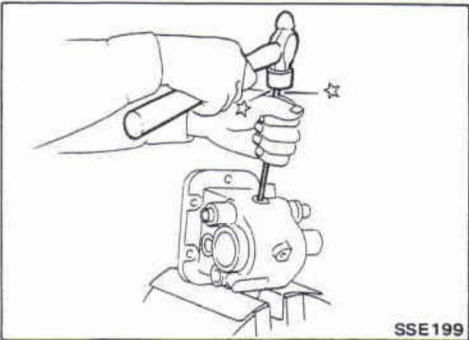
Disassembly (Cont'd)



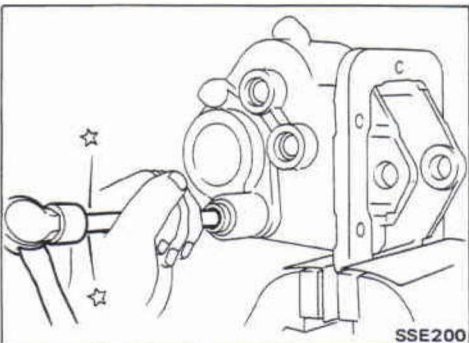
7. Remove screw.
8. Remove output shaft.



9. Remove screw.



10. Remove pin.



11. Remove lever.

Inspection

P.T.O. CASE

- Clean with solvent and check for cracks or chips.
- Check mating surface of P.T.O. case for small nicks or projection.
Replace if necessary.

GEARS AND SHAFTS

- Check all gears for excessive wear, chips or cracks.
Replace if necessary.
- Check shaft for bending, cracks, wear, and worn splines.
Replace if necessary.

POWER TAKE OFF (P.T.O.)

Inspection (Cont'd)

END PLAY

- After assembling P.T.O. unit, check idler gear and reverse gear end plays.

Standard end play:

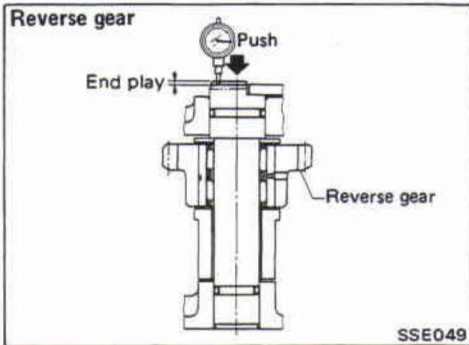
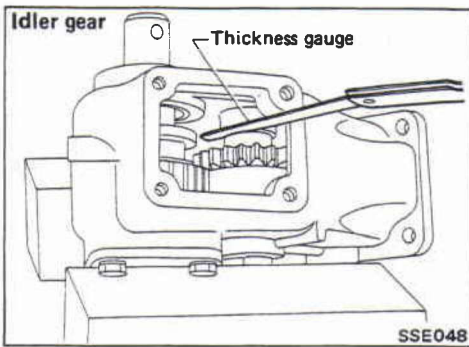
Reverse gear

0.02 - 0.50 mm (0.0008 - 0.0197 in)

Idler gear

0.02 - 0.50 mm (0.0008 - 0.0197 in)

- If end play is out of specified limit, disassemble and check parts for condition.
Replace if necessary.



BEARINGS

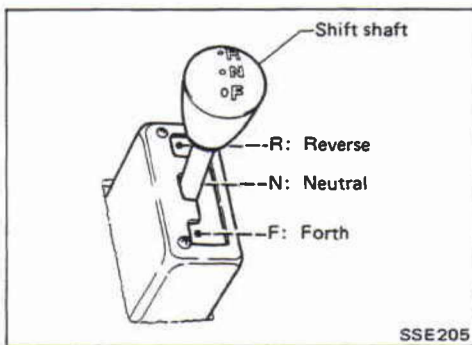
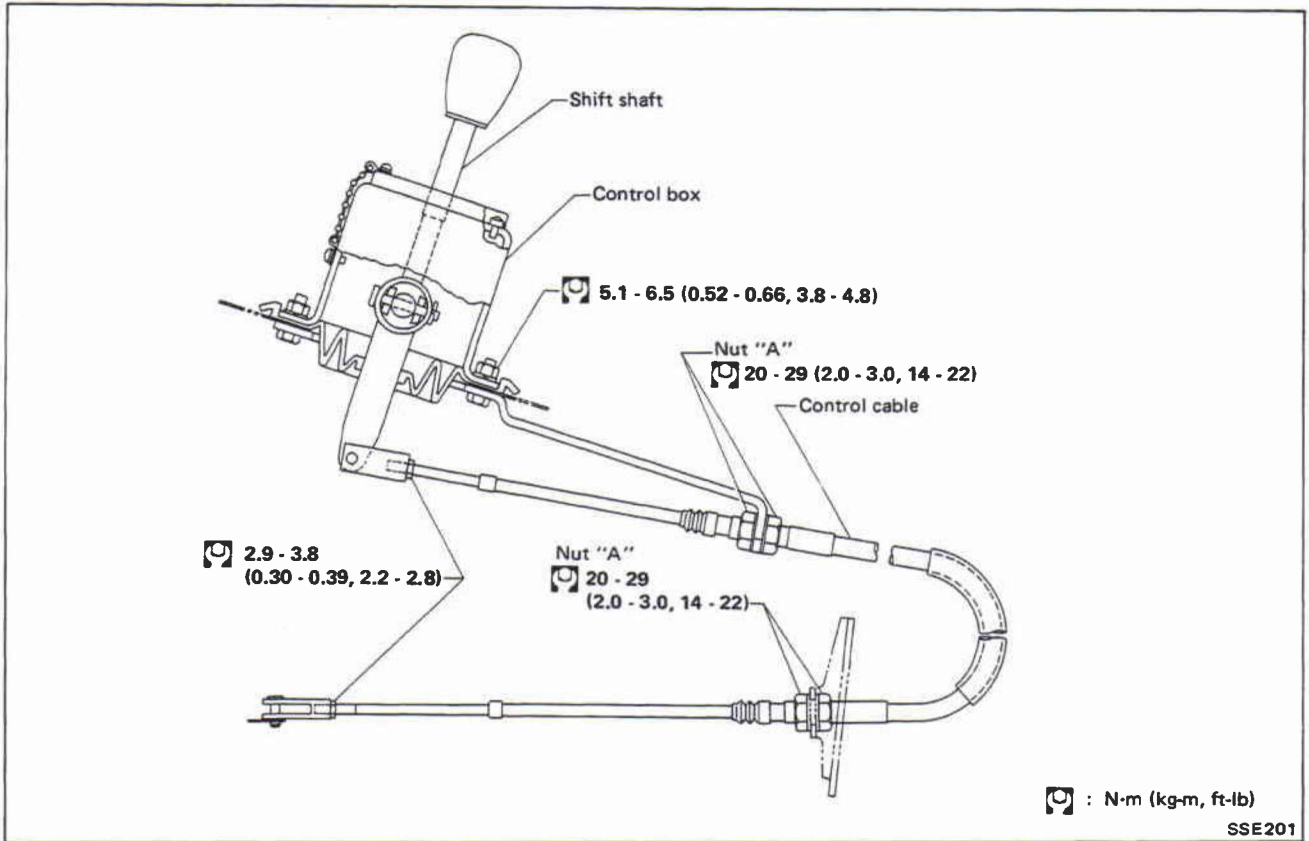
- Check race and ball surfaces for worn or rough.
- Check needle bearing for worn or damaged.
Replace bearing if necessary.

OIL SEALS

- Check oil seal lip contacting with shaft.
Replace if necessary.

CONTROL CABLE

Removal and Installation

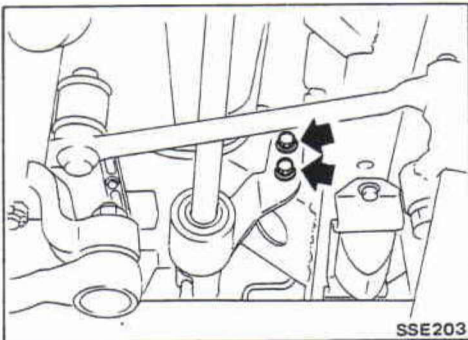
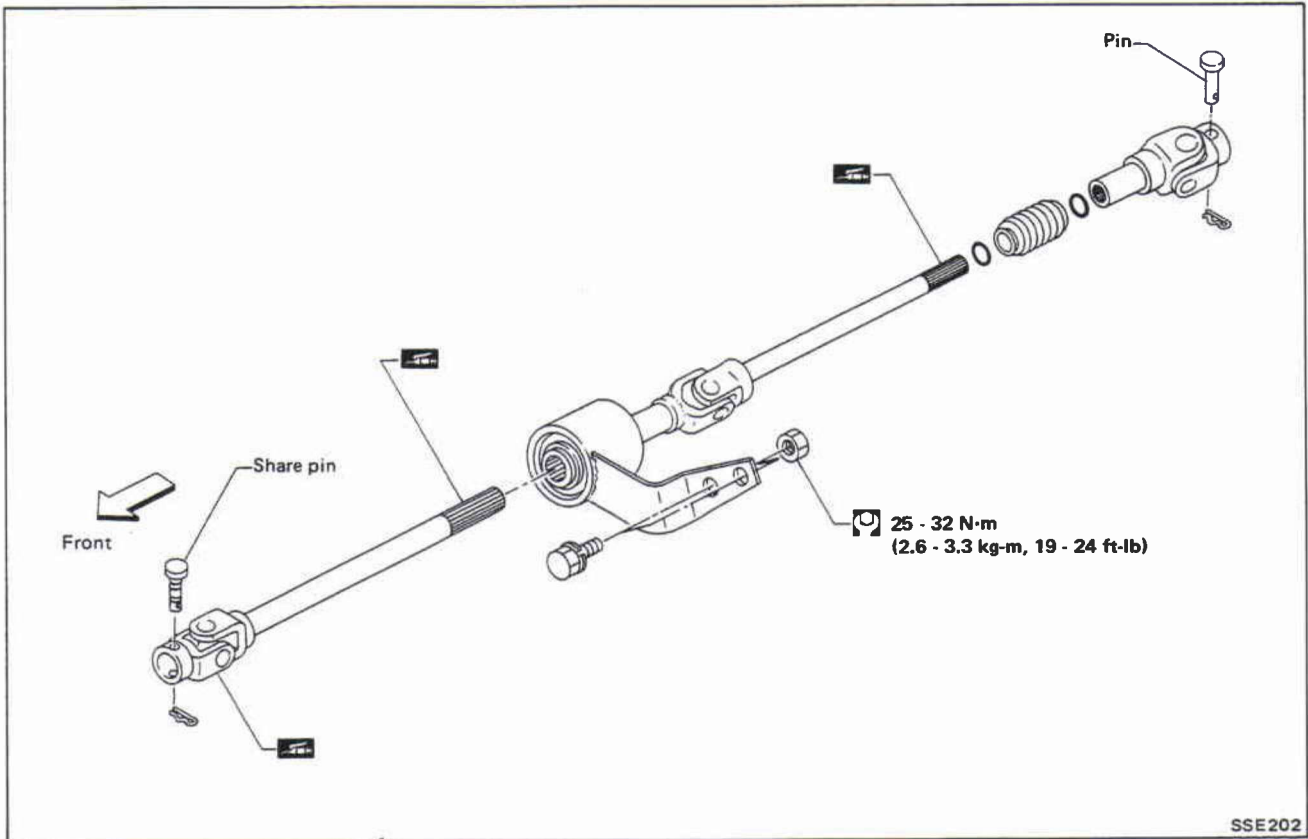


Adjustment

1. Set shift shaft at "F" position.
2. Loosen nuts "A" and set them in middle portion of threads.
3. Tighten nuts "A".
4. Make sure that shift shaft can be shifted at all positions and moves smoothly.

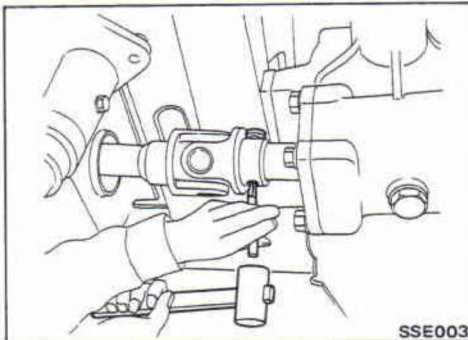
DRIVE SHAFT

Removal and Installation



Removal

1. Remove center bearing bracket securing bolts.

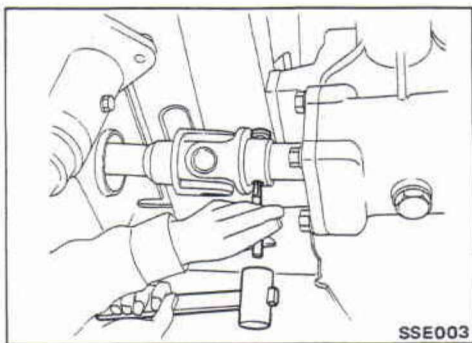
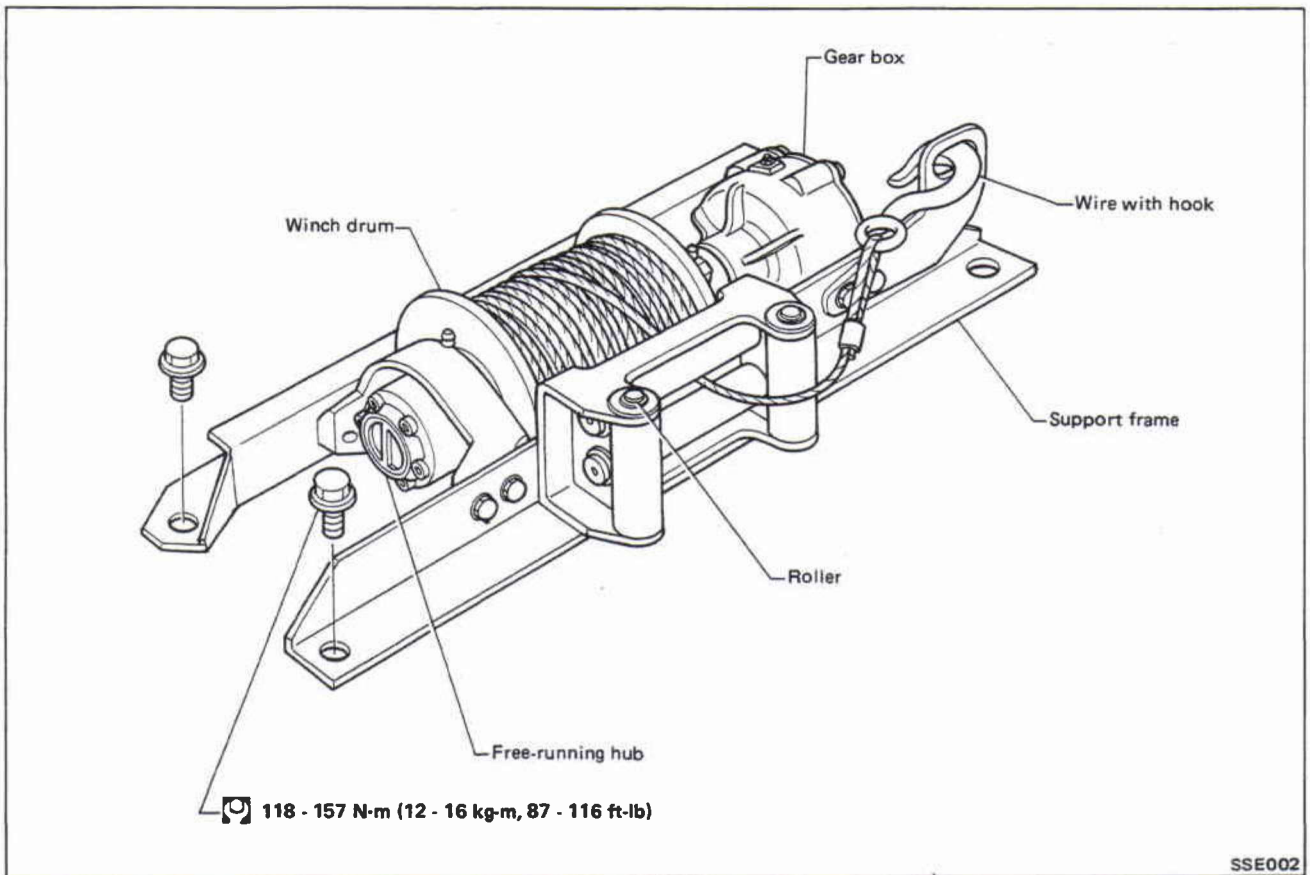


2. Disconnect share pin on winch side. If it proves difficult to remove, knock it out with a suitable tool.

Inspection

- Check splined shaft for excessive play, wear or damage and replace as an assembly if required.
- Check joint and shear pin for any bends or deformation.

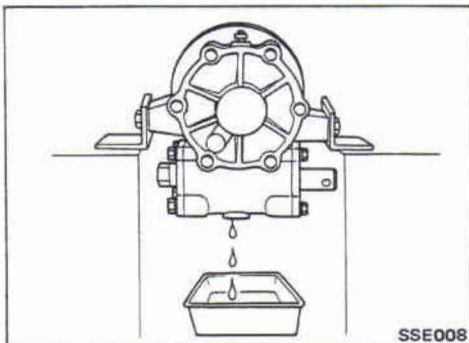
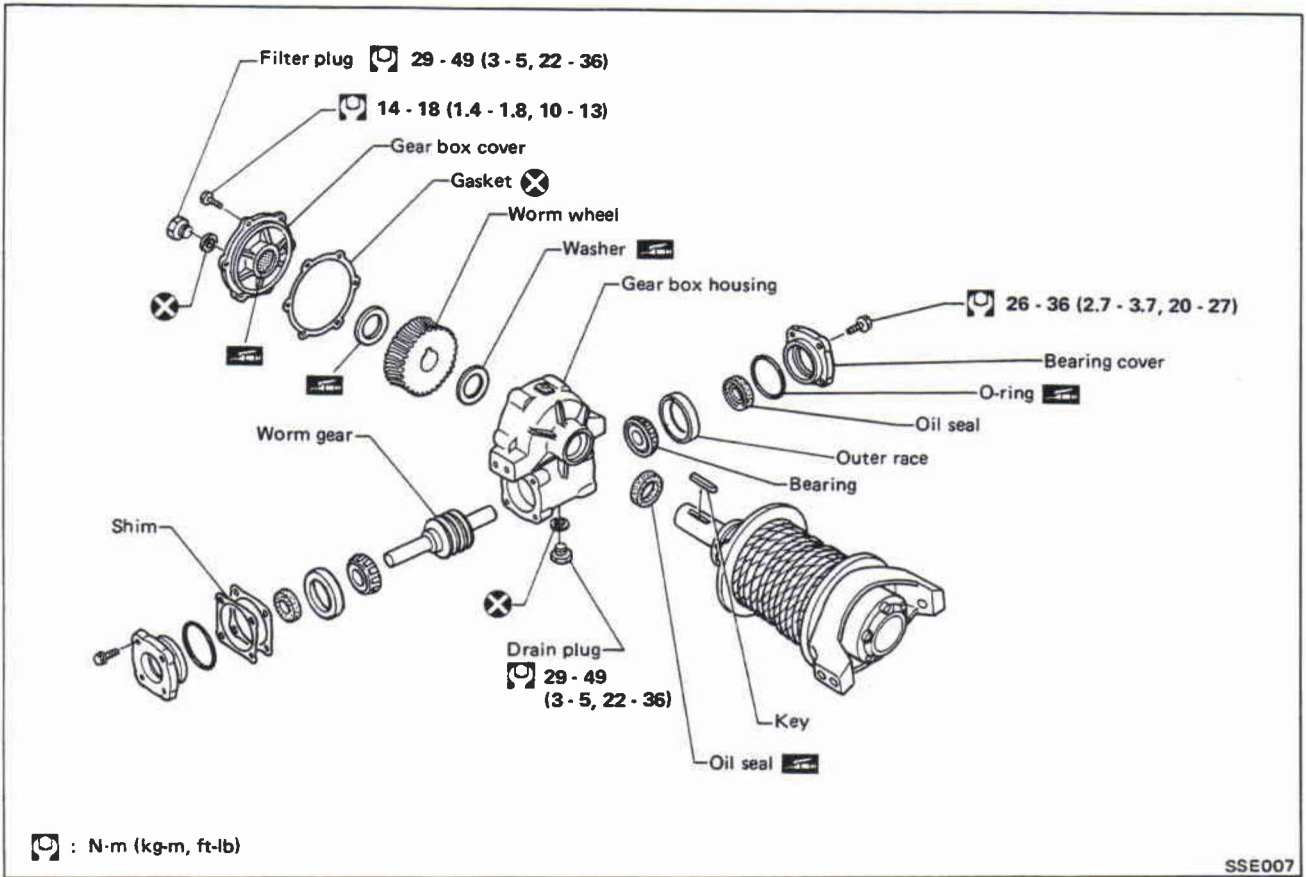
WINCH ASSEMBLY



Removal

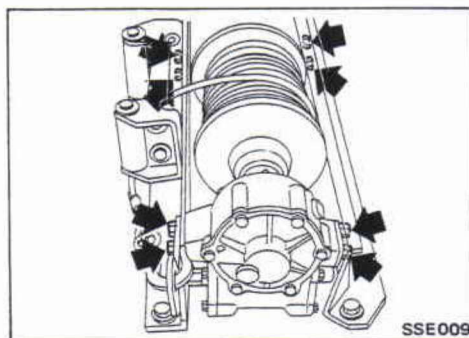
1. Remove shear pin with a suitable tool.
2. Remove bumper assembly.
Refer to BF section.

GEAR BOX ASSEMBLY



Disassembly

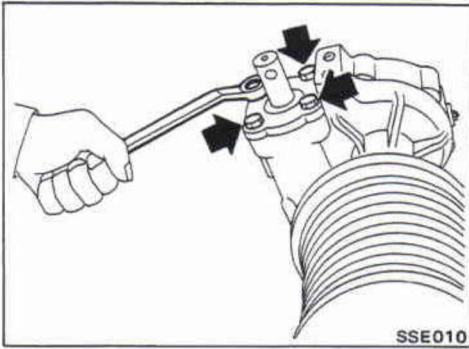
1. Drain gear box oil.



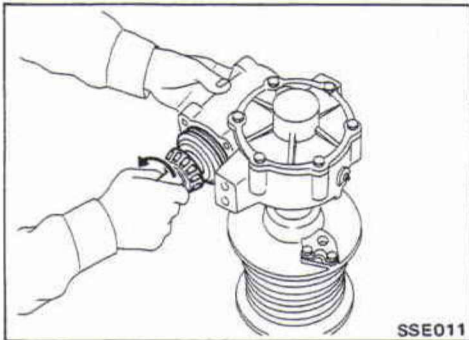
2. Remove support frame.

GEAR BOX ASSEMBLY

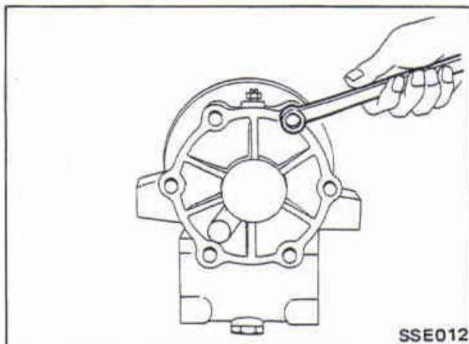
Disassembly (Cont'd)



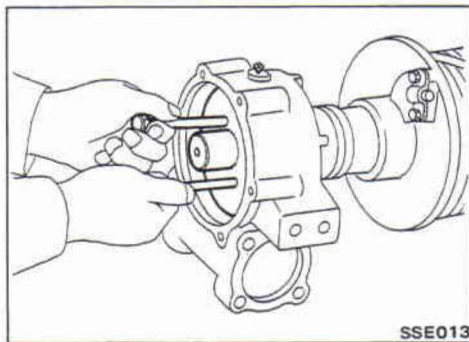
3. Remove both side bearing covers.



4. Turn worm gear counterclockwise to remove it.



5. Remove gear box cover.



6. Remove worm wheel, key and washer.

7. Remove gear box housing.

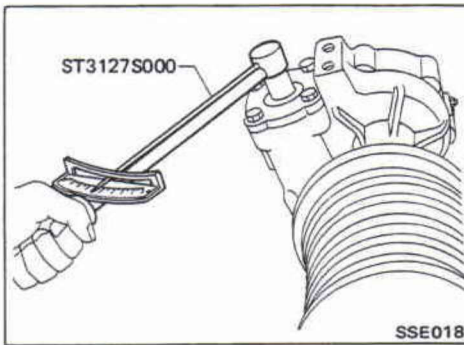
Inspection

Check the following parts for excessive wear, chips or cracks.

- Support frame
- Worm gear
- Gear box cover
- Bearing cover
- Gear box housing
- Oil seal

Replace if necessary.

GEAR BOX ASSEMBLY

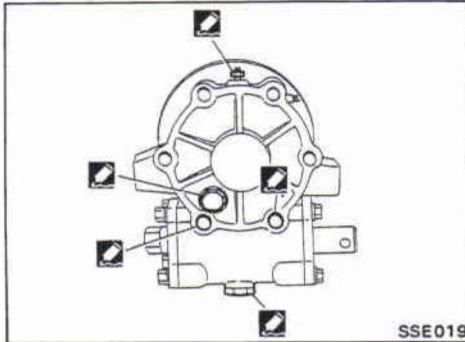


Assembly

1. After worm gear, bearings and bearing covers have been installed, check preload to determine the required number of shims to be used.

Turning torque:

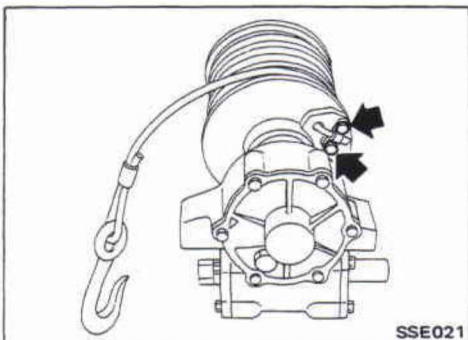
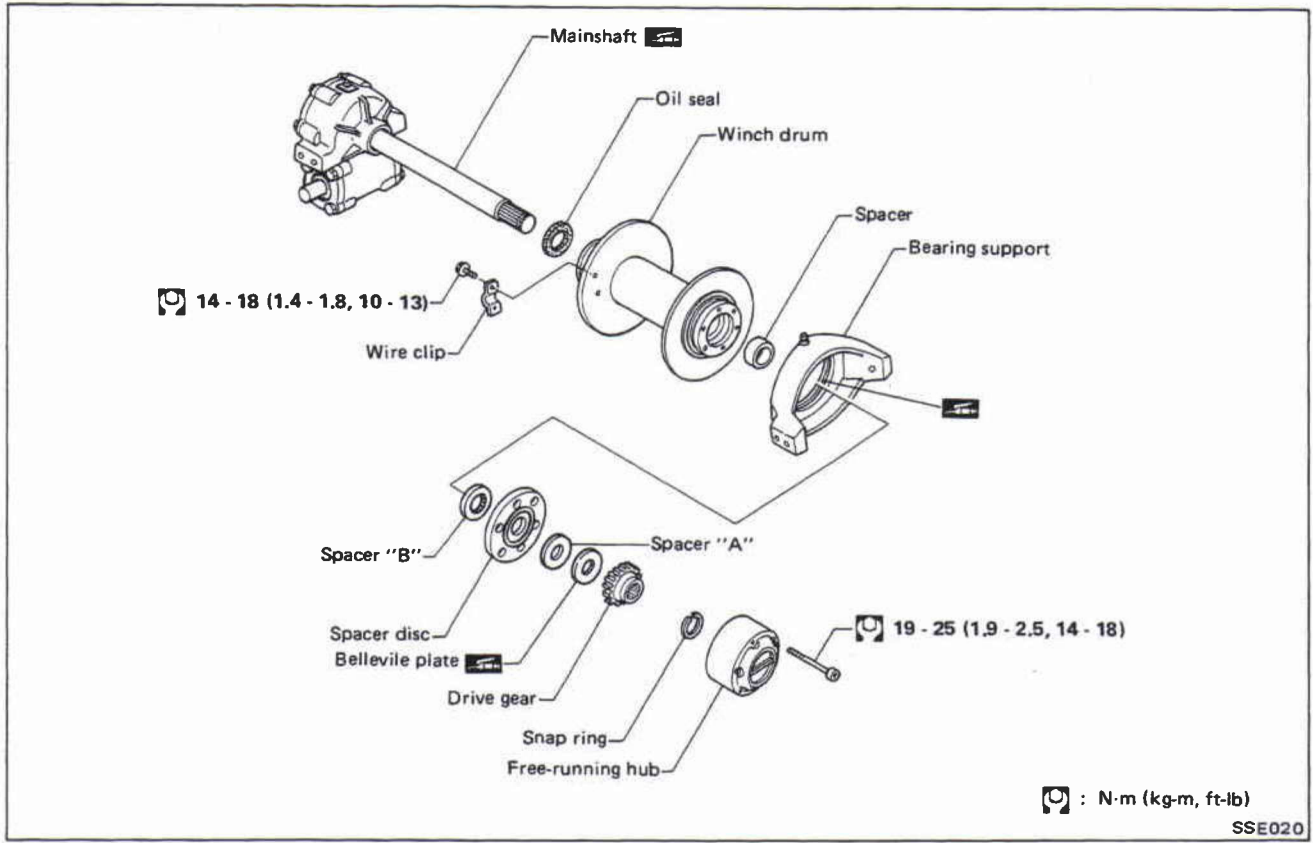
1 - 3 N·m (0.1 - 0.3 kg-m, 0.7 - 2.2 ft-lb)



2. Apply sealant to points indicated in the figure at left.

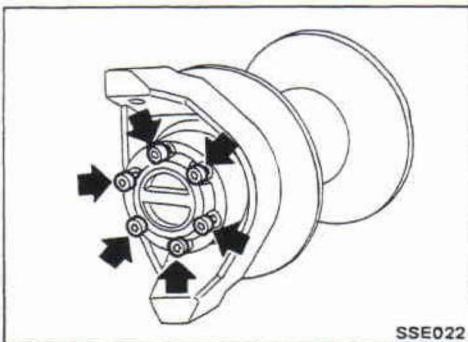
WINCH DRUM

Disassembly and Assembly



Disassembly

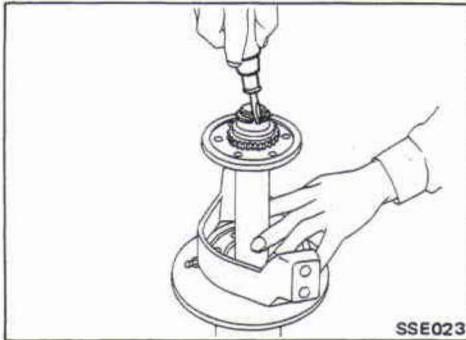
1. Remove wire (Free-running hub in "FREE" position).



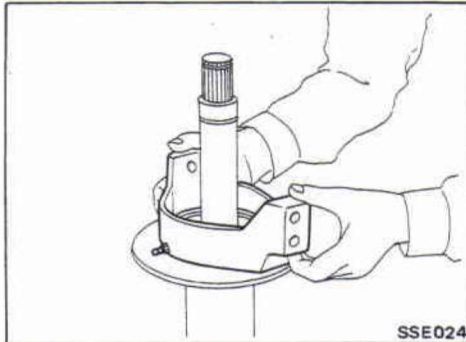
2. Remove free-running hub assembly.

WINCH DRUM

Disassembly (Cont'd)



3. Remove snap ring, drive gear and spacer "A".



4. Remove spacer disc and bearing support.

5. Remove spacer "B" and winch drum.

Inspection

Check the following parts for cracks and deformation.

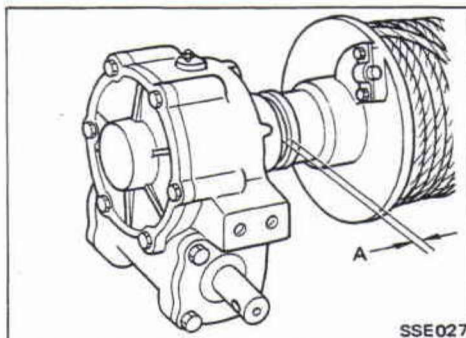
- Bearing support
- Winch drum
- Drive gear
- Free-running hub
- Wire
- Oil seal

Assembly

1. After winch drum has been installed, check clearance "A".

Clearance "A":

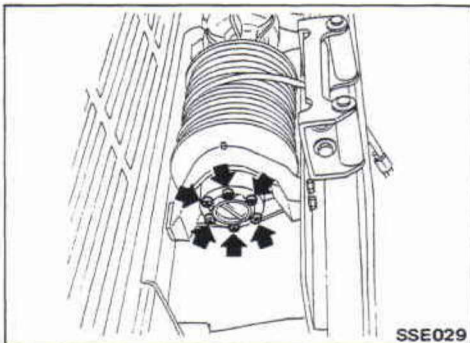
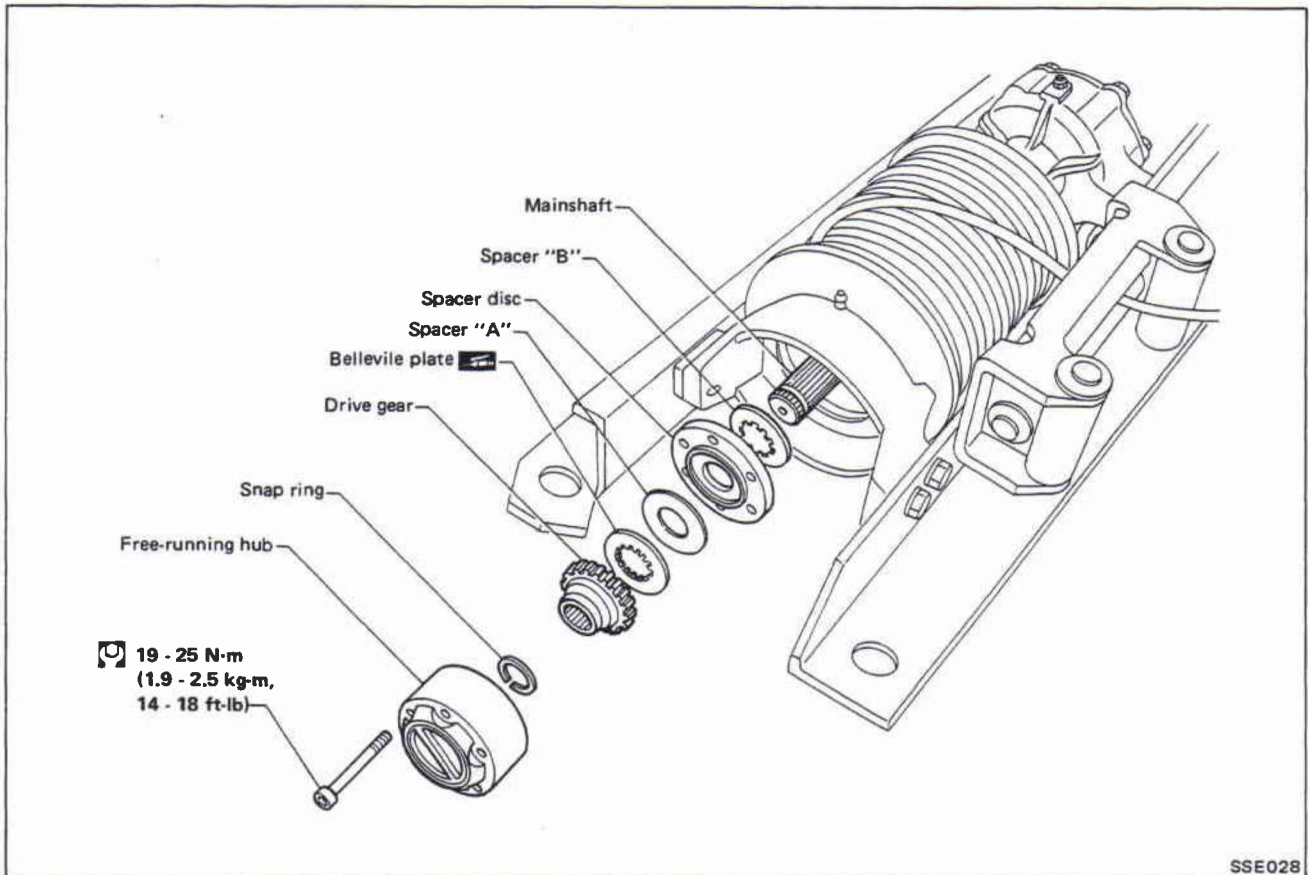
1 mm (0.04 in) or more



2. Make sure that winch drum and free-running hub knob rotate smoothly.

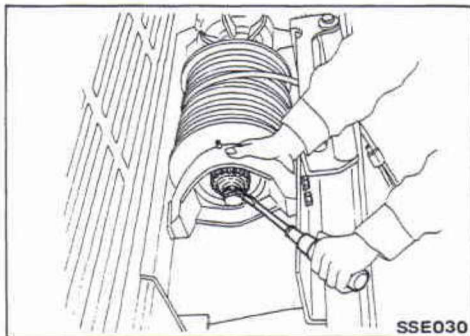
3. Always wind wire on the drum neatly.

FREE-RUNNING HUB



Removal

1. Remove free-running hub.



2. Remove snap ring and drive gear.

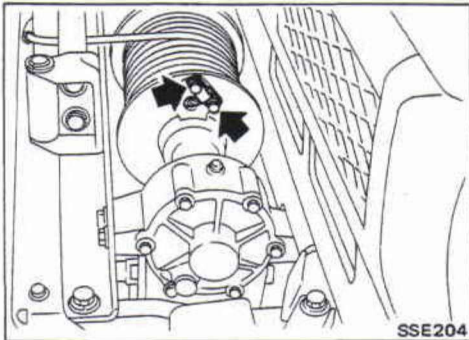
FREE-RUNNING HUB

Inspection

Check the following parts for excessive wear, chips or cracks.

- Free-running hub
- Drive gear

Replace if necessary.

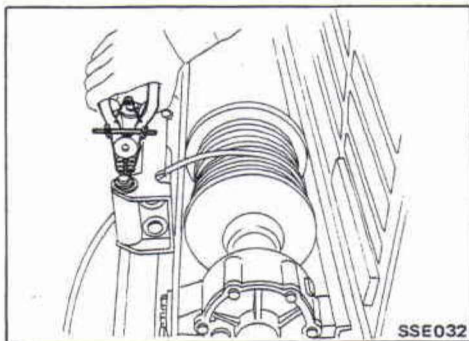


WIRE REPLACEMENT (On-vehicle)

1. Remove wire clamp and wire.

2. Install new wire.

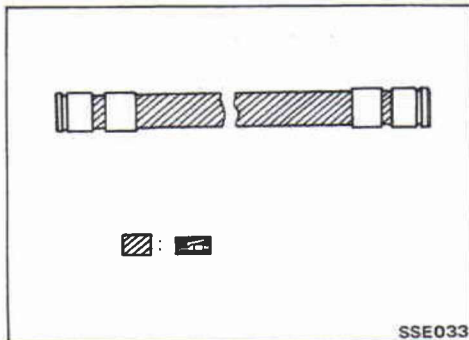
Always wind wire on the drum neatly.



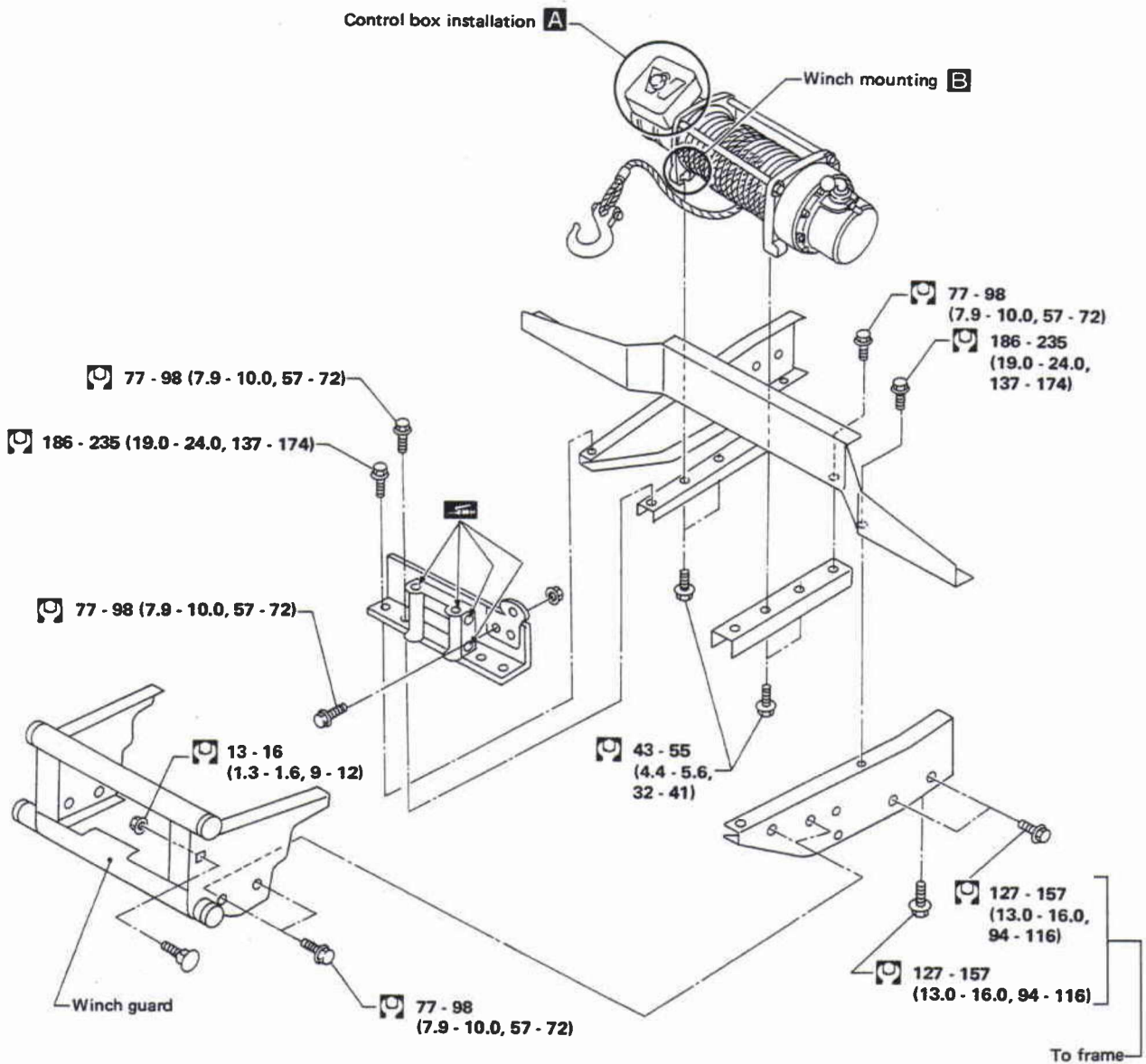
ROLLER REPLACEMENT (On-vehicle)

1. Remove roller shaft snap ring, then roller shaft and roller.

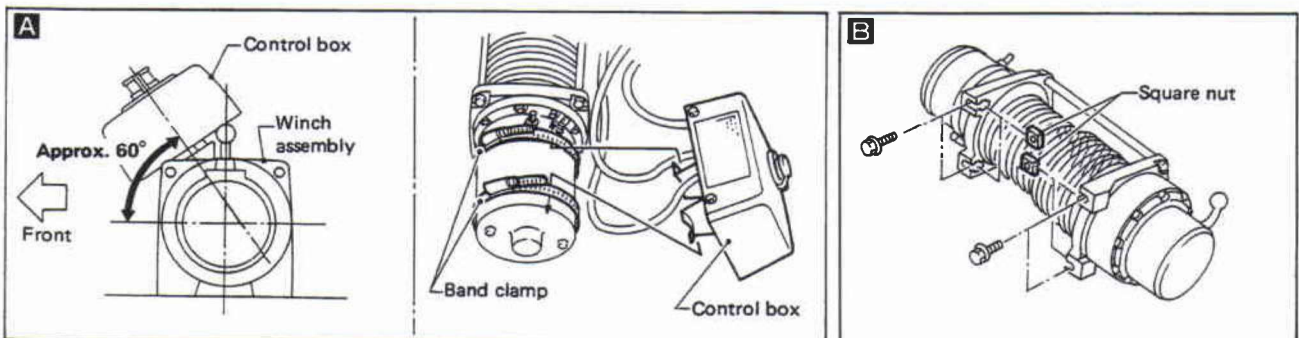
2. Apply grease to roller shaft surface.



ELECTRICAL WINCH



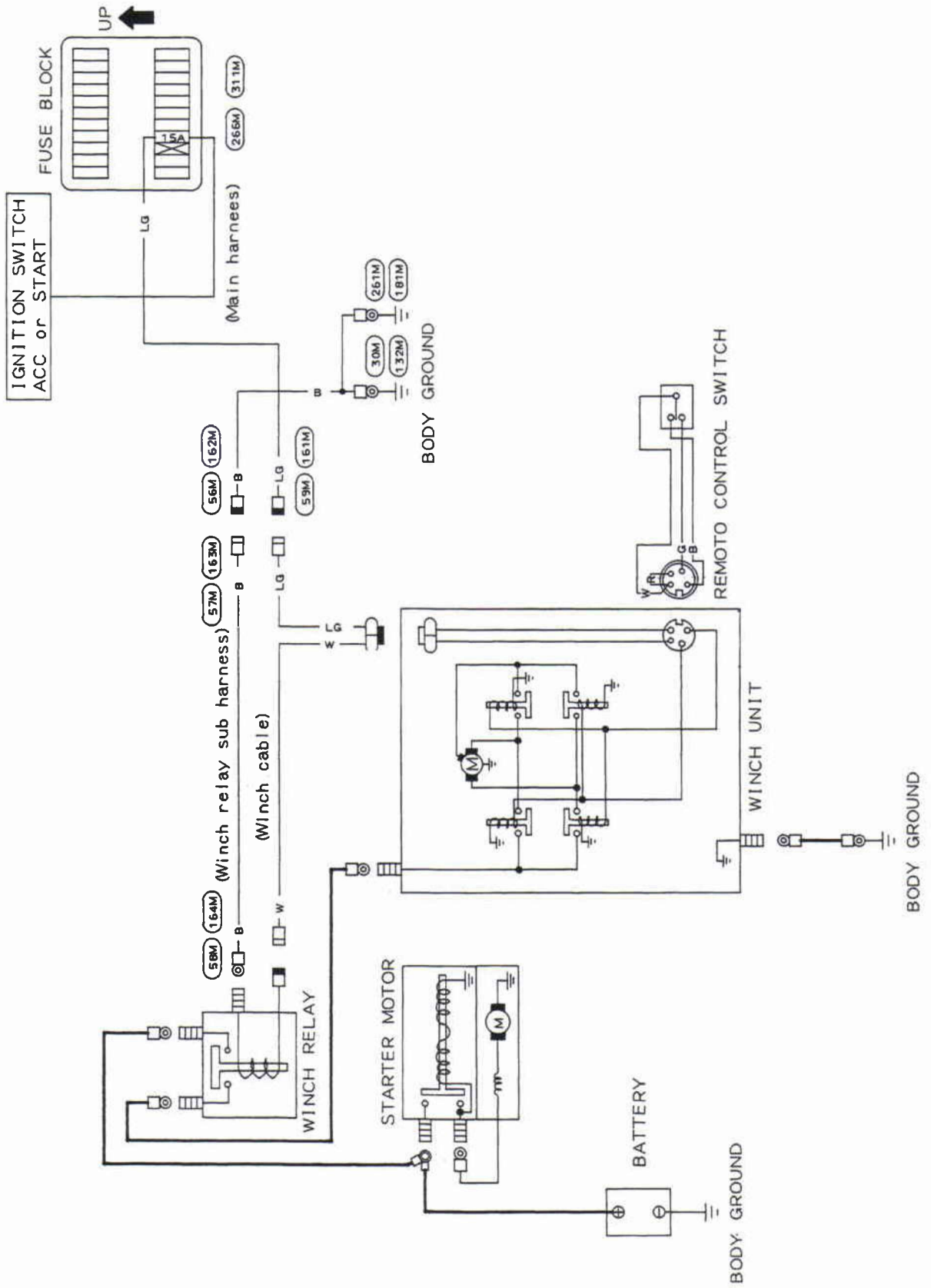
: N.m (kg-m, ft-lb)



SSE184

ELECTRICAL WINCH

Wiring Diagram



SERVICE DATA AND SPECIFICATIONS (S.D.S.)

General Specifications

POWER TAKE OFF

Gear ratio Forth	0.928
Reverse	1.185

WINCH SYSTEM (MECHANICAL)

Capacity	14,711 N (1,500 kg, 3,308 lb)
Wire size (diameter x length)	8 mm x 40 m (0.31 in x 131 ft)
Wire winding speed/ Engine speed	10 m (33 ft)/min./ 1,000 rpm
Type of winch oil	Mobile cylinder oil 600W or equivalent
Oil capacity	0.4ℓ (3/4 Imp pt)

WINCH SYSTEM (ELECTRICAL)

Capacity	9,807 N (1,000 kg, 2,205 lb)
Time limit	2.5 sec.
Wire winding speed	6.6 m (21.7 ft)/min.
Wire size (diameter x length)	8 mm x 24 m (0.31 in x 79 ft)

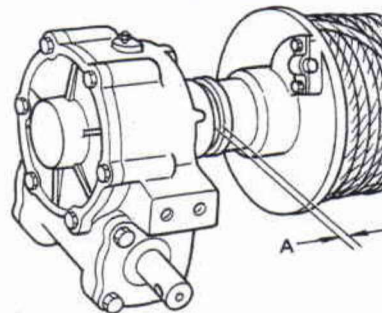
Inspection and Adjustment

POWER TAKE OFF

End play	mm (in)	
Reverse gear		0.02 - 0.50 (0.0008 - 0.0197)
Idler gear		0.02 - 0.50 (0.0008 - 0.0197)

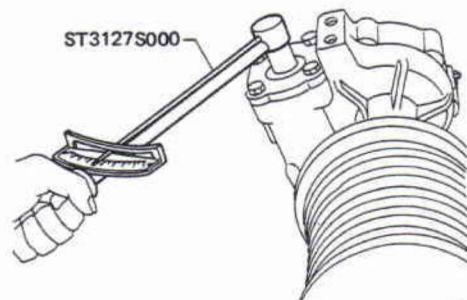
WINCH ASSEMBLY

Winch drum and gear box clearance	1 mm (0.04 in) or more
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SSE027

Worm gear turning torque	1 - 3 N·m (0.1 - 0.3 kg·m, 0.7 - 2.2 ft-lb)
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SSE018