
MANUAL TRANSMISSION AND CLUTCH MSB SERIES

SECTION 7C
CLUTCH

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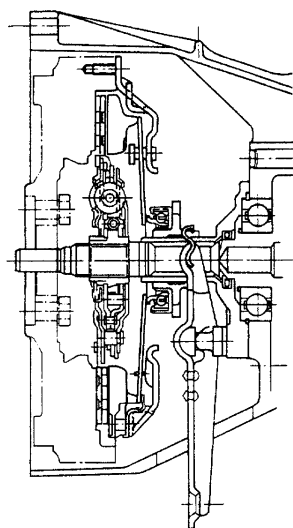
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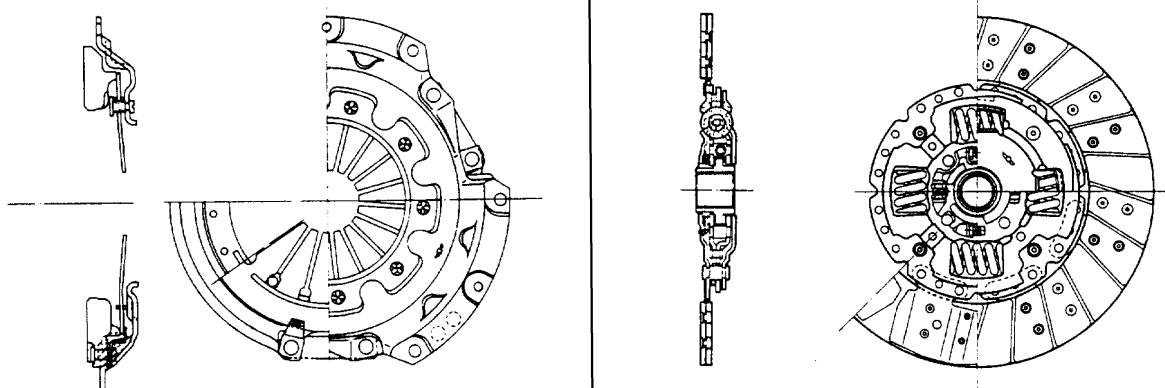
GENERAL DESCRIPTION

Clutch Assembly

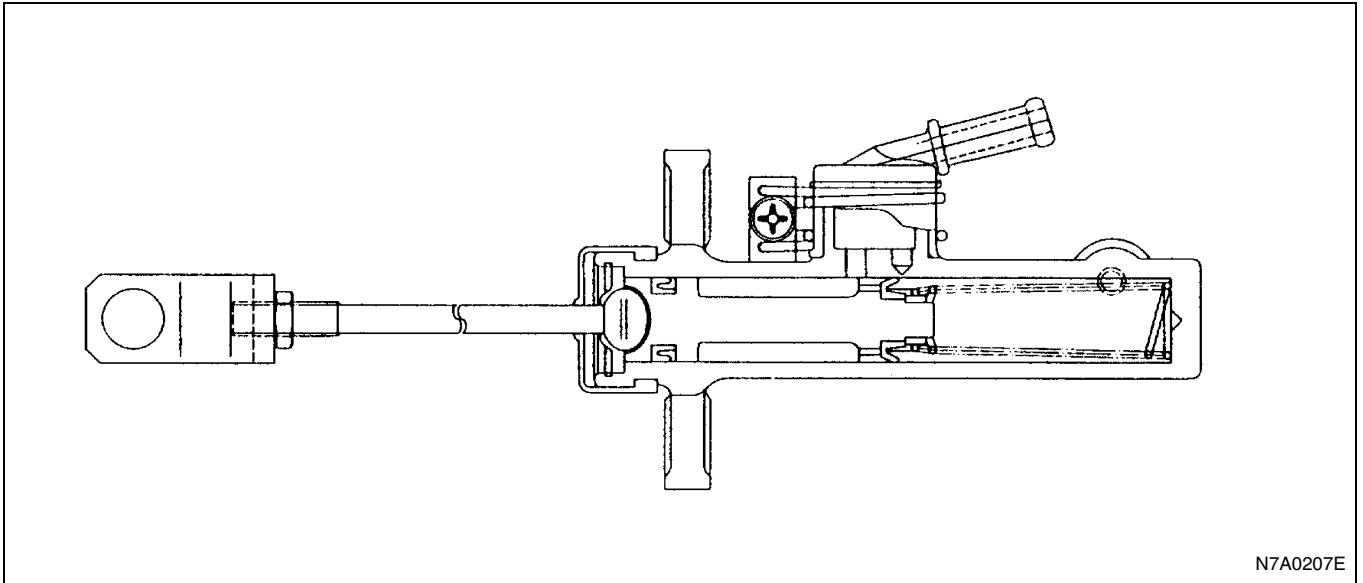
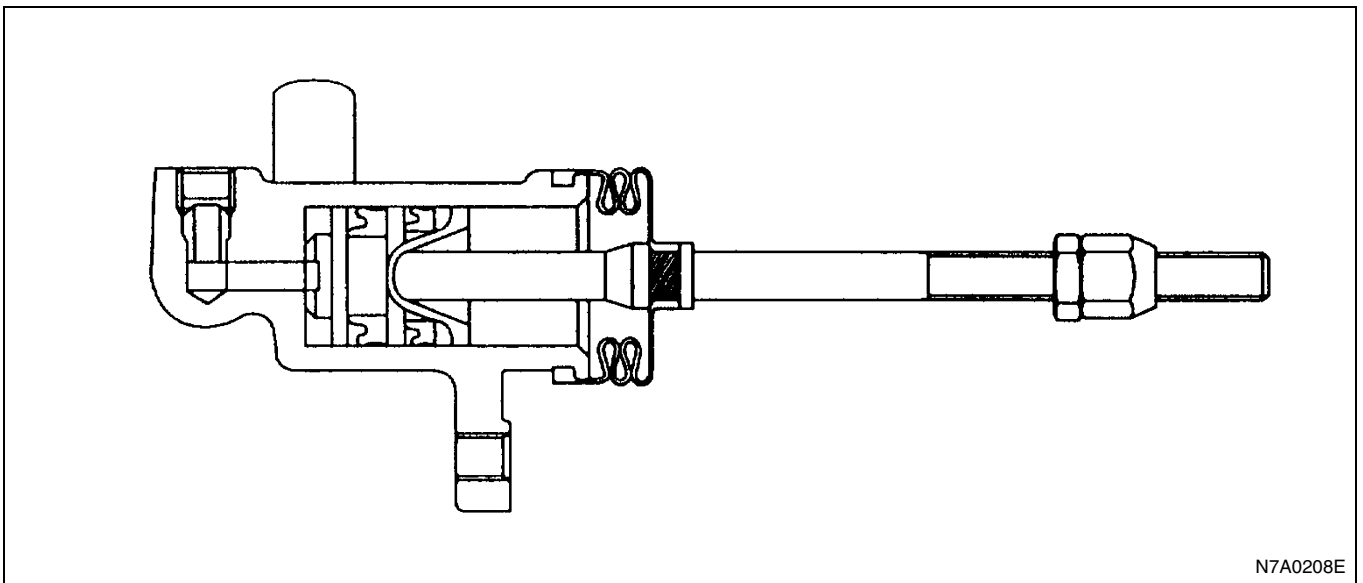


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Pressure Plate Assembly and Driven Plate Assembly

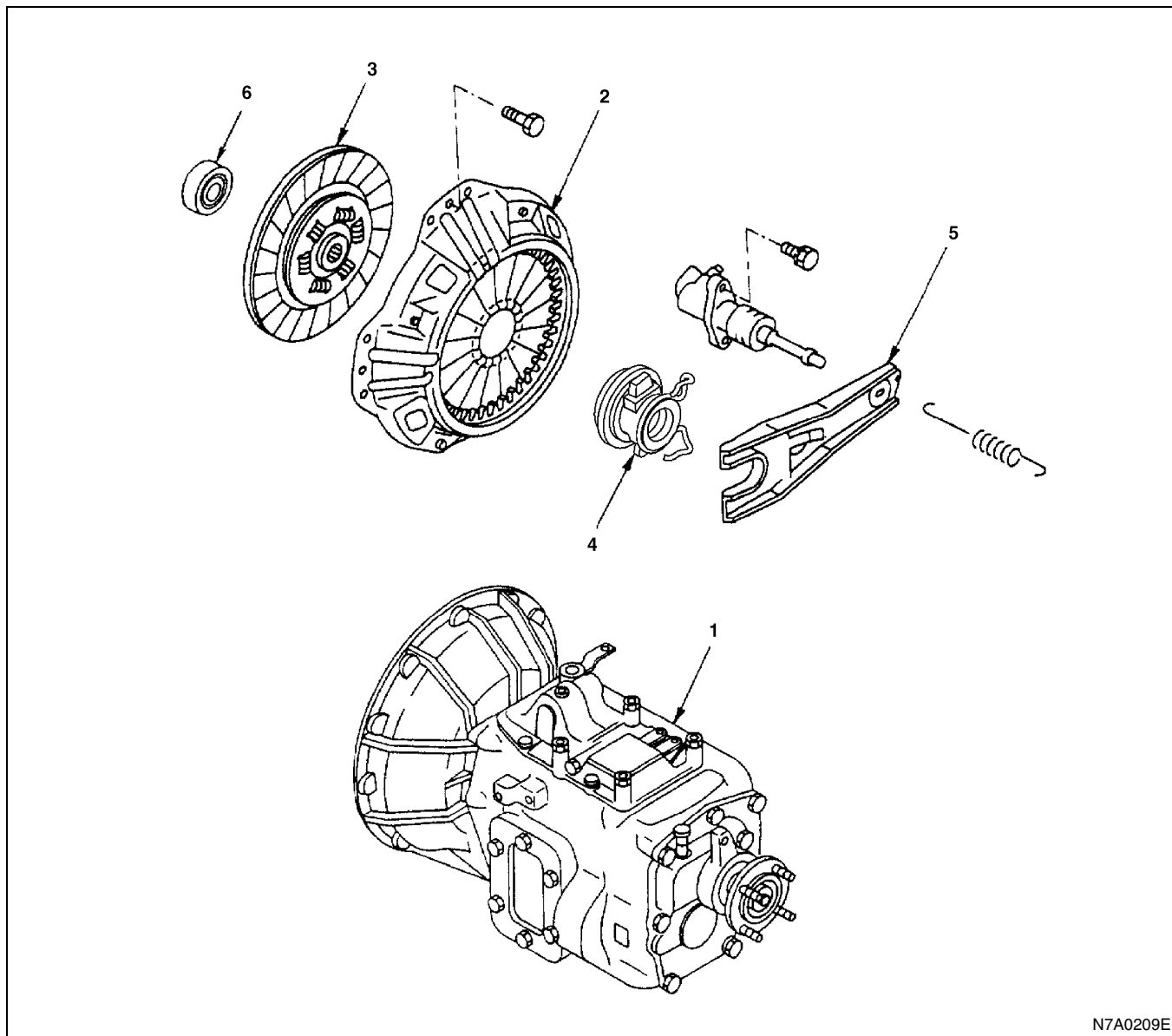


N7A0206E

Master Cylinder**Slave Cylinder**

ON-VEHICLE SERVICE

Clutch Assembly



N7A0209E

Legend

- | | |
|----------------------------|-----------------------------|
| 1. Transmission assembly | 4. Release bearing assembly |
| 2. Pressure plate assembly | 5. Shift fork |
| 3. Driven plate assembly | 6. Pilot bearing |

Removal

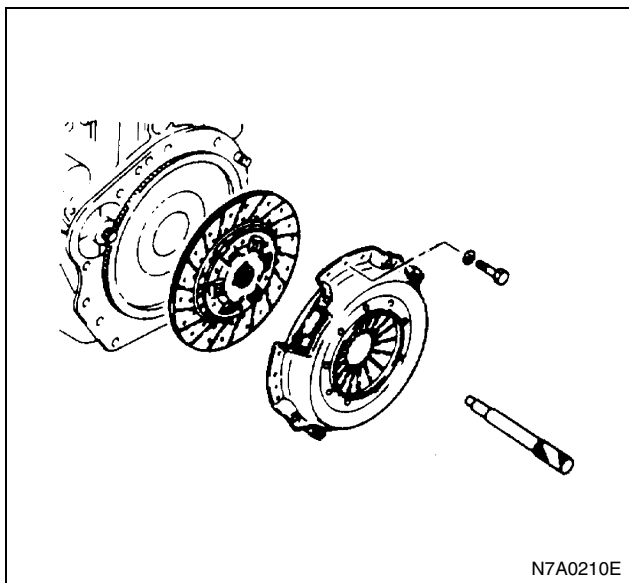
- Raise vehicle and support with suitable safety stands.

Caution:

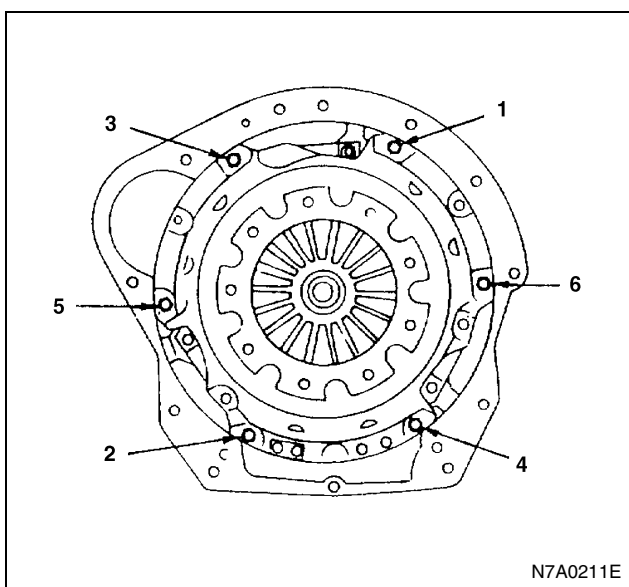
Do not let clutch fluid remain on a painted surface. Wash it off immediately.

1. Transmission Assembly
Refer to "SECTION 7B ON-VEHICLE SERVICE: TRANSMISSION ASSEMBLY REPLACEMENT" in this manual.

2. Pressure Plate Assembly
3. Driven Plate Assembly
 - Use the pilot aligner to prevent the driven plate assembly from falling free.
Pilot Aligner: 5-8525-3001-0
 - Mark the flywheel and pressure plate lug for alignment when installing.



- Loosen the pressure plate assembly fixing bolts in the numerical order shown in the illustration.

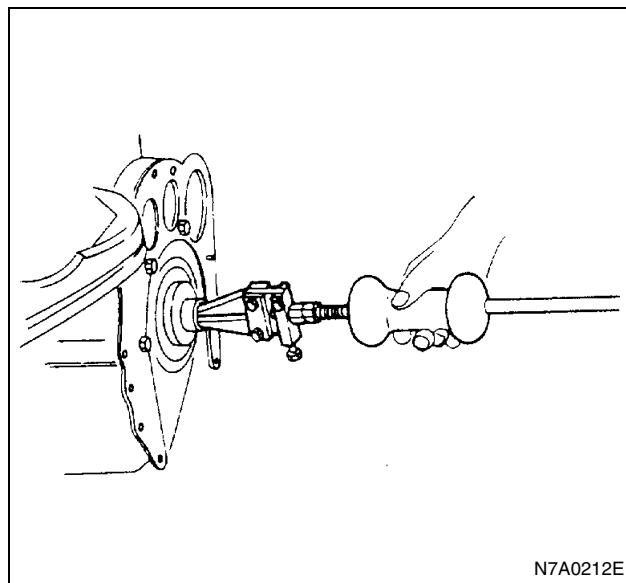


4. Release Bearing Assembly
5. Shift Fork
6. Pilot Bearing

Notice:

Do not remove pilot bearing unless absolutely necessary.

- Use the pilot bearing remover to remove the pilot bearing.
Pilot Bearing Remover: 5-8840-2000-0
Sliding Hammer: 5-8840-0084-0

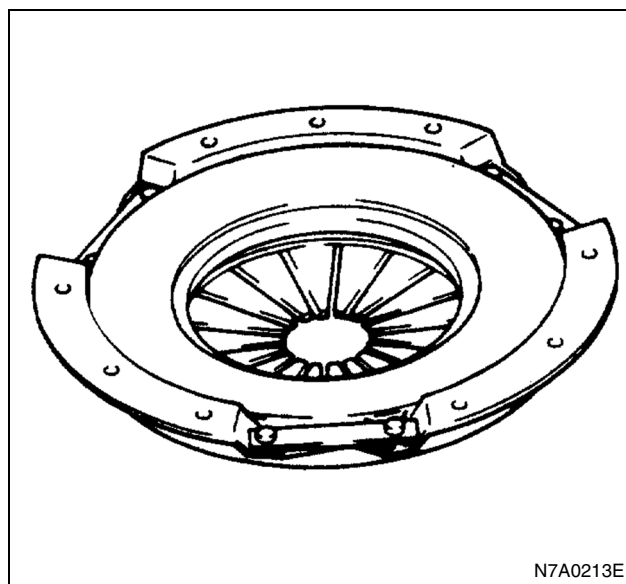


Inspection and Repair

Make the necessary adjustments, repairs, and part replacement if excessive wear or damage is discovered during inspection.

Pressure Plate Assembly

- Visually inspect the pressure plate friction surface for excessive wear and heat cracks. If excessive wear or deep heat cracks are present, the pressure plate assembly must be replaced.

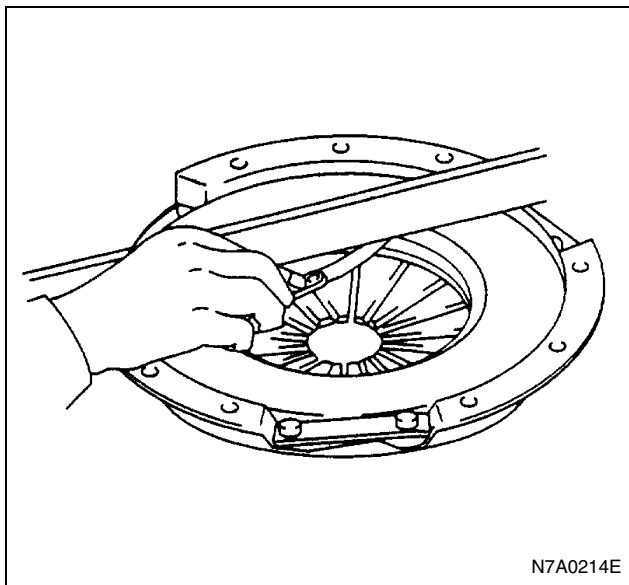


Pressure Plate Warpage

- Use a straight edge and a feeler gauge to measure the pressure plate friction surface flatness in four directions.
If any of the measured values exceed the specified limit, the pressure plate assembly must be replaced.

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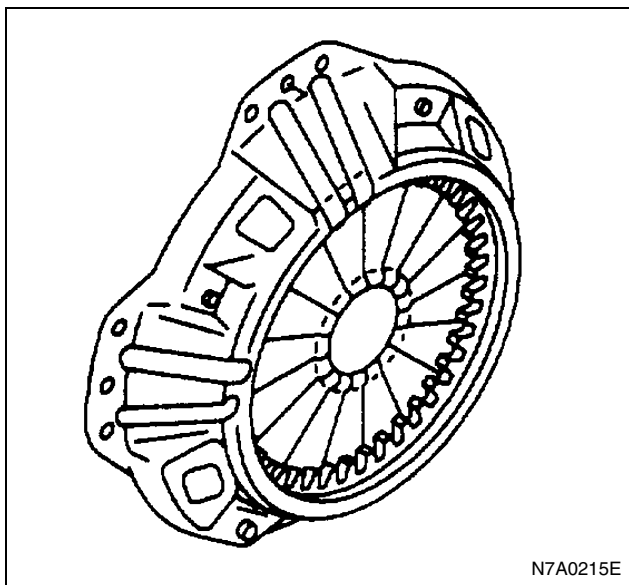
Pressure Plate Warpage	mm (in)
Limit	
0.3 (0.01)	



N7A0214E

Clutch Cover

- Visually inspect the entire clutch cover for excessive wear, cracking, and other damage. The pressure plate assembly must be replaced if any of these conditions are present.

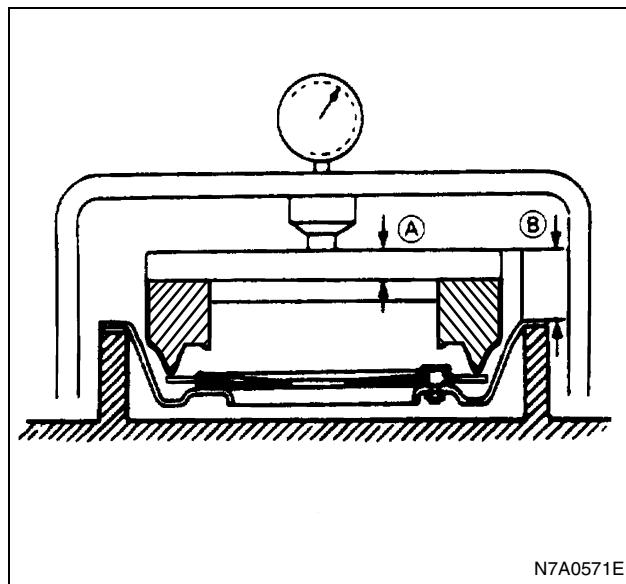


N7A0215E

Clutch Set Force

- Invert the pressure plate assembly.
- Place a metal sheet with thickness "A" on the pressure plate.
- Compress the pressure plate assembly until the distance "B" becomes specified.

Thickness and Distance	mm (in)	
	A	B
NKR55 Clutch Size ϕ 240	7.4 (0.29)	18 (0.71)
NHR55/NKR55/NHR69 Clutch Size ϕ 250	8.0 (0.31)	18 (0.71)



N7A0571E

- Note the pressure plate gauge reading.

Clutch Set Force	N (kg/lb)	
	Standard	Limit
NKR55 Clutch Size ϕ 240	4,116 (420/926)	3,785 (386/851)
NHR55/NKR55/NHR69 Clutch Size ϕ 250	6,276 (640/1,411)	5,776 (589/1,299)

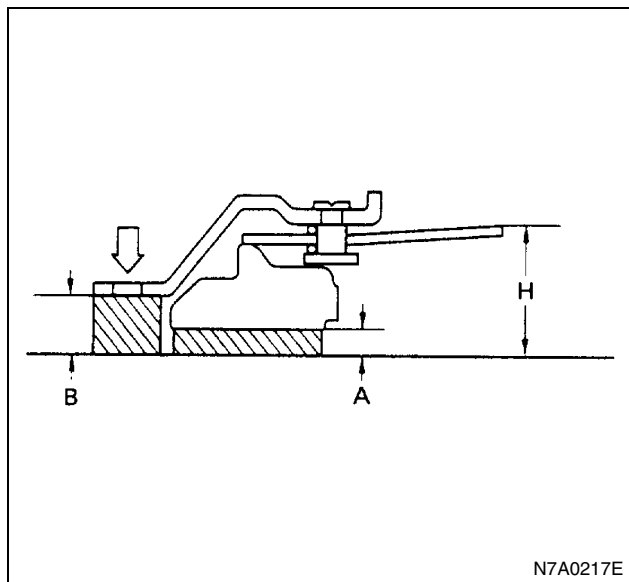
Diaphragm Spring Finger Height

- Place distance pieces beneath the pressure plate and clutch cover.

Distance Piece	mm (in)	
	A	B
NKR55 Clutch Size ϕ 240	7.4 (0.29)	18 (0.71)
NHR55/NKR55/NHR69 Clutch Size ϕ 250	8.0 (0.31)	18 (0.71)

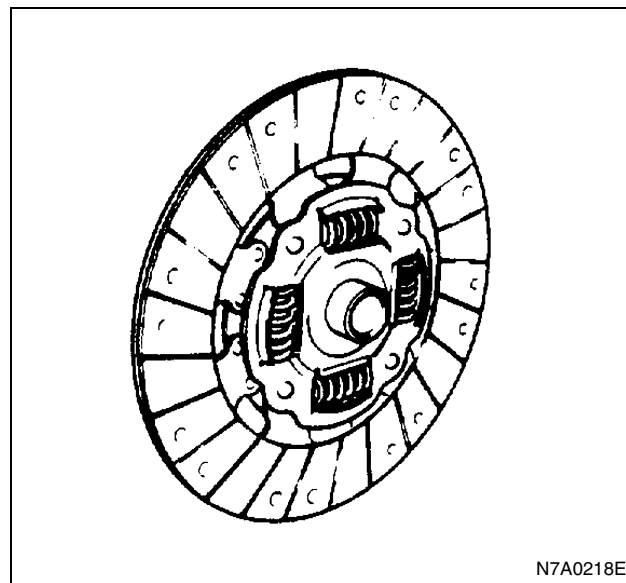
- Fully compress the pressure plate assembly. There are two ways to do this.
 - Use a bench press to press down on the pressure plate assembly from the top.
 - Tighten the pressure plate assembly fixing bolts.
- Measure the spring finger height from base to spring tip.

Spring Finger Height (H) mm (in)	
	Standard
NKR55 Clutch Size ϕ 240	40.7 — 42.7 (1.60 — 1.68)
NHR55/NKR55/NHR69 Clutch Size ϕ 250	39.0 — 41.0 (1.54 — 1.61)



Driven Plate Assembly

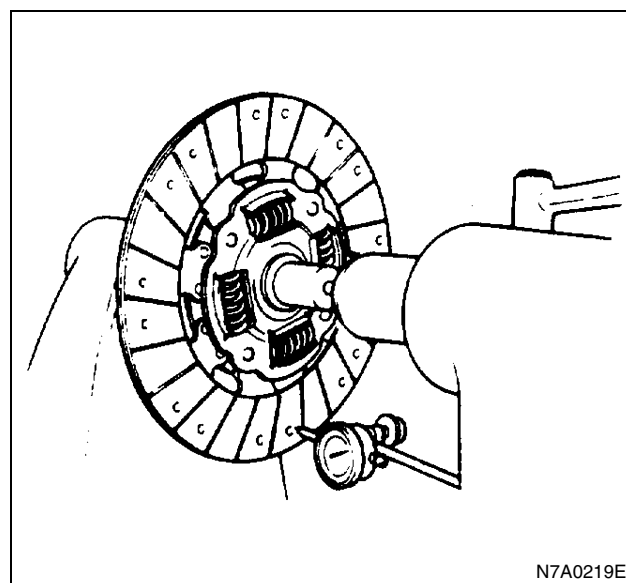
- Visually inspect the torsion spring for looseness, breakage, and weakening. If any of these conditions are discovered, the driven plate assembly must be replaced.
- Visually inspect the facing surfaces for cracking and excessive scorching. Visually inspect the facing surfaces for the presence of oil or grease. If any of these conditions are discovered, the facing must be cleaned or the driven plate assembly replaced.
- Check that the driven plate moves smoothly on the transmission top gear shaft spline. Minor ridges on the top gear shaft spline may be removed with an oil stone or pencil grinder.



Driven Plate Warpage

- Insert the pilot aligner into the driven plate spline hub. The pilot aligner must be held perfectly horizontal. Pilot Aligner: 5-8525-3001-0
- Set a dial indicator to the driven plate outside circumference.
- Slowly turn the driven plate. Read the dial indicator as you turn the driven plate. If the measured value exceeds the specified limit, the driven plate assembly must be replaced.

Driven Plate Warpage mm (in)	
Standard	Limit
Less than 0.7 (0.03)	1.0 (0.04)

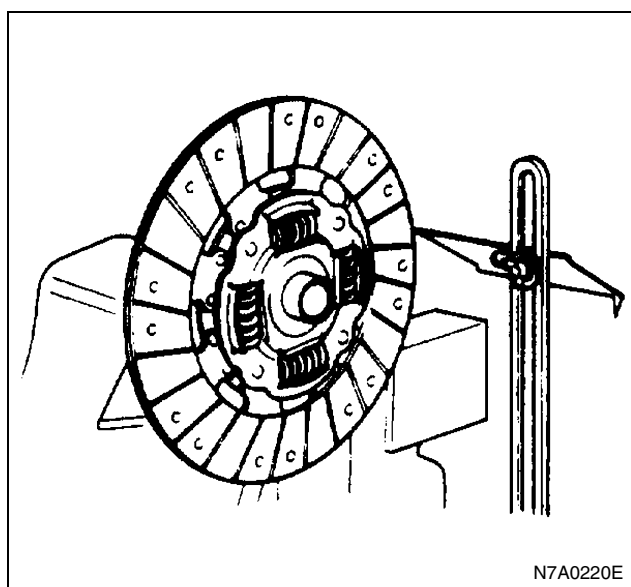


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Driven Plate Splined Hub Spline Wear

- Clean the driven plate splined hub.
- Install the driven plate to the transmission top gear shaft spline.
- Set a surface gauge to the driven plate outside circumference.
- Slowly turn the driven plate. Measure the spline rotation play as you turn the driven plate. If the measured value exceeds the specified limit, the driven plate assembly must be replaced.

Driven Plate Splined Hub Spline Wear		mm (in)
Standard	Limit	
Less than 0.5 (0.02)	1.0 (0.04)	

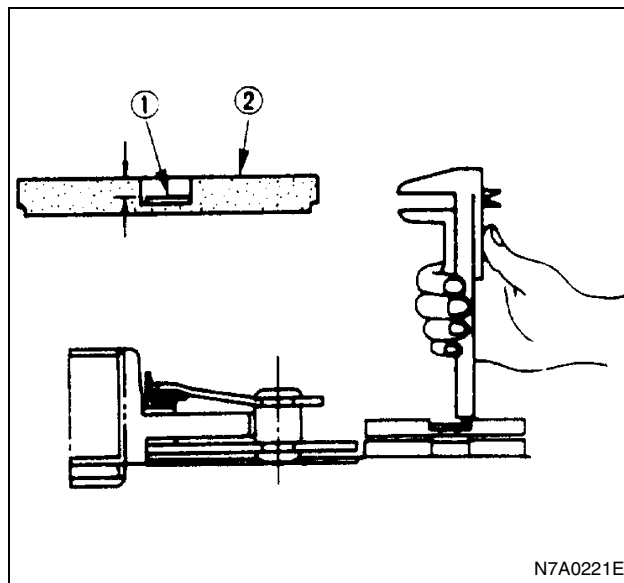


N7A0220E

Driven Plate Rivet Head Depression

- Use the depth gauge or a straight edge with steel rule to measure the rivet head depression (1) from the facing surface (2). Be sure to measure the rivet head depression (1) on both sides of the driven plate (2). If the measured value is less than the specified limit, the driven plate must be replaced.

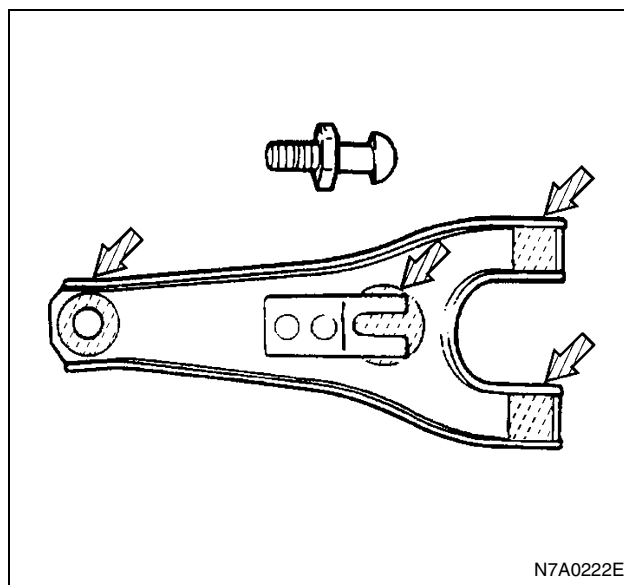
Rivet Head Depression		mm (in)
	Standard	Limit
NKR55 Clutch Size ϕ 240	1.1 — 1.7 (0.04 — 0.07)	0.2 (0.01)
NHR55/NKR55/NHR69 Clutch Size ϕ 250	1.65 — 2.25 (0.06 — 0.09)	0.2 (0.01)



N7A0221E

Shift Fork and Support Bolt

- Visually inspect the surfaces of the shift fork making contact with the shift block (release bearing) and support bolt.
- Correct a slight stepped wear or surface roughness with an oil stone or pencil grinder, or replace the shift fork and/or support bolt if unrecoverable damage is found.
- Apply multi-purpose with MOS₂ type grease.



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Release Bearing Assembly

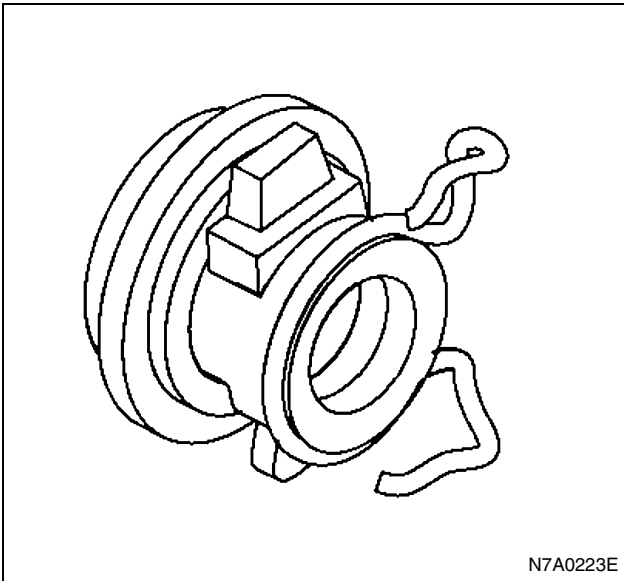
- Visually inspect the release bearing assembly for breakage and weakening.
- If any of these conditions are discovered, release bearing assembly must be replaced.

Caution:

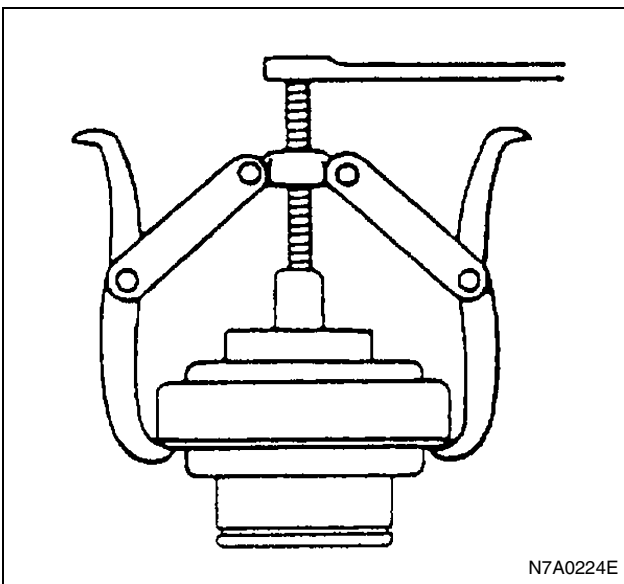
The release bearing is permanently packed with lubricant and should not be soaked in cleaning solvent, as this will dissolve the lubricant.

Notice:

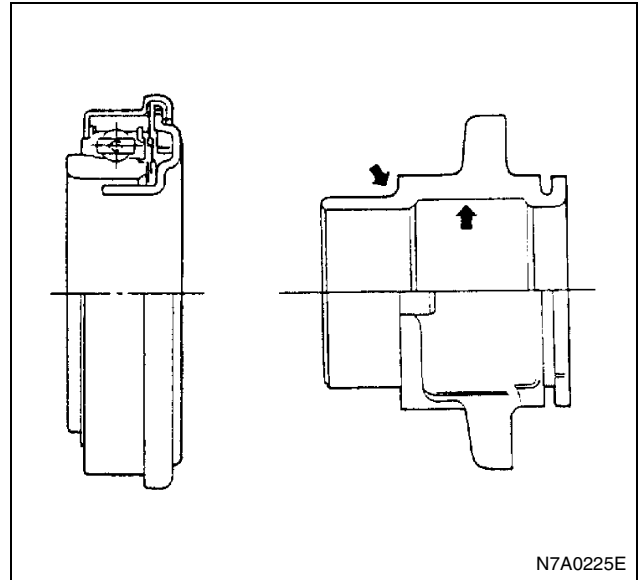
Do not disassemble the shift block assembly if no fault is apparent.



- Use the bearing remover and bench press to remove the release bearing.
Bearing Remover: 5-8840-0013-0



- Install the parts as shown after applying multi-purpose with MOS₂ type grease. Use a bench press.

**Support Spring**

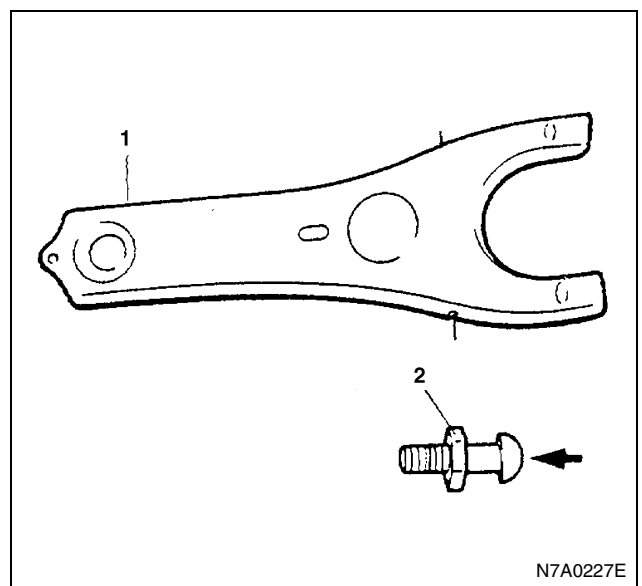
- Visually inspect the support spring for breakage and weakening.
- If any of these condition are discovered, parts must be replaced.

Installation**1. Pilot Bearing**

- Use the pilot bearing installer to install the clutch pilot bearing.
Pilot Bearing Installer: 5-8522-0024-0

2. Shift Fork

- Apply multi-purpose with MOS₂ type grease to the contact surfaces with the shift block and support bolt head.



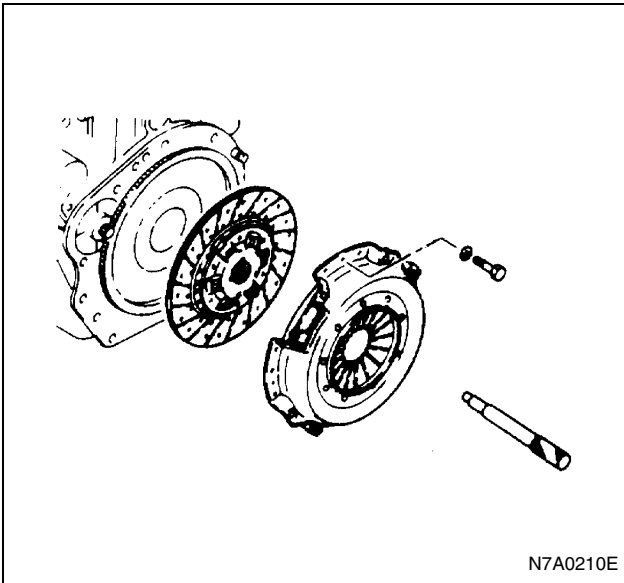
Legend

1. Shift fork
2. Support bolt

3. Release Bearing Assembly

4. Driven Plate Assembly

- Apply multi-purpose with MOS_2 type grease to the driven plate hub spline.
- Use the pilot aligner to install the driven plate assembly.
Pilot Aligner: 5-8525-3001-0



5. Pressure Plate Assembly

- Tighten pressure plate assembly fixing bolts in numerical order.

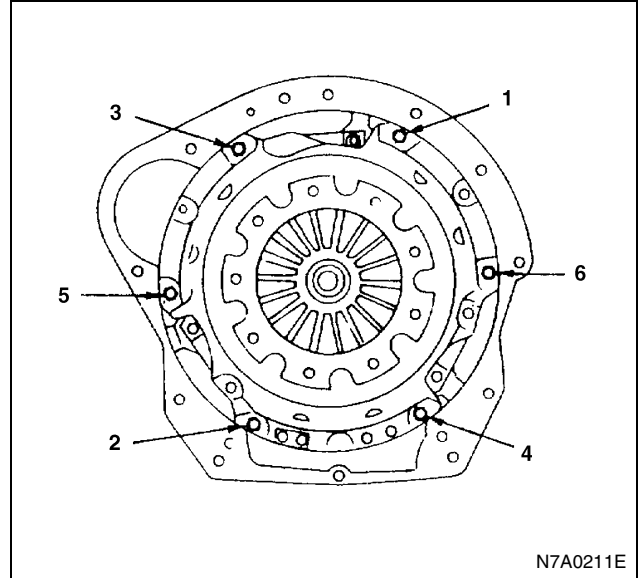
Tighten:

Pressure plate fixing bolt to 18 N·m (1.8 kg·m / 13 lb·ft)

- Remove the pilot aligner.

Notice:

In case a new pressure plate assembly is mounted, after tightening a pressure plate to the specified torque, be sure to remove the wire for protection of a diaphragm spring.



6. Transmission Assembly

Refer to "SECTION 7B ON-VEHICLE SERVICE: TRANSMISSION ASSEMBLY REPLACEMENT" in this manual.

Tighten:

Clutch housing to flywheel housing bolts to

- M10: 46 N·m (4.7 kg·m / 34 lb·ft)
- M12: 91 N·m (9.3 kg·m / 67 lb·ft)

Tighten:

Engine rear mounting nuts and bolts to

- M10: 40 N·m (4.1 kg·m / 30 lb·ft)
- M12: 69 N·m (7.0 kg·m / 51 lb·ft)

Tighten:

Front exhaust pipe bolts to 37 N·m (3.8 kg·m / 27 lb·ft)

Tighten:

Exhaust brake bolts to 17 N·m (1.7 kg·m / 12 lb·ft)

Tighten:

Slave cylinder bolts to 16 N·m (1.6 kg·m / 12 lb·ft)

Perform slave cylinder adjustment before installation of the return spring.

- 1) Loosen the lock nut of the push rod.
- 2) Turn the adjust nut until it reaches the shift fork.
- 3) Back off the adjust nut 1.5 turns (shift fork free play Approximately 2 mm/0.1 in).
- 4) Tighten the lock nut.

Tighten:

Push rod lock nut to 19 N·m (1.9 kg·m / 14 lb·ft)

Wiring Connector Color

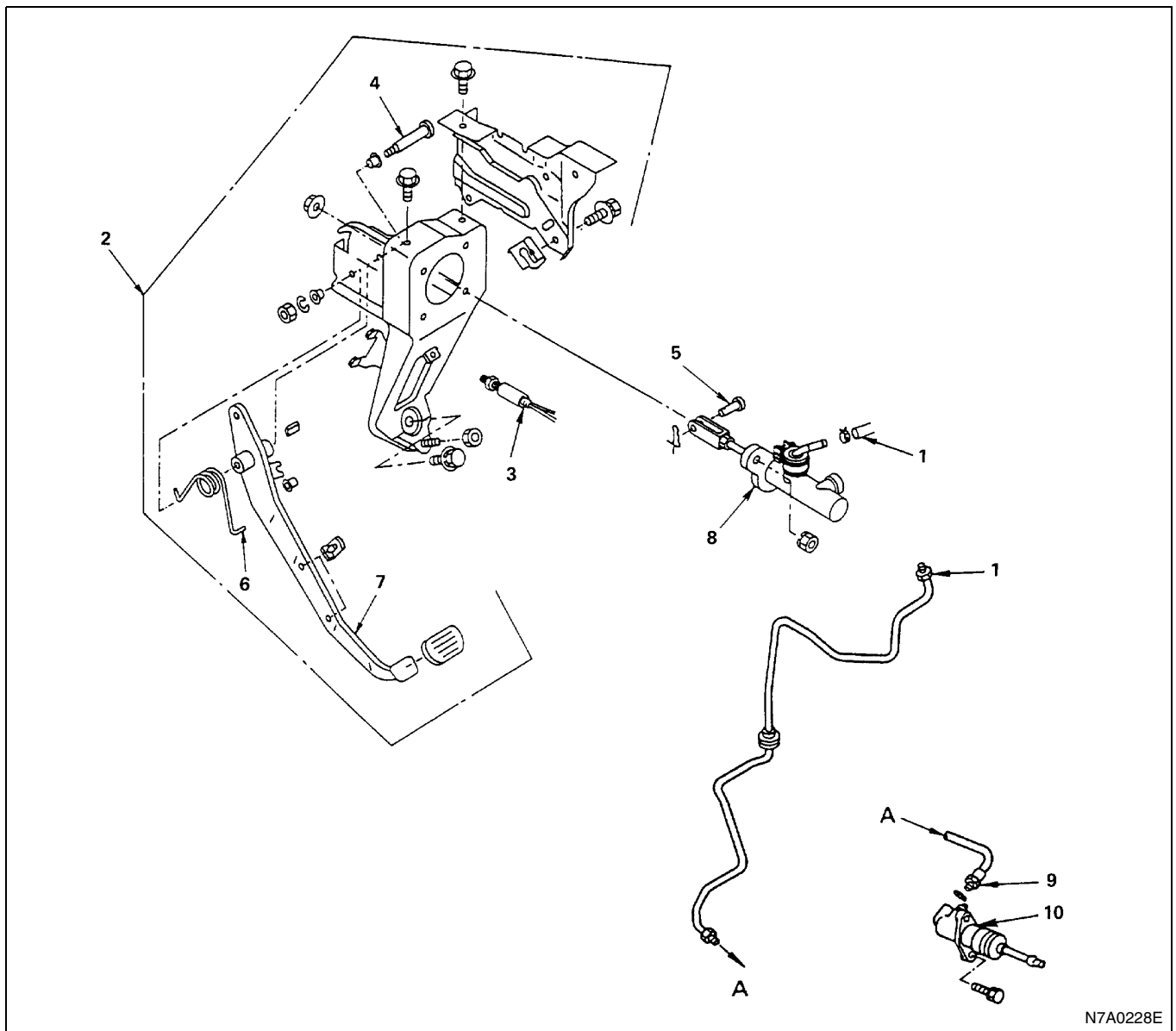
Back-up Light Switch: Brown

Neutral Switch: Gray

Tighten:

Propeller shaft nuts to 66 N·m (6.7 kg·m / 48 lb·ft)

Clutch Control



N7A0228E

Legend

- | | |
|--------------------------------------|--------------------|
| 1. Clutch pipe and hose | 6. Return spring |
| 2. Clutch pedal and bracket assembly | 7. Clutch pedal |
| 3. Clutch switch or stopper bolt | 8. Master cylinder |
| 4. Shaft | 9. Flexible hose |
| 5. Clevis pin | 10. Slave cylinder |

Preparation

1. Meter Cluster
 - Pull out the meter cluster and disconnect the harness connectors.
2. Meter Assembly
 - Remove the 5 fixing screws, then remove the meter assembly and disconnect the harness connector.

Removal

- Drain the clutch fluid from the clutch hydraulic line.

Caution:

Do not let clutch fluid remain on a painted surface. Wash it off immediately.

1. Clutch Pipe and Hose
2. Clutch Pedal and Bracket Assembly
3. Clutch Switch or Stopper Bolt
4. Shaft

7C-12 CLUTCH

5. Clevis Pin
6. Return Spring
7. Clutch Pedal
8. Master Cylinder
9. Flexible Hose
10. Slave Cylinder

Inspection and Repair

Make the necessary adjustment, repairs, and part replacement if excessive wear or damage is discovered during inspection.

Installation

1. Slave Cylinder

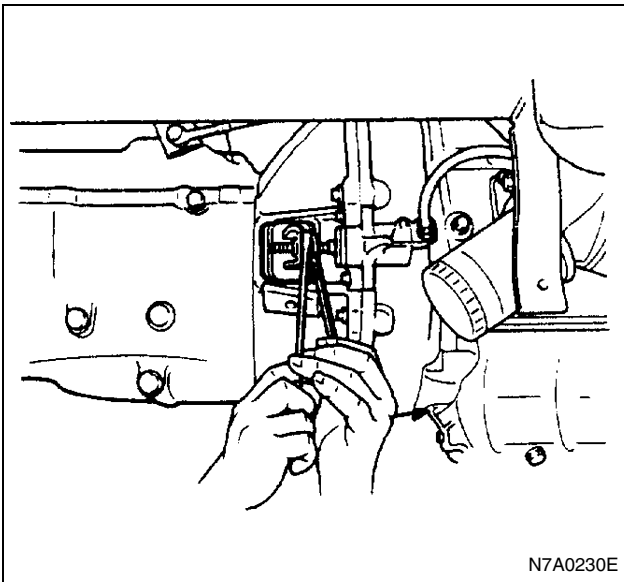
Tighten:

Slave cylinder bolt to 19 N·m (1.9 kg·m / 14 lb·ft)

- Perform slave cylinder adjustment before installation of the return spring.
- 1) Loosen the lock nut of the push rod.
 - 2) Turn the adjust nut until it reaches the shift fork.
 - 3) Back off the adjust nut 1.5 turns. (shift fork free play approximately 2 mm/0.1 in).
 - 4) Tighten the lock nut.

Tighten:

Push rod lock nut to 16 N·m (1.6 kg·m / 12 lb·ft)



2. Flexible Hose
3. Master Cylinder

- Install the master cylinder assembly to the clutch pedal bracket.

Tighten:

Fixing nuts to 13 N·m (1.3 kg·m / 113 lb·in)

4. Clutch Pedal
5. Return Spring
6. Clevis Pin
7. Shaft

8. Clutch Switch or Stopper Bolt
9. Clutch Pedal and Bracket Assembly

Tighten:

Clutch bracket bolts to 37 N·m (3.8 kg·m / 27 lb·ft)

- Perform the clutch pedal adjustment after installation of clutch control.

Clutch Pedal Height and Stroke

- 1) Loosen the lock nut of the master cylinder push rod.
- 2) Adjust the pedal height by turning the push rod.

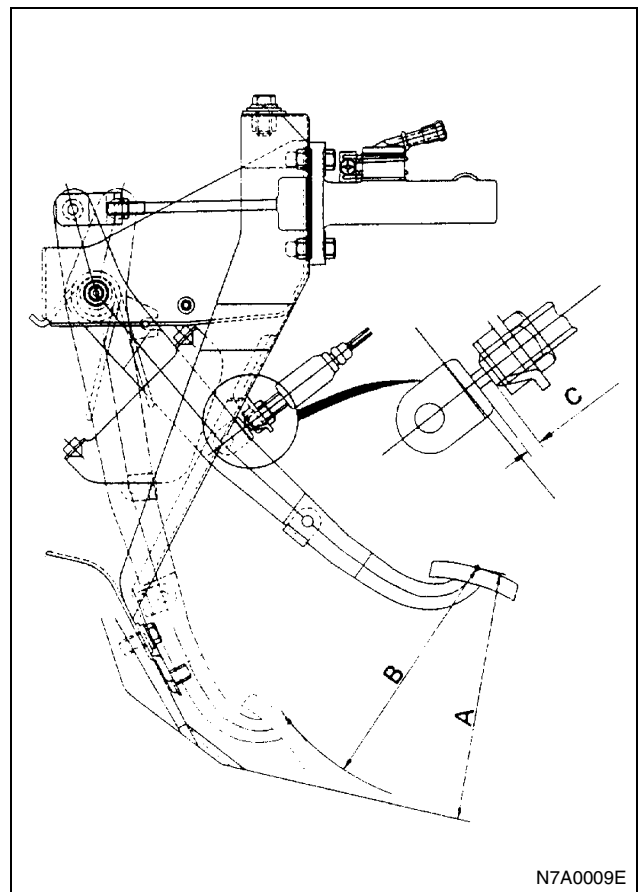
Clutch Pedal Height and Stroke	mm (in)
Height (A): 160 — 170 (6.3 — 6.7)	
Stroke (B): 159 — 169 (6.2 — 6.7)	

- 3) Tighten the lock nut.

Tighten:

Lock nut to 17 N·m (1.7 kg·m / 12 lb·ft)

- 4) Install the meter assembly and meter cluster.



Clutch Pedal Free Play

Clutch Switch or Stopper Bolt

After completion of clutch pedal height and slave cylinder adjustment, adjust the clutch switch or stopper bolt clearance.

- 1) Loosen the lock nut of clutch switch or stopper bolt.

- 2) Adjust the clutch switch or stopper bolt clearance by turning clutch switch or stopper bolt.

Clutch Switch or Stopper Bolt Clearance (C)	mm (in)
0.5 — 1.0 (0.02 — 0.04)	

Clutch Pedal Free Play	mm (in)
15 — 25 (0.6 — 1.0)	

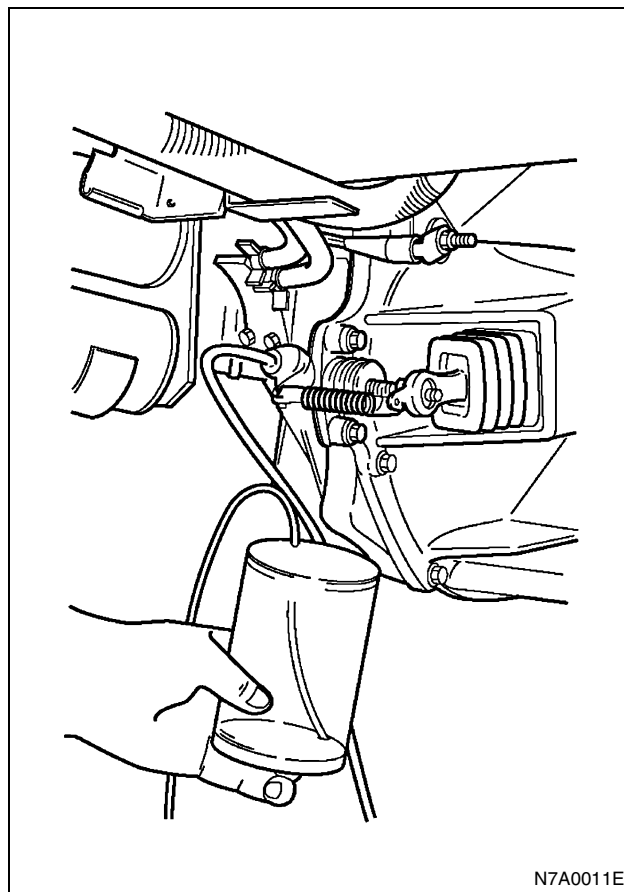
- 3) Tighten the lock nut.

Tighten:

Lock nut to 19 N·m (1.9 kg·m / 14 lb·ft)

10. Clutch Pipe and Hose

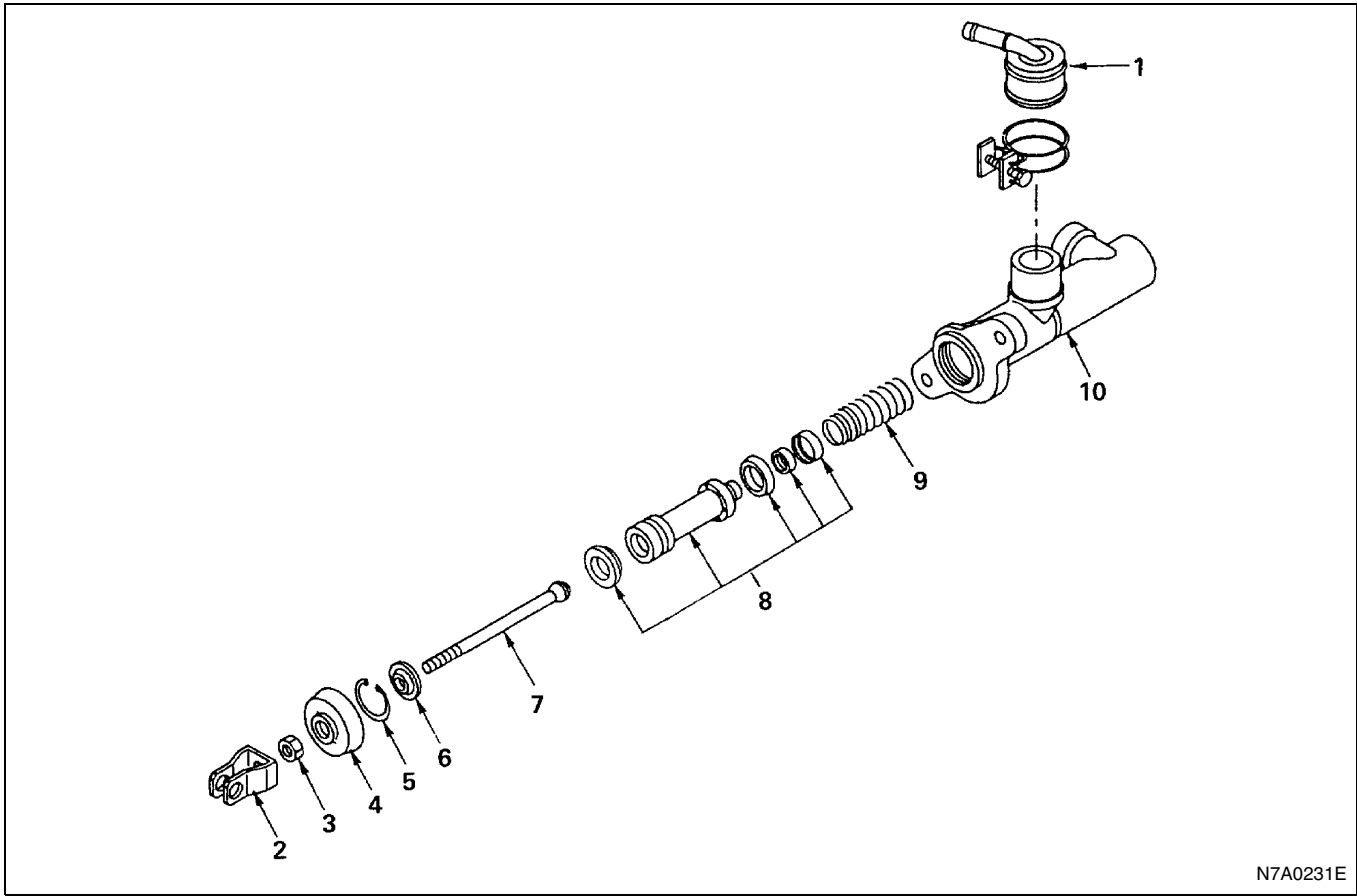
- Perform the clutch hydraulic circuit bleeding after installation of the clutch control. Bleeding operation calls for cooperative action of two men.
- 1) Check the level of clutch fluid in the reservoir and replenish if necessary.
 - 2) Remove the rubber cap from the bleeder screw and wipe clean the bleeder screw. Connect a vinyl tube to the bleeder screw and insert the other end of the vinyl tube into transparent container.
 - 3) Pump the clutch pedal repeatedly and hold it depressed.
 - 4) Loosen the bleeder screw on the clutch slave cylinder to release clutch to release clutch fluid with air bubbles into the container and tighten the bleeder screw immediately.
 - 5) Release the clutch pedal carefully. Repeat the above operation until air bubbles disappear from the clutch fluid being pumped out into the container. During the bleeding operation, keep the clutch fluid reservoir filled to the specified level.
Reinstall the rubber cap.



N7A0011E

UNIT REPAIR

Master Cylinder



N7A0231E

Legend

- | | |
|----------------|--------------------|
| 1. Pipe joint | 6. Stopper |
| 2. Clevis yoke | 7. Push rod |
| 3. Lock nut | 8. Piston assembly |
| 4. Dust cover | 9. Return spring |
| 5. Snap ring | 10. Cylinder body |

Disassembly

1. Pipe Joint
2. Clevis Yoke
3. Lock Nut
4. Dust Cover
5. Snap Ring
 - Press down the piston with your finger to prevent it from jumping out.
6. Stopper
7. Push Rod
8. Piston Assembly
9. Return Spring
10. Cylinder Body

Inspection and Repair

Make the necessary adjustments, repairs, and parts replacements if excessive wear or damage is discovered during inspection.

Cylinder Body

- Wash clean the cylinder body in brake fluid.
- Check the fluid return port for restrictions and clean it if necessary.
- Measure the cylinder bore diameter.

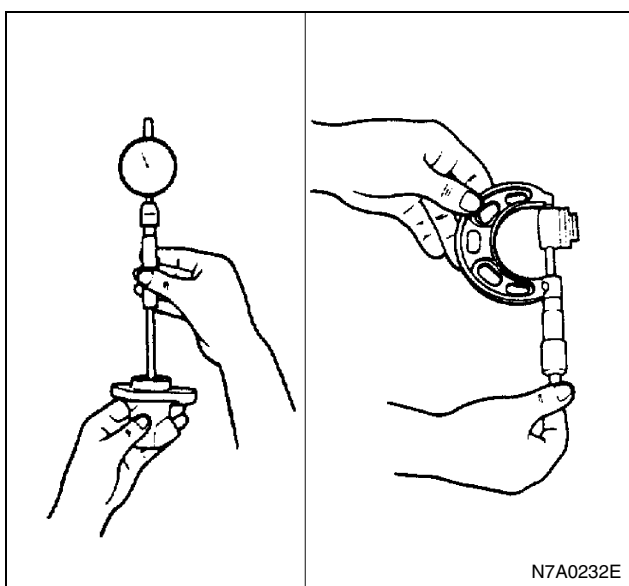
Master Cylinder Bore Diameter	mm (in)
Standard	
$\phi 19.050 - 19.102$ (0.7500 — 0.7520)	

Clearance between Cylinder Bore and Piston Clearance		mm (in)
Standard	Limit	
0.03 — 0.11 (0.001 — 0.004)	0.12 (0.005)	

- If excessive wear or any abnormal conditions are present, the master cylinder assembly must be replaced with new one.

Caution:

If the master cylinder has been disassembled, the repair kit must be replaced with new one.

**Reassembly**

- Cylinder Body
 - Immerse the cylinder body in clean brake fluid.
- Return Spring
 - Install the return spring to the piston assembly.
- Piston Assembly
 - Before installing, apply a thin coat of rubber grease to the piston.

Caution:

Use care to prevent damaging the lip of the piston cup.

- Push Rod
- Stopper
- Snap Ring
- Dust Cover
- Lock Nut

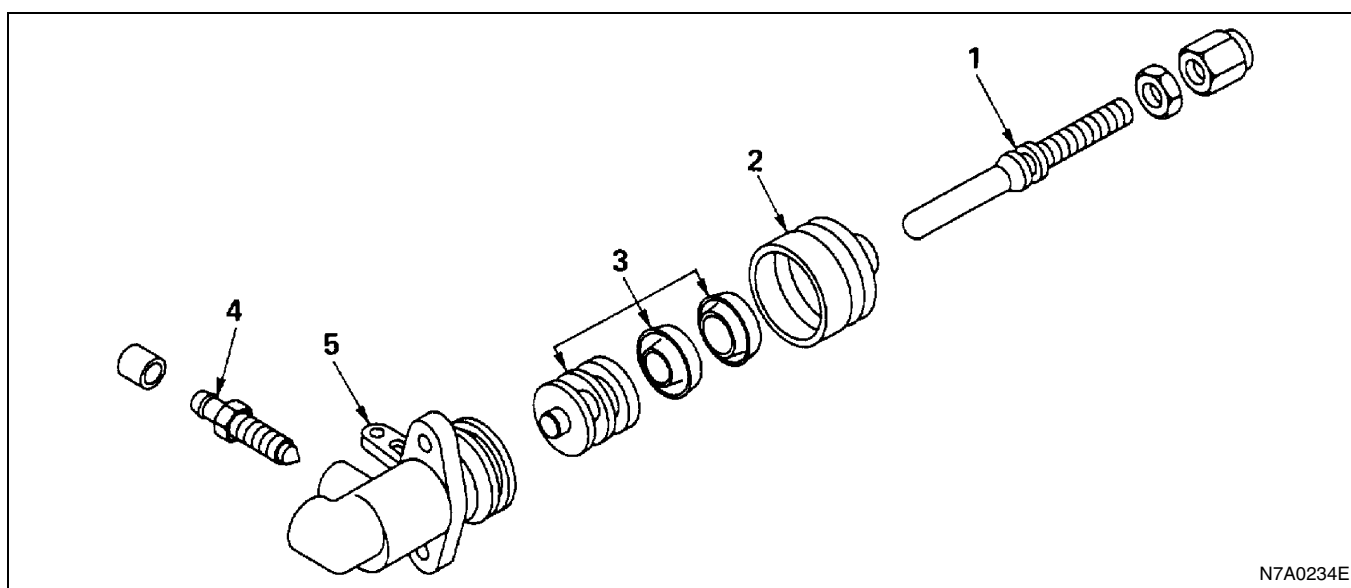
Tighten:

Lock nut to 17 N·m (1.7 kg·m / 12 lb·ft)

- Clevis Yoke
- Pipe Joint

Tighten:

Pipe joint to 5 N·m (0.5 kg·m / 43 lb·in)

Slave Cylinder

Legend

- | | |
|--------------------|------------------|
| 1. Push rod | 4. Bleeder screw |
| 2. Boot | 5. Cylinder body |
| 3. Piston assembly | |

Disassembly

1. Push Rod
2. Boot
3. Piston Assembly
4. Bleeder Screw
5. Cylinder Body

Inspection and Repair

Make the necessary adjustments, repairs, and parts replacements if excessive wear or damage is discovered during inspection.

Cylinder Body

- Wash clean the cylinder body in brake fluid.
- Measure the cylinder bore diameter.

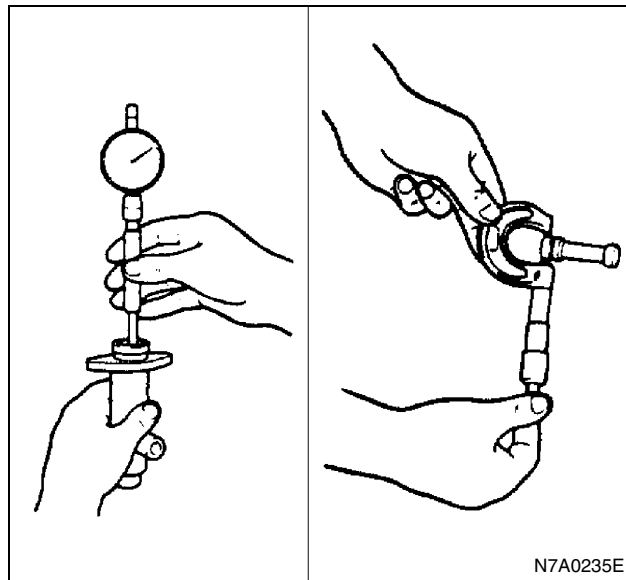
Cylinder Bore Diameter	mm (in)
Standard	
$\phi 26.990 - 27.042$ (1.0626 — 1.0646)	

Clearance between Cylinder Bore and Piston Clearance	mm (in)
Standard	Limit
0.02 — 0.10 (0.0008 — 0.0039)	0.11 (0.0043)

- If excessive wear or any abnormal conditions are present, the slave cylinder assembly must be replaced with new one.

Caution:

If the slave cylinder has been disassembled, the repair kit must be replaced with new one.

**Reassembly**

1. Cylinder Body
2. Bleeder Screw
3. Piston Assembly
 - Before installing, apply a thin coat of rubber grease to the piston.

Caution:

Use care to prevent damaging the lip of the piston cup.

4. Boot
5. Push Rod