## CLUTCH

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# SECTION CL

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#### **Precautions**

- Recommended fluid is brake fluid "DOT 4".
- Do not reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas.
  - When removing and installing clutch piping, use Tool.
- To clean or wash all parts of master cylinder, operating cylinder and clutch damper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. It will ruin the rubber parts of the hydraulic system.

#### WARNING:

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Remove all dust from clutch disc with a dust collector after cleaning with waste cloth.

#### Preparation SPECIAL SERVICE TOOLS

\*: Special tool or commercial equivalent

Tool number Tool name	Description	
ST20050010 Base plate		Inspecting diaphragm spring of clutch cover
ST20050100 Distance piece		Inspecting diaphragm spring of clutch cover
GG94310000 Flare nut torque wrench		Removing and installing each clutch piping
KV30100100* Clutch aligning bar		Installing clutch cover and clutch disc
ST20050240* Diaphragm spring adjusting wrench		Adjusting unevenness of diaphragm spring of clutch cover



### **CLUTCH SYSTEM**

**Clutch Pedal** 



#### **Adjusting Clutch Pedal**

 Adjust pedal height with pedal stopper. Pedal height "H": LHD: 227 - 237 mm (8.94 - 9.33 in) RHD: 210 - 220 mm (8.27 - 8.66 in)

 Adjust pedal free play with master cylinder push rod. Then tighten lock nut. Pedal free play "A":

1.0 - 3.0 mm (0.039 - 0.118 in)





#### **Bleeding Procedure**

1. Bleed air from clutch operating cylinder according to the following procedure.

## Carefully monitor fluid level at master cylinder during bleeding operation.

- a. Top up reservoir with recommended brake fluid.
- b. Connect a transparent vinyl tube to air bleeder valve of clutch damper.
- c. Fully depress clutch pedal several times.
- d. With clutch pedal depressed, open bleeder valve to release air.
- e. Close bleeder valve.
- f. Repeat steps (c) through (e) above until brake fluid flows from air bleeder valve without air bubbles.
- 2. Bleed air from clutch operating cylinder according to the above procedure.
- 3. Repeat the above bleeding procedures 1 and 2 several times.



#### **Clutch Master Cylinder**

#### INSPECTION

- Check cylinder and piston rubbing surface for uneven wear, rust or damage. Replace if necessary.
- Check piston and piston cup for wear or damage. Replace if necessary.
- Check return spring for wear or damage. Replace if necessary.
- Check reservoir for deformation or damage. Replace if necessary.
- Check dust cover for cracks, deformation or damage. Replace if necessary.

#### **Clutch Operating Cylinder**



#### INSPECTION

- Check rubbing surface of cylinder for wear, rust or damage. Replace if necessary.
- Check piston and piston cup for wear or damage. Replace if necessary.
- Check piston spring for wear or damage. Replace if necessary.
- Check dust cover for cracks, deformation or damage. Replace if necessary.

### CLUTCH RELEASE MECHANISM





#### **REMOVAL AND INSTALLATION**

• Install retainer spring and holder spring.



Press.

Drift

SCL222

• Remove release bearing.

• Install release bearing with suitable drift.

#### INSPECTION

- Check release bearing to see that it rolls freely and is free from noise, cracks, pitting or wear. Replace if necessary.
- Check release sleeve and withdrawal lever rubbing surface for wear, rust or damage. Replace if necessary.



#### LUBRICATION

• Apply recommended grease to contact surface and rubbing surface.

Too much lubricant might cause clutch disc facing damage.

#### DUST COVER SEALING

• Apply recommended sealant to contact surface of dust cover to transmission case and withdrawal lever and then install dust cover clip.

#### **CLUTCH DISC AND CLUTCH COVER**



Too much lubricant might damage clutch disc facing.



#### **Clutch Cover and Flywheel**

#### INSPECTION AND ADJUSTMENT

Set Tools and check height and unevenness of diaphragm

Diaphragm spring height "A": 36.5 - 38.5 mm (1.437 - 1.516 in)

- Check thrust rings for wear or damage by shaking cover assembly and listening for chattering noise, or lightly hammering on rivets for a slight cracking noise. Replace clutch cover assembly if necessary.
- Check pressure plate and clutch disc contact surface for slight burns or discoloration. Repair pressure plate with emery paper.
- Check pressure plate and clutch disc contact surface for deformation or damage. Replace if necessary.

Adjust unevenness of diaphragm spring with Tool. Uneven limit: 0.7 mm (0.028 in)

#### **FLYWHEEL INSPECTION**

- Check contact surface of flywheel for slight burns or discoloration. Repair flywheel with emery paper.
- Check flywheel runout.
  - Runout (Total indicator reading): Refer to EM section. (Inspection — CYLINDER

#### **CLUTCH DISC AND CLUTCH COVER**



## Clutch Cover and Flywheel (Cont'd) INSTALLATION

- Insert Tool into clutch disc hub when installing clutch cover and disc.
- Tighten bolts in numerical order.
- Be careful not to allow grease to contaminate clutch facing.

#### **General Specifications**

#### **CLUTCH CONTROL SYSTEM**

Type of clutch control

Hydraulic

#### **CLUTCH MASTER CYLINDER**

Inner diameter

mm (in) 15.87 (5/8)

#### **CLUTCH OPERATING CYLINDER**

Inne	er diameter	mm (in)	
	LHD		17.46 (11/16)
	RHD		19.05 (3/4)

#### **CLUTCH DISC**

		Unit: mm (in)
Engine	TD27Ti	ZD30DDTi
Model	250	260
Facing size (Outer dia. x inner dia. x thickness)	250 x 160 x 3.7 (9.84 x 6.30 x 0.1457)	
Thickness of disc assembly under load	7.9 - 8.3 (0.311 - 0.327) Under a load of 5,884 N (600 kg, 1,323 lb)	

#### **CLUTCH COVER**

Engine		TD27Ti	ZD30DDTi
Model		250	260
Full load	N (kg, lb)	5,884 (600, 1,323)	6,760 (689, 1,520)

## **Inspection and Adjustment**

#### **CLUTCH PEDAL**

		Unit: mm (in)
Handle	LHD	RHD
Pedal height*	227 - 237 (8.94 - 9.33)	210 - 220 (8.27 - 8.66)
Pedal stroke	155 - 160 (6.10 - 6.30)	
Pedal free play (Backlash at clevis)	1.0 - 3.0 (0.039 - 0.118)	

\*: Measured from surface of melt sheet to surface of pedal pad

#### **CLUTCH DISC**

		Unit: mm (in)
Engine	TD27Ti	ZD30DDTi
Disc model	250	260
Rear limit of facing surface to rivet head	0.3 (0.012)	
Runout limit of facing	1 (0.04)	
Distance of runout check point (from the hub center)	120 (4.72)	
Maximum of spline backlash of spline (at outer edge of disc)	1.0 (0.039)	

#### **CLUTCH COVER**

		Unit: mm (in)
Engine	TD27Ti	ZD30DDTi
Cover model	250	260
Diaphragm spring height	36.5 - 38.5 (1.437 - 1.516)	
Uneven limit of dia- phragm spring toe height "A"	0.7 (0.028)	