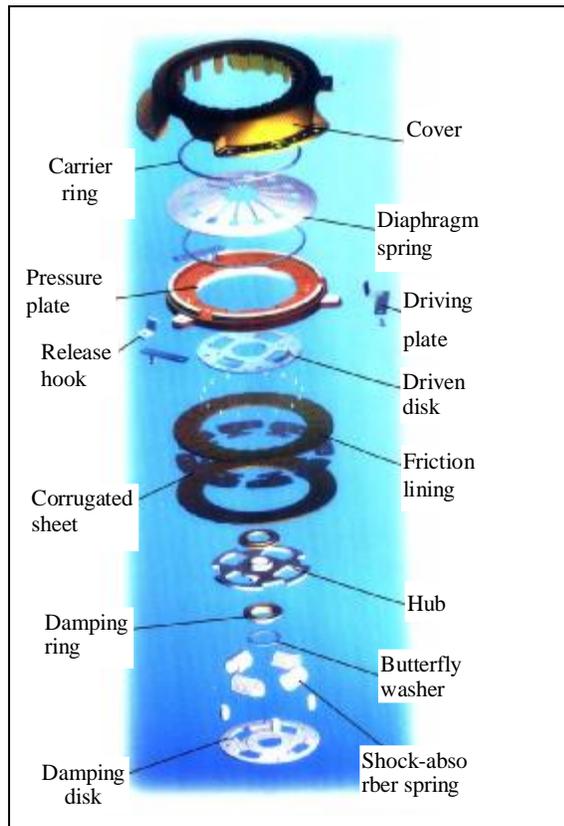


CLUTCH

Clutch Structure II -2

Clutch Trouble-Shooting II -3

Caution for Clutch Installation and Adjustment II -8



Clutch Structure

(Typical Structure of Diaphragm-Spring Clutch)

(1) Clutch:

The clutch is mainly composed of two assemblies: clutch cover assembly and clutch driven disk assembly.

(2) Clutch cover assembly:

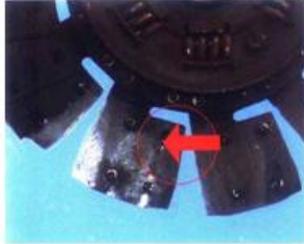
The clutch cover assembly has the following typical units: cover, diaphragm spring, carrier ring, pressure plate, release hook, driving plate, etc.

(3) Clutch driven disk assembly:

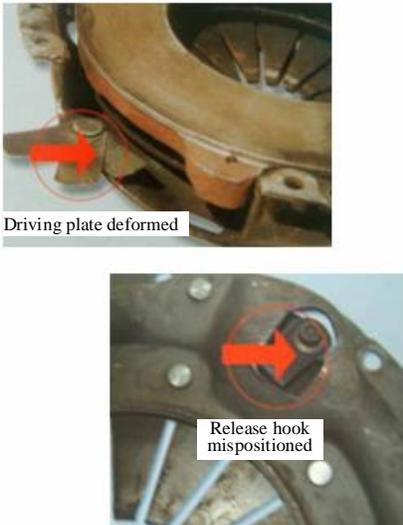
The Clutch driven disk assembly has the following typical units: hub, driven disk, damping disk, corrugated sheet, friction lining, shock-absorber spring, rivet, etc.

Clutch Troubleshooting

1 Clutch Slippage

| Trouble | Cause | Remedy |
|---|--|--|
| <p>(1) When the clutch pedal is released during starting, the vehicle fails to start or starts slowly.</p> <p>(2) When the accelerator pedal is pressed during running, the vehicle speed can not increase obviously with the increase of the engine speed.</p> <p>(3) The power is not sufficient during ascending; the clutch is slipped and even spreads burning smell.</p> <p>(4) When the clutch pedal is released during starting, the vehicle fails to start or starts slowly.</p> | <p>The clutch operating system is not adjusted properly, clutch pedal has no free travel, and there is no gap between the release bearing and the release finger. Even when the clutch is engaged, the finger tip of the diaphragm spring is still compressed and deformed so that the pressure plate can not press the driven disk firmly. The clutch pedal can not return to its original position reliably.</p> | <p>Adjust the initial gap, and adjust the free travel of the clutch pedal and total travel of the pedal to ensure the reliable release and engagement of clutch.</p> |
| <p>When the accelerator pedal is pressed during running, the vehicle speed can not increase obviously with the increase of the engine speed.</p> | <p>(1) The friction lining of driven disk is uneven, worn and oily polluted after being burnt.</p>  | <p>Replace driven disk assembly of which the surface is oily polluted or uneven.</p> |
| | <p>(2) The fixing bolt between the engine flying wheel, clutch pressure plate, clutch cover and flying wheel is loose and the operating face of flying wheel is grooved.</p> | <p>Eliminate the deformation and wear of the flying wheel, fix the clutch on the flying wheel firmly and make sure the bolt is tightened to its position.</p> |
| | <p>(3) The driven disk hub spline is seized with a shaft of transmission.</p>  | <p>Repair the driven disk hub inner spline or the transmission input shaft spline to eliminate the seizing factor.</p> |
| <p>The power is not sufficient during ascending; the clutch is slipped and even spreads burning smell.</p> | <p>(1) The diaphragm spring is damaged or attenuated in load.</p>  | <p>Replace the diaphragm spring or the clutch cover assembly.</p> |
| | <p>(2) The clutch is used under overload.</p> | <p>Make sure that the vehicle runs with overload.</p> |

2 Incomplete Release of Clutch

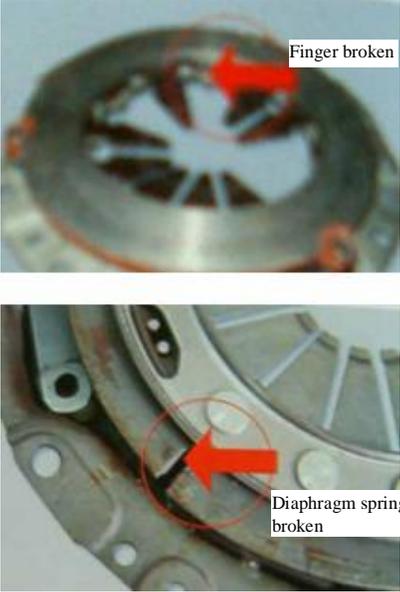
| Trouble | Cause | Remedy |
|---|--|--|
| <p>When the clutch pedal is pressed during gear shift, the clutch is not released completely and at a state of semi-release and semi-engagement. It is difficult to engage a gear, and there is smash from the transmission gear. After the transmission engages a gear and the clutch pedal is not released, the vehicle starts or the engine is misfired.</p> | <p>(1) Improperly adjusted clutch operating system and excessive free travel of clutch pedal cause too small operating travel and incomplete release of clutch with pedal fully pressed.</p> | <p>Readjust the operating system, and adjust the free travel of the clutch pedal to ensure full release of the clutch.</p> |
| | <p>(2) When the operating system is Hydraulically driven, it is caused by lack of oil, existence of air or incomplete return of release bearing.</p> | <p>Add oil to the automatic adjusting mechanism, remove the air, and remove the failure of release bearing to return.</p> |
| | <p>(3) Element of operating system is damaged.</p> | <p>Replace the damaged part in operating system.</p> |
| | <p>(4) The driven disk inner spline is seized on the spline shaft.</p>  | <p>Repair the driven disk hub inner spline or the transmission input shaft spline to free their movement.</p> |
| | <p>(5) The overspeed travel of release bearing causes interference between the diaphragm spring and the driven disk.</p> | <p>Adjust the travel of release bearing reasonably.</p> |
| | <p>(6) Seriously worn and excessively gapped driven disk hub spline and transmission No. 1 shaft spline cause excessive jumping to impact the free rotation mount of the driven disk.</p> | <p>Replace the driven disk, and replace transmission No. 1 shaft.</p> |
| | <p>(7) Transmission No. Shaft is damaged.</p> | <p>Repair or replace transmission No. 1 shaft.</p> |
| | <p>(8) The clutch release hook and driving plate deformed or mispositioned.</p>  | <p>Do not install them on the vehicle, and replace the clutch.</p> |

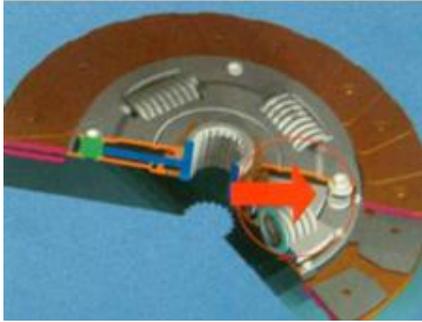
| Trouble | Cause | Remedy |
|---|---|---|
| <p>When the clutch pedal is pressed during gear shift, the clutch is not released completely and at a state of semi-release and semi-engagement. It is difficult to engage a gear, and there is smash from the transmission gear. After the transmission engages a gear and the clutch pedal is not released, the vehicle starts or the engine is misfired.</p> | (9) The clutch friction lining is loose or uneven in surface due to fall. | Polish the uneven friction lining surface of the clutch driven disk assembly, replace the friction lining or replace the driven disk. |
| | (10) The friction lining surface is oily. | Remove the oil stains from the friction lining or replace. |
| | (11) The diaphragm spring is attenuated in load or worn in finger tip. | Replace the diaphragm spring or the clutch cover assembly. |
| | (12) Excessive application of semi-release and semi-engagement causes the clutch to generate thermal deformation. | Properly use the semi-release and semi-engagement. |
| | (13) The transmission or the engine guide bearing is worn in deteriorated way, resulting in eccentricity. | Replace the worn bearing part. |
| | (14) The clutch release fork seat and ball head are worn or deformed. | Replace the clutch release fork seat. |
| (15) Loose fixing bolt or foreign object on the mating faces between clutch cover and flying wheel causes eccentricity. | Remove the foreign object from mating faces, and secure the clutch cover on the flying wheel. | |

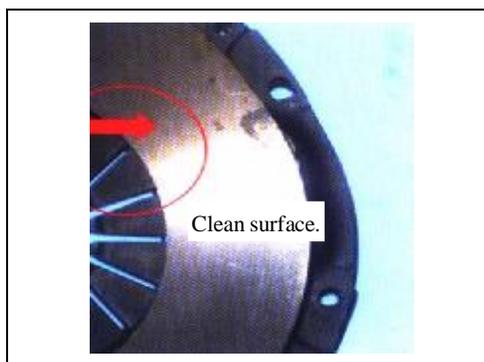
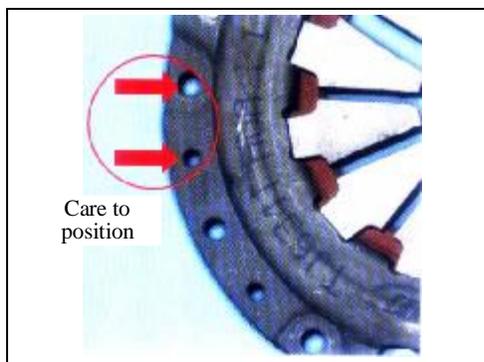
3 Clutch Shaking

| Trouble | Cause | Remedy |
|--|--|---|
| <p>When the driver releases the clutch pedal stably with normal operation during starting, the vehicle can not be started stably but shakes abnormally, and vibration is felt during movement.</p> | (1) Unevenly tightened clutch cover assembly and flying wheel cause uneven and excessively worn finger tip of clutch cover assembly. | To install the cover assembly, diagonally tighten the bolts for several times to their tightening torque. |
| | (2) The engine flying wheel, pressure plate and driven disk is deformed or uneven in surfaces. There are three operating areas when being pressed. | Eliminate deformation of the flying wheel, or replace the pressure plate or driven disk, and fix the clutch on the flying wheel reliably. |
| | (3) The bolt fixing the flying wheel on the crankshaft is loose, the bolt fixing the transmission casing on the clutch is loose and the engine mounts are loose or one of them is missing. | Tighten the flying wheel fixing bolt and transmission fixing bolt, fix the engine mount or replace with new one. |
| | (4) The clutch driven disk hub spline is worn, the transmission No.1 shaft spline shaft is worn or deformed, and their slide is not free. | Replace the driven disk, or repair the transmission No. 1 shaft. |
| | (5) The friction lining is oily, the driven disk is buckling and uneven, and the friction lining rivet is exposed or loose. | Grind the friction lining flat, wipe off the oil stains or replace the driven disk. |

4 Abnormal Sound of Clutch

| Trouble | Cause | Remedy |
|---|---|--|
| <p>When the clutch has abnormal sound during vehicle running, it is mostly caused by the seriously worn clutch part, resulting in impact sound in matching. Or some part falls and is seized in the clutch so that the abnormal sound is generated.</p> | <p>(1) Excessive axial jumping of the transmission No. 1 shaft intensifies the relative movement between the damping disk and the hub, resulting in severe wear to the damping window and fall of the shock-absorber spring.</p>  | <p>Replace the bad guide bearing, axle bush and their parts.</p> |
| | <p>(2) The driven disk hub spline is severely worn or the transmission No.1 shaft spline is worn, and the gap between the two is excessive.</p> | <p>Replace the driven disk, or repair the spline shaft.</p> |
| | <p>(3) The clutch release bearing is lack of oil or damaged.</p> | <p>Repair or replace the damaged clutch release bearing.</p> |
| | <p>(4) The diaphragm spring or one finger is broken.</p>  | <p>Replace the diaphragm spring.</p> |
| | <p>(5) Operation is improper or clutch release is incomplete during gear shift.</p> | <p>Eliminate the factor of incomplete clutch release.</p> |

| Trouble | Cause | Remedy |
|--|---|---|
| <p>When the clutch has abnormal sound during vehicle running, it is mostly caused by the seriously worn clutch part, resulting in impact sound in matching. Or some part falls or is seized in the clutch so that the abnormal sound is generated.</p> | <p>(6) The torsion shock-absorber spring falls or displaces, and the stop pin is worn due to impact.</p>  | <p>Replace the driven disk assembly.</p> |
| | <p>(7) Foreign object, such as screw, enters the clutch.</p>  | <p>Remove the metal foreign object from the clutch.</p> |



Caution for Clutch Installation and Adjustment

- (1) Before installation of the clutch, first check that the side face of the flying wheel matched with the clutch is flat and clean, and that the transmission No.1 shaft is free from looseness, and make sure that there is not any problem, and then conduct installation.
- (2) Before installing the driven disk assembly, apply a thin layer of lithium grease in the spline hole (do not apply other grease).

Then sleeve the transmission No.1 shaft, and move it forward and rearward without any stagnation.

- (3) Before installation, check the flying wheel and release bearing for normal condition, the bearing for free rotation, the transmission No.1 shaft for serious wear and the matching for normal condition.
- (4) Before installation of the clutch cover assembly, wipe off the oil stain from the pressure plate surface.
- (5) During installation of the clutch cover assembly, pay attention to the direction of the big and small locating holes and do not misinstall them.
- (6) To install the clutch cover assembly, diagonally and symmetrically tighten the bolts to their tightening torque.
- (7) During installation of the clutch, keep clean and do not dirty the surface of clutch driven disk friction lining.
- (8) During installation of clutch, take care to center the clutch and flying wheel without any misalignment.
- (9) After all the assembly is completed, check the free travel of clutch pedal by pressing it. Make sure that there is not any problem, conduct trial run and check at low speed movement that the clutch is normal.
- (10) Absolutely do not install the crashed, watered and oily cover assembly and driven disk assembly.
- (11) Do not repair and modify any part and assembly of the clutch at one's will.

Drive Shaft

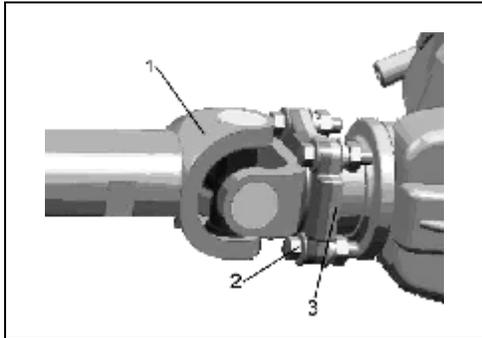
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| Drive Shaft Inspection and Repair Data | III-2 |
| Removal and Installation of Drive Shaft..... | III-3 |

Drive Shaft Inspection and Repair Data

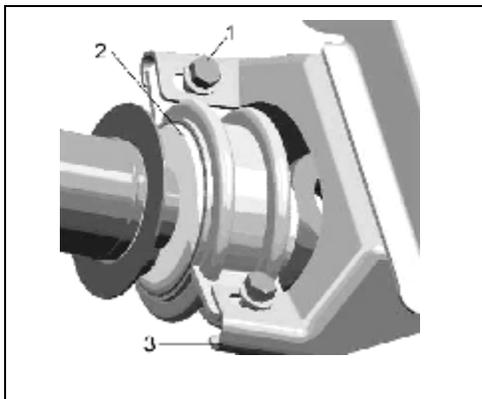
| Item | Specification |
|----------------------------------|---------------|
| Limit | |
| Drive shaft run-out tolerance mm | |
| Front | 0.6 |
| Rear | 0.6 |

Removal and Installation of Drive Shaft

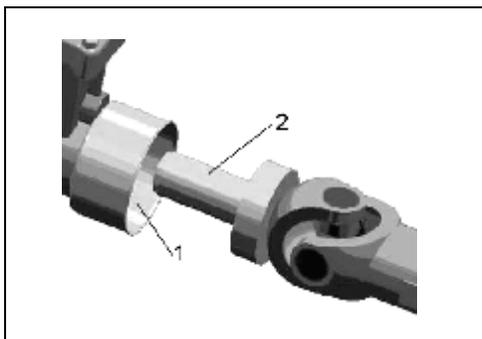
Removal of Drive Shaft (4*2)



- (1) Loosen four bolts ② fixing the drive shaft to separate drive shaft ① from rear axle flange ③.



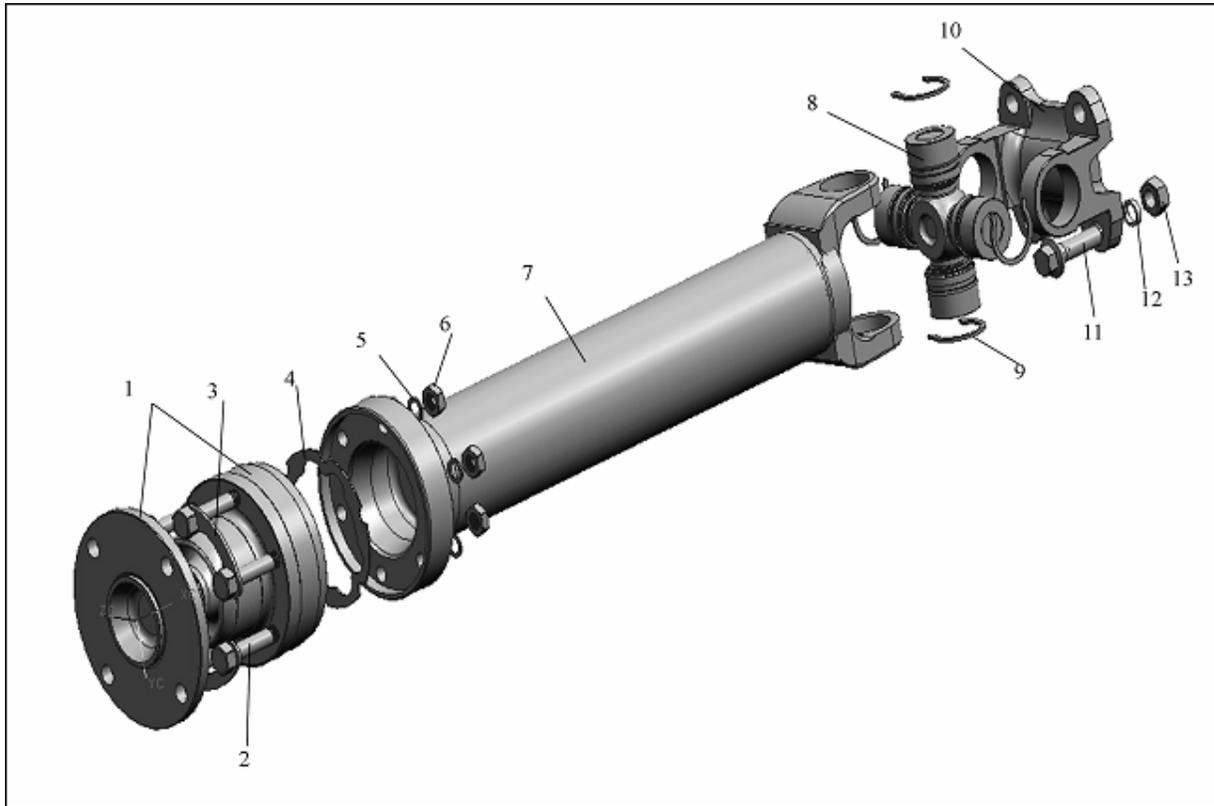
- (2) Loosen two bolts ① fixing the drive shaft to separate drive shaft ② from frame ③.



- (3) Finally pull out the drive shaft from the transmission rear output shaft, and plug port ① of transmission to prevent dirt from entering its inside.

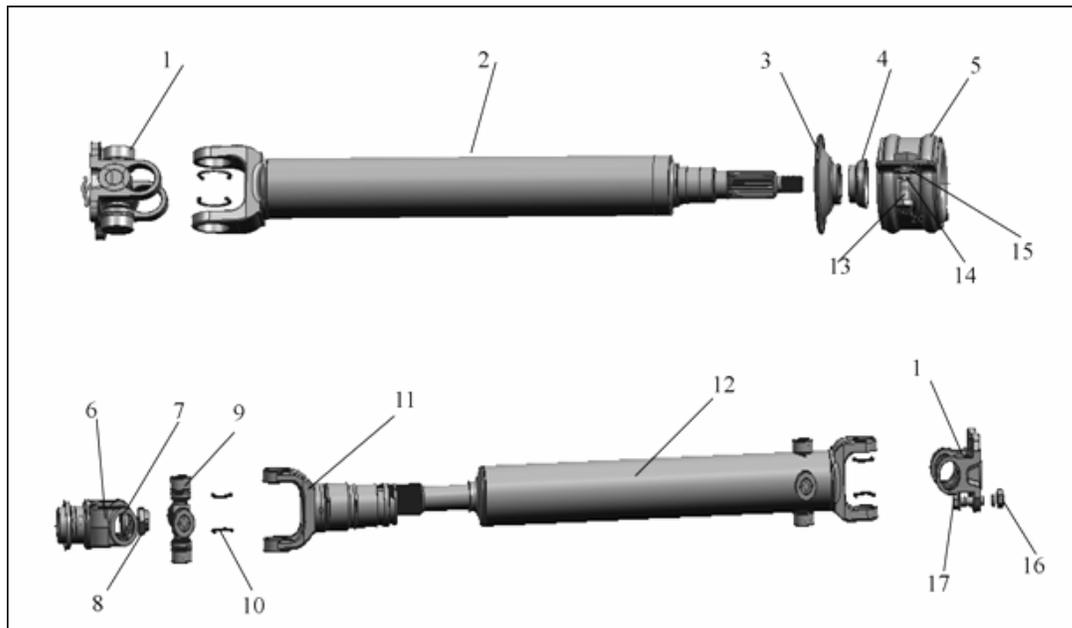
Removal of Drive Shaft (4*4)

Front Drive Shaft Assembly

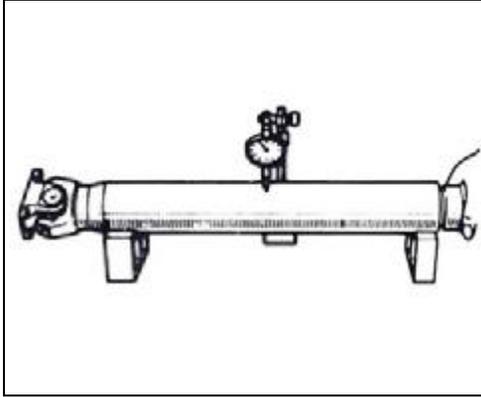
**Parts List**

1. LJ flange assembly
2. Hexagon bolt
3. Washer
4. Dustproof pad
5. Gasket
6. Nut
7. Soldered assembly
8. Universal joint assembly
9. Retaining ring
10. Flange yoke
11. Drive shaft bolt
12. Spring washer
13. Drive shaft nut

Drive Shaft Assembly

**Parts List**

1. Flange yoke
2. Front soldered assembly
3. Big boot
4. Small boot
5. Intermediate mounting assembly
6. Non-slip yoke assembly
7. Gasket
8. Nut
9. Universal joint assembly
10. Retaining ring
11. Slip yoke assembly
12. Rear soldered assembly
13. Hexagon head bolt
14. Spring washer
15. Flat washer
16. Drive shaft nut
17. Drive shaft bolt



Inspection of Drive Shaft

- Check that the universal joint moves freely and stably in all the directions.
- Check the drive shaft for bending, torsion or damage.
- Check the radial jumping of drive shaft.

As shown in the Fig.,

Support the drive shaft with V-shaped rack, level first and then turn it, and check radial jumping of the drive shaft with a dial gauge. If the radial jumping exceeds the max. value of 0.6mm, it is seriously damaged. Conduct correction or replacement.

Installation of Drive Shaft

Install the drive shaft to its position in reverse order of removal, and tighten it to the torque of 64 ± 6 N.m.