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SERVICE CIRCULAR

DO'S AND DONT'S

The Integral Power Steering Gear is a precision assembly. In order that it should provide long service life following points need to be carefully observed during the operation / maintenance of the steering gear.

SPECIFIED OILS

1. Use only specified oil which should be clean and free of impurities, stored in good and clean containers. Recommended oil is Automatic Transmission Fluid (ATF) with specification Dexron IID / IIE / III or Mercon - M.
2. Do not use contaminated oil. Oil mixed with water, any other oil, diesel, kerosene and dirt should not be used at any cost. This may cause pump failure and steering gear failure.
3. Do not mix different brands of oil.
4. Do not allow oil level in the oil tank to go below the minimum mark while the engine is running.
5. Do not use reconditioned oil.
6. Ensure that no oil leaks through any of the hose-pipes, adaptors, steering gear, pump and oil tank.
7. Check the oil level in the oil tank at intervals of 5000-6000 kms.
8. Ensure proper belt tension on steering pump and replace belt as per recommendation.

CAUTION

ARREST THE LEAKAGES IMMEDIATELY, ABSENCE OF OIL WILL CAUSE FAILURE OF THE SYSTEM.

IN OIL TANKS WITH CONNECTORS ALWAYS USE TWO SPANNERS, ONE TO HOLD AND ANOTHER TO LOOSEN / TIGHTEN THE CONNECTOR / ADAPTOR.



ZF STEERING GEAR (INDIA) LTD.

(A TS 16949 & ISO 14001 COMPANY)

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REMOVAL & FITMENT OF STEERING GEAR SHAFT-SEAL

1. On noticing oil leakage from the steering gear top side confirm from where exactly the oil leakage is taking place from.
2. If the leakage is from underneath the protective cap, remove the steering gear assembly from the vehicle. For this follow the procedure :
 - a) Remove oil from the system by loosening the pipe connection of the steering gear assembly.
 - b) Remove the bottom bolt and nut of the universal joint from the steering gear input shaft and pull up the steering wheel along with the universal joint.
 - c) Loosen the small end of drop-arm, remove drag link and remove the drop-arm.
 - d) Loosen the 4 nos of mounting bolt of steering gear assembly.
 - e) Remove the steering gear assembly from the bracket.
3. Remove the protective cap.
4. Remove the circlip with the help of circlip plier.
5. Pierce the metallic part of the oil-seal in the middle portion with a sharp instrument and by applying lever remove the damaged oil seal by prying.
6. Clean the surface area of the input shaft and End Cover. See that the surface is not damaged.
7. Replace new oil-seal duly filled with grease with the help of service tool.
8. Fit the circlip.
9. Fit the protective cap by filling grease.

NOTE

USE OF PULLER SHOULD BE MADE TO REMOVE DROP ARMS, AS HAMMERING OF DROP ARM MAY DAMAGE INTERNAL COMPONENTS.
DO NOT REMOVE THE END-COVER OF STEERING ASSEMBLY FOR SHAFT-SEAL REPLACEMENT

Corporate Office : 601-602, MCCIA, International Convention Center,
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ZF Power Steering Ensures Safety and Comfort

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MAINTENANCE TO BE CARRIED OUT ON ZF INTEGRAL POWER STEERING SYSTEM

1. Recommended Oils :

The system requires a special oil "AUTOMATIC TRANSMISSION FLUID" (ATF) having following specifications, Dexron IID / IIE / III.

For Example : The oil recommended by a Oil Company will be as follows :-

- 1) Indian Oil Corporation Ltd. Servo Transdex-II.
- 2) Castrol India Ltd. CASTROL TQD. etc.

2. Oil Filling :

Remove cover of oil tank and pour clean, dust free oil into tank to three fourth of its capacity. Jack up the axle, CRANK the engine, as the oil level goes down keep topping up until no more oil level drop is observed. Now START the engine, to get oil level up to maximum mark of dipstick, top up if required.

3. Bleeding :

Jack up the vehicle and with the engine running turn the Steering wheel to both lock position several times and slightly (for max 5 secs) over ride the axle stops. This will enable to vent air from the system. Now stop the engine and check oil level. The oil level should not increase more than 10mm to 12 mm. More increase will indicate improper bleeding of air. Repeat process.

4. Checking of the oil level :

Check oil level at intervals of 5000-6000 kms or after 100-120 hours of operation.

5. Change of oil and filters is recommended to be carried out at every following mileage :

For vehicles running mixed And short distance	On constructions sites and off-the-road
80,000 kms	50,000 kms
50,000 miles	30,000 miles
	1250 op. hours

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TROUBLES WHICH MAY LEAD TO FAILURE OF THE STEERING PUMP

1. Loss of Oil :

With the engine running, check / top up oil level. Repair all external leaks.

Note : While tightening hose-pipes and connectors make use of two spanners, one to hold and one to tighten, to prevent slippage and rotation of adaptors on the oil-reservoir, pump and steering gear.

2. Wrong Grade of Oil :

Use "Automatic Transmission Fluid" (ATF) only, to specification Dexron IID / IIE / III or Mercon - M.

- 1) Indian Oil Corporation Ltd. Servo Transdex-II.
- 2) Castrol India Ltd. CASTROL TQD.

3. Air in Oil :

Oil is foaming. Pump is sucking in air at the shaft seal of the pump or at the suction line. Tighten all connectors & Pipes from oil tank to pump.

4. Oil Dirty :

Change Oil and filter. Dirt particle may cause the pump to fail. Filter and Oil change recommended between 50,000 kms. & 80,000 kms. (As per Docking Plan)

Note : If engine oil is entering the steering oil Reservoir and mixing up with steering oil, will turn black and oil-level will rise. Replace pump's shaft seal.

5. Hydraulic Steering Limiter Does Not Cut Off

Check if limiters are disturbed

Note : Limiters are set while commissioning the vehicle, Correct the settings as per service manual.

6. Permanent Max. Pressure Reached While Steering

Axle not smooth, Overloading of steering axle, Tyres worn out, Tyre inflation too low, Steering Geometry disturbed can cause this problem. Correct the setting as per service manual.

7. While driving Under Extreme Conditions, Driver Holding Steering Wheel Turned

Pump is working for a long time under max. pressure conditions. Development of heat and failure of the pump.

THE FOLLOWING SHOULD BE OBSERVED :

- Maximum permissible loading of the vehicle.
- Specified tyre inflation pressure.
- Specified intervals of maintenance.
- Arresting all external leakages.

NOTE:

OBSERVING THESE INSTRUCTIONS WILL GUARANTEE A LONG SERVICE LIFE OF THE PUMP

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