GROUP 4 AUXILIARY PUMP

1. FUNCTION

1) DESIGN

This gear pumps utilize an external spur gear, positive displacement, and pressure balanced design, providing superior efficiency. These high performance pumps are of a three piece construction, utilizing a cast iron flange and cover with aluminum gear housings. The extruded aluminum housing provides the necessary strength while providing a very high power to weight ratio. Most importantly, the aluminum center section permits the gear teeth to create their own path into the gear housing(Track in) for maximum radial tip seal and high volumetric efficiency.

ip01

2) PRECISE GEAR ALIGNMENT

Cast aluminum bearing blocks are fitted to the gear pockets for precise alignment. Since all parts are contained in the housing the possibility of misalignment is eliminated. The load is carried uniformly without stress being applied to either the end cap or the front cover. Teflon coated pressure lubricated bronze bushings in each bearing block ensure a long operating life.

ip02

3) ROBUST CONSTRUCTION

One piece gear/shaft construction provides both high strength and an accurate profile. Each integral gear/shaft is constructed of bearing quality hardened steel which is machined to precise tolerance for minimum leakage. The one piece design also eliminates the potential problems of stress fatigue often associated with two piece designs.

4) LEAK PROTECTION

Various seals are available to meet specific applications. Standard are dual Buna seals to prevent leakage and migration of fluids from the hydraulic circuit to the gear box.

5) PRESSURE BALANCE

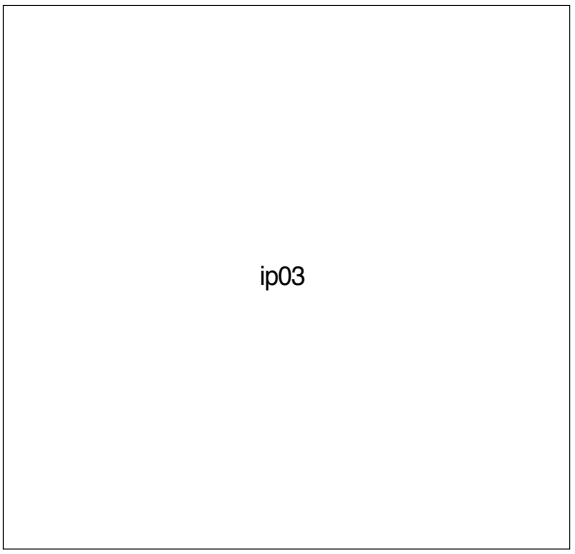
(1) Pressure balance sealing on each side of the gears contributes to high volumetric efficiency and maximum sealing on the pump.

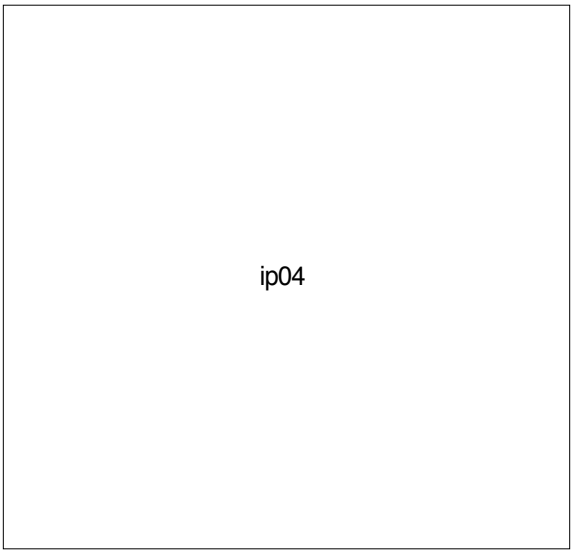
(2) The pump are each equipped with pressure balance sealing that is incorporated into the bearing blocks. This design provides high efficiency at both low and high speed for maximum efficiency throughout the speed range.

(3) Accurately defined pressure zones at the rear faces of the bearing blocks receive oil under pressure which loads the bearing against the gear side face. Contact force between bearing face and gear is low and precisely controlled across wide speed, pressure and temperature ranges. The result is typical volumetric efficiencies in the range of 95% through effective sealing between gear and bearing faces without causing undue wear or overheating between these faces.

(4) In order to prevent pressure trapping in between the meshing gear teeth, channels in the bearing blocks permit relief of the trapped fluid to the suction side of the pump. Running clearances are maintained tight enough to minimize leakage across the gear faces, yet sufficient to maintain the oil film between mating surfaces for minimum wear. As pressure increases, the sealing efficiency increases proportionally.

(5) D.U.bushings on the pumps provide infinite life within the designed load range. Unlike antifriction bearings, D.U.bushings do not present a B10 life problem. Teflon and pressure lubrication contribute to an indefinite operating life as long as the system is properly maintained.





6) INLET OIL BUSHING LUBRICATION

The design of this pump is such that cooler inlet oil is routed to **flood** the D.U.bushings with oil. Lubricating **scrolls** in the bushing bores create a pumping action which eliminates the need to force high pressure leakage to the journals. This allows the pump to run cooler, with higher volumetric efficiency.

7) DRIVE CONDITIONS

(1) With a choice between taper, splined or parallel keyed shafts; this gear pump is suitable for a wide range of direct or indirect drive applications.

(2) For direct drive applications a flexible compensating three piece coupling is recommended to ensure no radial or axial loads are transmitted to the pump shaft.

(3) When proposing to use belt or gear drive, details of the application should be submitted for out technical appraisal. For applications which exceed permitted limits, an outrigger bearing can be provided to protect the pump.

(4) Plug in spline drive can impose severe radial loads on the pump shaft when the mating female spline is rigidly supported. Undersize splines do not alleviate this condition. The use of plug in drives is permissible providing that concentricity between the female spline and pilot diameter is within 0.10㎜(0.004in). The drive should be lubricated by flooding with oil or by an oil mist.

(5) Both concentricity and angular alignment of shafts are important to pump life. Misalignment can induce heavy side loads on bearing and seals, causing premature failure.

8) FILTRATION

A full flow 10 micron filter with no permanent bypass should be used in the system return line to trap all contaminants before they enter the reservoir. Additionally, a 125 micron screen is recommended to be used in the inlet line of this pump.

9) OPERATING TEMPERATURES

With Buna seals and normal operating conditions, the system temperature should not exceed 82。C (180。F) except for short periods to 93。C(200。F).

10) FLUIDS

A mineral based fluid is recommended with additives to resist corrosion, oxidation and foaming. The oil should have the maximum viscosity commensurate with system pressure drop and pump suction levels. The viscosity at any running condition must be between 45 SSU minimum and 250 SSU maximum continuous.

Since the hydraulic fluid serves as a system lubricant as well as for power transmission, careful selection is important for proper operation of the unit and satisfactory life of the pump and components.

2. REMOVAL AND INSTALL

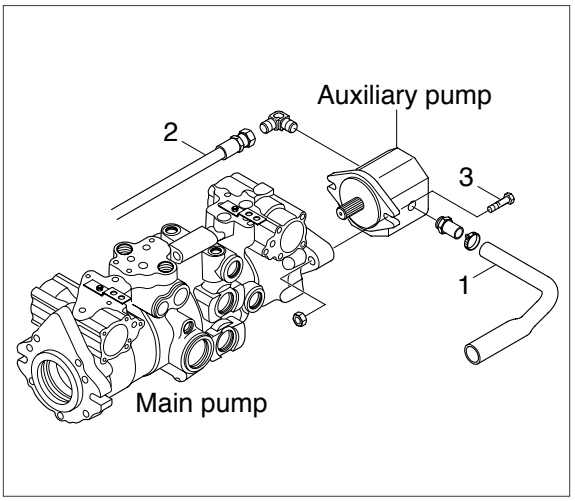
1) REMOVAL

⚠ If engine is running or full up pressure into hydraulic system, absolutely does not repair or tighten hose, fitting.
As hydraulic line explode, dangerous accident may occur.

(1) Lowered the bucket on the ground.

(2) Shut off engine and raise the seat bar and move pedals until both pedal lock.

(3) Tilt canopy and remove the front cover.
※ For tilting and lowering of the canopy, refer to page 4-14 of the operator's manual.



(4) Disassemble inlet hose(1) of auxiliary pump and oil tank.

(5) Disassemble outlet hose(2) of auxiliary pump.

(6) Loose two bolts(3) joined main pump and gear pump.

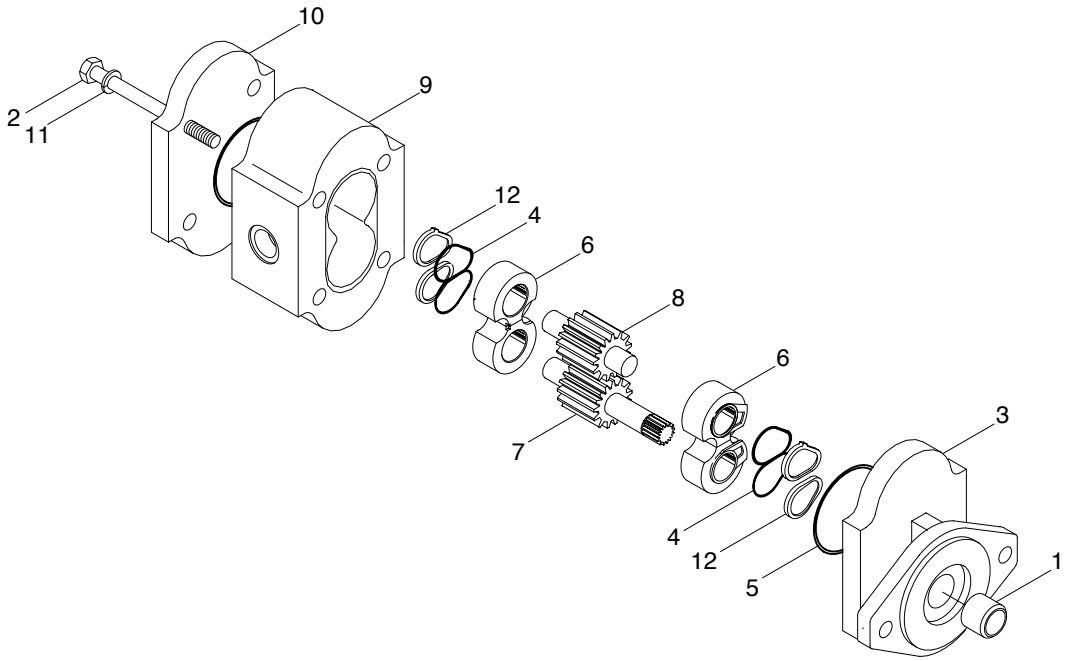
(7) Disassemble gear pump from main pump.

2) INSTALL

(1) Join gear pump to main pump, tighten with bolt(3).
· Tightening torque : 3.7~4.2kgf · m

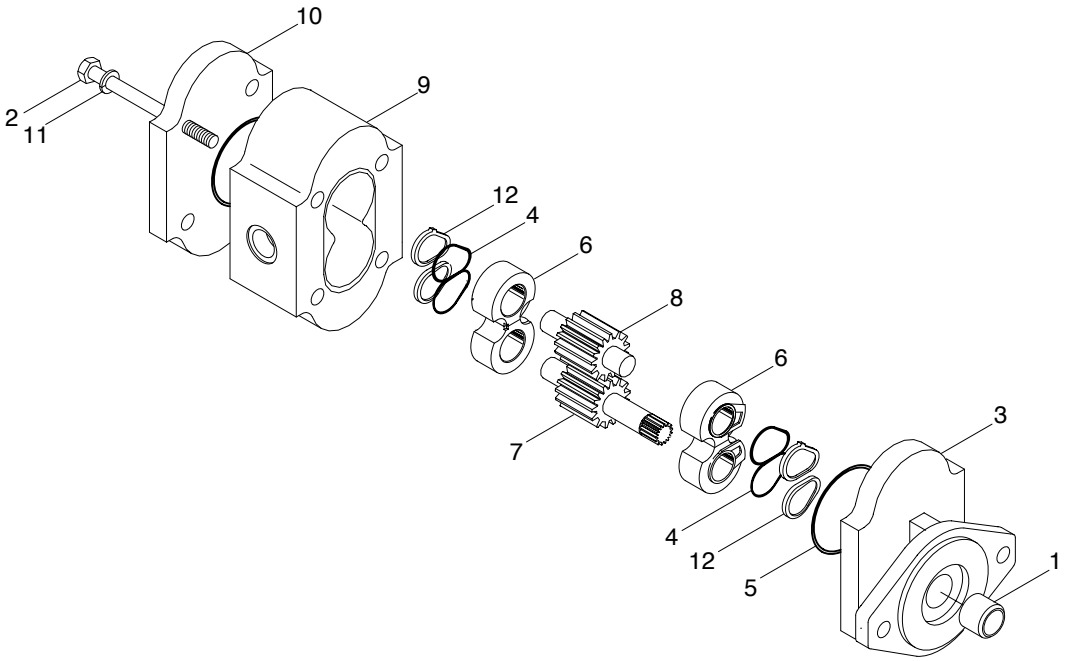
(2) Assemble hose inlet hose(1) and outlet hose(2).

3. DISASSEMBLY



1) Remove port plugs and drain oil from pump.
2) Use a permanent marking pen to mark a line across the mounting flange, gear housing and end cover. This will assure proper reassembly and rotation of pump.
3) Clamp mounting flange in a protected jaw vise with pump shaft facing down.
4) Loosen the four metric hex head bolts.
5) Remove pump from vise and place on clean work bench, remove the four hex head bolts and spacers if applicable.
6) Carefully remove gear housing and place on work bench. Make sure the rear bearing block remains on the drive and idler shafts.
7) Remove rear bearing block from drive and idler shafts.
8) Remove idler shaft from bearing block.
9) Remove drive shaft from mounting flange. There is no need to protect the shaft seal as it will be replaced as new item.
10) Remove the front bearing block.
11) Turn mounting flange over, with shaft seal up, and remove the retaining ring with proper snap ring pliers.
12) Remove the oil seal from mounting flange, be careful not to mar or scratch the seal bore.
13) Remove seals from both bearing blocks and discard.

4. REASSEMBLY



1) Fit new shaft seal to pump flange: press in squarely with a little grease and the spring side inner most.
2) Place the body on a clean flat surface with the flange end uppermost.
3) Assemble the gears with the bearings separately. At this stage do not fit the seals in the bearing outer faces. Ensure the extended bush is facing upwards on the drive gear side.
4) Lightly lubricate the body bore and assemble gear/bearing pack.
5) Fit pressure loading seal and backing ring to flange end bearing ensuring the seal ends are properly located against the body.
6) Fit a sleeve or thin tape over the shaft end then fit the flange, locating on the extended bush. Invert the pump and hold flange in a soft jawed vice.
7) Fit the pressure loading seal and backing ring to the cover end bearing, again ensuring the correct fitment or the seal ends.
8) Fit the cover then assemble washers and bolts finger tight.
9) With the inlet port open, apply an air pressure of 4.8~5.2bar to the outlet port.
10) Tighten bolts to a torque of 61~68Nm and then test.