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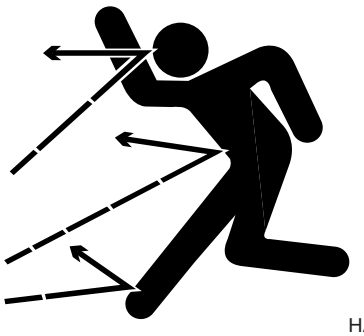
Flying or Falling Objects

On work sites where there is a potential hazard that flying or falling objects can come in contact with operator's cabin, select and use a guard to match operating conditions for additional operator protection.

Working in mines, tunnels, deep pits, and loose or wet surfaces, can produce hazard of falling rocks or flying objects. Additional protection for operator's cabin may be required such as a Falling Object Protective Structure (FOPS) or window guards. Contact your DOOSAN distributor for information on available protective guards.

To prevent personnel from being struck by flying objects, keep personnel out of work area.



HAOA110L

Figure 2

HAOA100L

Figure 3

Personal Protective Equipment (PPE)

Do not wear loose clothing and accessories. Secure long hair. These items can snag on controls or on other parts of equipment.

Do not wear oily clothes. They are highly flammable.

Do not forget that some risks to your health may not be immediately apparent. Exhaust gases and noise pollution may not be visible, but these hazards can cause disabling or permanent injuries. Breathing masks and/or ear protection may be required.

Wear a hard hat, safety shoes, safety goggles, mask, leather gloves, earplugs and other protective equipment, as required.

While working on machine, never use inadequate tools. They could break or slip, or they may not adequately perform intended functions.

HAOA020L

Figure 4

Correction of Machine Problems

If any machine problems are found during operation and maintenance (noise, vibration, smell, incorrect gauges, smoke, oil leakage, etc.), or if any abnormal warming alerts are displayed on display monitor, stop the machine immediately and take the necessary corrective actions. Do not operate the machine until problem has been corrected.

Equipment Lowering with Engine Stopped

Before lowering any equipment with the engine stopped, clear the area around the equipment of all personnel and bystanders. The procedure to use will vary with the type of equipment to be lowered. Keep in mind most systems use a high-pressure fluid or air to raise or lower equipment. The procedure will cause high-pressure air, or hydraulic pressure, or some other media to be released to lower the equipment.

Wear appropriate personal protective equipment and follow the procedures in the Operation and Maintenance Manual.

Preventing Risk of Injuries or Death From Boom and Bucket

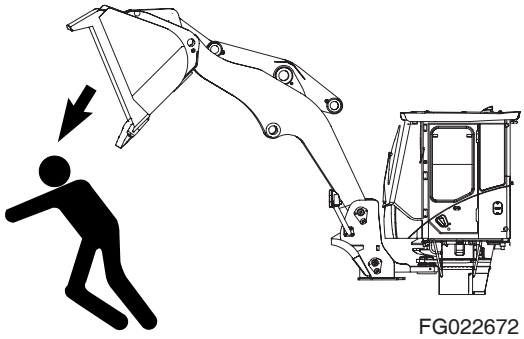
DANGER

AVOID DEATH

When operating machine or making repairs, never allow bystanders in work area or repair area. Operation and service personnel must be careful when working around machine, especially around boom and bucket and articulation joint.

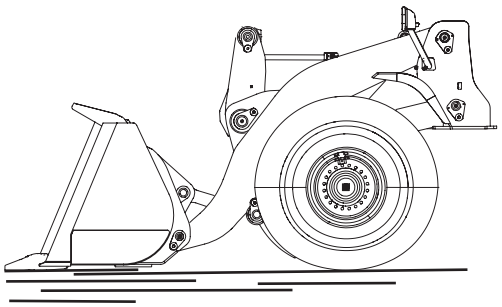
An unexpected lowering of front structure can cause death or serious injury.

1. While operating a machine, do not let people enter the work area. A sudden collapse of front structure caused from a hydraulic hose failure can result in death or serious injury.
2. When stopping or parking machine, lower front structure to ground. If this is not done, sudden collapse of front structure caused from a hydraulic hose failure can result in death or serious injury.



FG022672

Figure 27



FG019359

Figure 28

When starting the engine (particularly after long layoff or storage intervals), make sure that all hydraulic controls and operating circuits are in neutral, or "OFF." That will prevent pumps or other components that may be temporarily oil starved from being run under a load.

Replacement of any hydraulic system component could require thorough cleaning, flushing, and some amount of prefilling with fresh, clean oil if the protective seal on replacement parts has obviously been broken or if seal integrity may have been compromised. When protective seals are removed before installation and reassembly, inspect all replacement parts carefully, before they are installed. If the replacement part shows no trace of factory prelube or has been contaminated by dirt or by questionable oils, flushing and prefilling with clean hydraulic fluid is recommended.

Vibration, irregular or difficult movement or unusual noise from any part of the hydraulic system could be an indication of air in the system (and many other types of problems). As a general precaution (and to help lessen the risk of potential long-term damage), allow the engine to run at no-load idle speed immediately after initial start-up. Hydraulic fluid will circulate, releasing any air that may have been trapped in the system before load demands are imposed.

Before starting the machine, a daily walk-around safety inspection, including a quick visual inspection for any exterior evidence of leaking hydraulic fluid, can help extend the service life of system components.

IMPORTANT

Hydraulic system operating conditions (repetitive cycling, heavy workloads, fluid circulating under high-pressure) make it extremely critical that dust, grit or any other contamination be kept out of the system. Observe fluid and filter change maintenance interval recommendations and always preclean any exterior surface of the system before it is exposed to air. For example, the reservoir fill cap and neck area, hoses that have to be disassembled, and the covers and external surfaces of filter canisters should all be cleaned before disassembly.

Removal of Input Shaft, Output Shaft, Pump Shaft (PTO-shaft) and Clutches

1. Force out both cylindrical pins (1, Figure 64).

   Remove bolts (2, Figure 64) between housing front and rear part and separate housing rear part using lifting device.

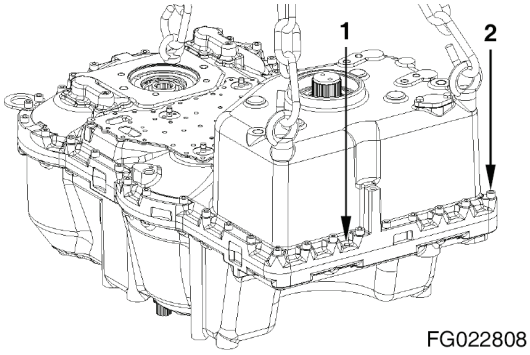


Figure 64

2. Remove bolts (1, Figure 65) attaching oil screen sheets.

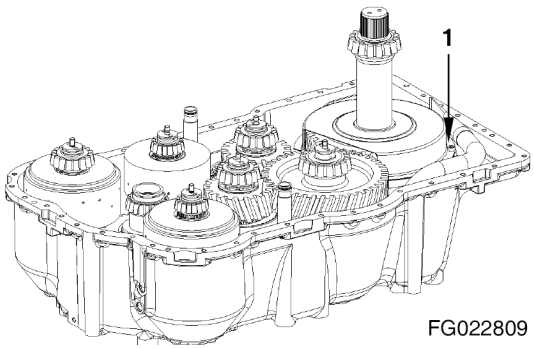


Figure 65

3. Remove output shaft (1, Figure 66) and lower oil screen sheet (2, Figure 66) from housing.

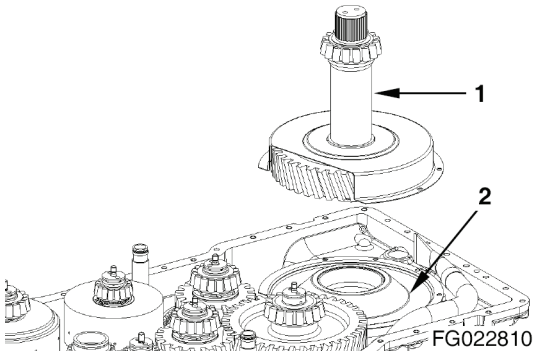


Figure 66

4. Remove all rectangular rings (1, Figure 67) from the clutches and all O-rings (2, Figure 67) from the oil tubes.

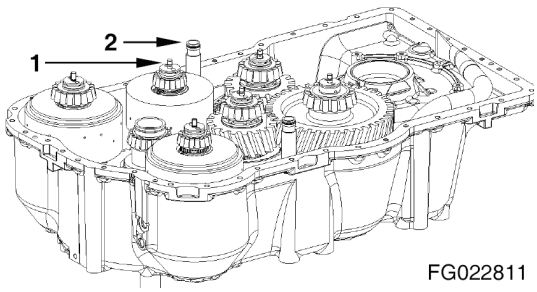


Figure 67

5. Use a hand-operated press to place piston into the disk carrier using the assembly aid.

   (S) Assembly aid 5870 345 088

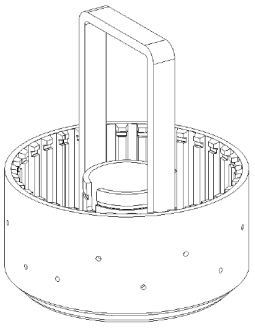


Figure 264

6. Mount inner installer (S) onto the disk carrier.

   Install cup spring package (1) and L-ring (2).

   NOTE: *Installation position cup spring package and L-ring see Figure 267.*

   (S) Inner installer→see Figure 266.

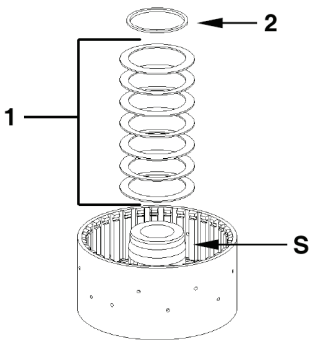


Figure 265

7. Preload cup spring package using assembly aid (S1, Figure 266) and pressure piece (S2, Figure 266), until L-ring has engaged into the annular groove.

   (S) Assembly aid 5870 345 088

   (S) Assembly fixture 5870 345 124
   (Inner installer and pressure piece)

   NOTE: *It is always necessary to use a new L-ring.*

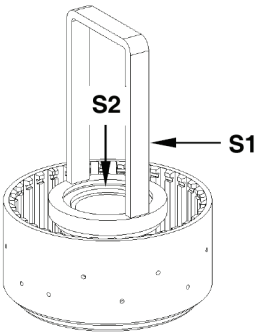


Figure 266

Disk carrier with piston retraction:

Reference Number	Description
1	Cup Spring Package
2	L-ring
3	Disk Carrier
4	Piston with O-rings

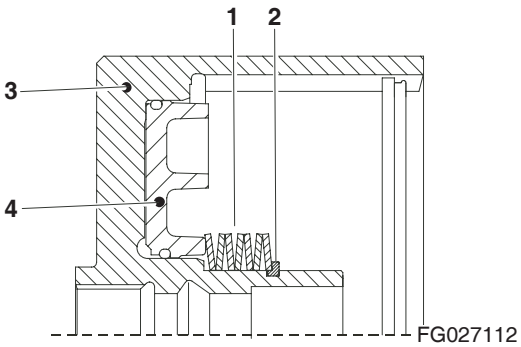


Figure 267

Servicing Rotor Assembly

Disassemble brake as previously described.

1. Using a sharp knife, make several cuts through the outside diameter of the rigid plastic rotor cover. Break apart the plastic, remove and discard.
2. Discard the stainless steel insert from under the plastic cover.
3. Thoroughly clean all dirt and grease residue from the rotor.
4. Apply grease to one face of the new stainless steel insert and place it into the new rotor cover, grease to plastic. Apply grease to the other face of the insert.
5. To assemble the new plastic rotor r-over a bench vise is necessary. Snap a friction pad onto the plastic cover. Place the plastic cover over the rotor, place in a vice, and slowly squeeze the cover and rotor until cover snaps in place. Remove friction pad and reassemble the brake as previously described.

NOTE: *Mount bushing O-rings are also furnished in the rotor service kit. For installation see "Replacing Mount Bushings."*

Parts List

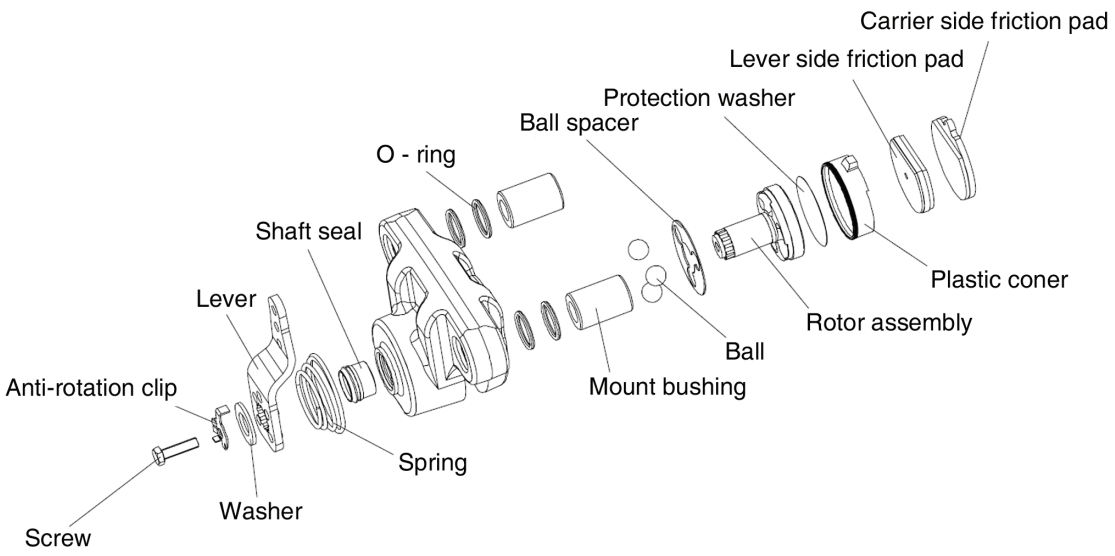


Figure 455

General

Defects or damage identified on parts that are not listed must be rectified or the parts must be replaced with original spare parts.

If you need more information or more detailed instructions, you should contact the machine or brake manufacturer.

4. Remove spider shafts and axle bevel gears (see Figure) out of the differential housing.

Figure 67

5. Remove second axle bevel gear.

Figure 68

6. Lift the pressure ring out of the differential housing and remove disk package and thrust washers behind.

Figure 69

7. Press crown wheel from the differential carrier.

Figure 70

GENERAL DESCRIPTION

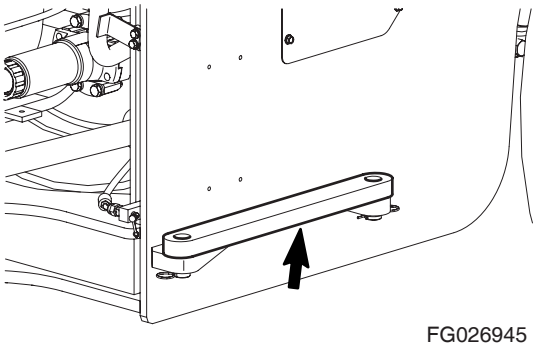
The loader frame is an articulated type: the front frame is joined to the rear frame with two hinge pins around which the loader pivots for steering.

WARNING

AVOID DEATH OR SERIOUS INJURY

Keep out of the articulation area unless the articulated frame lock is installed.

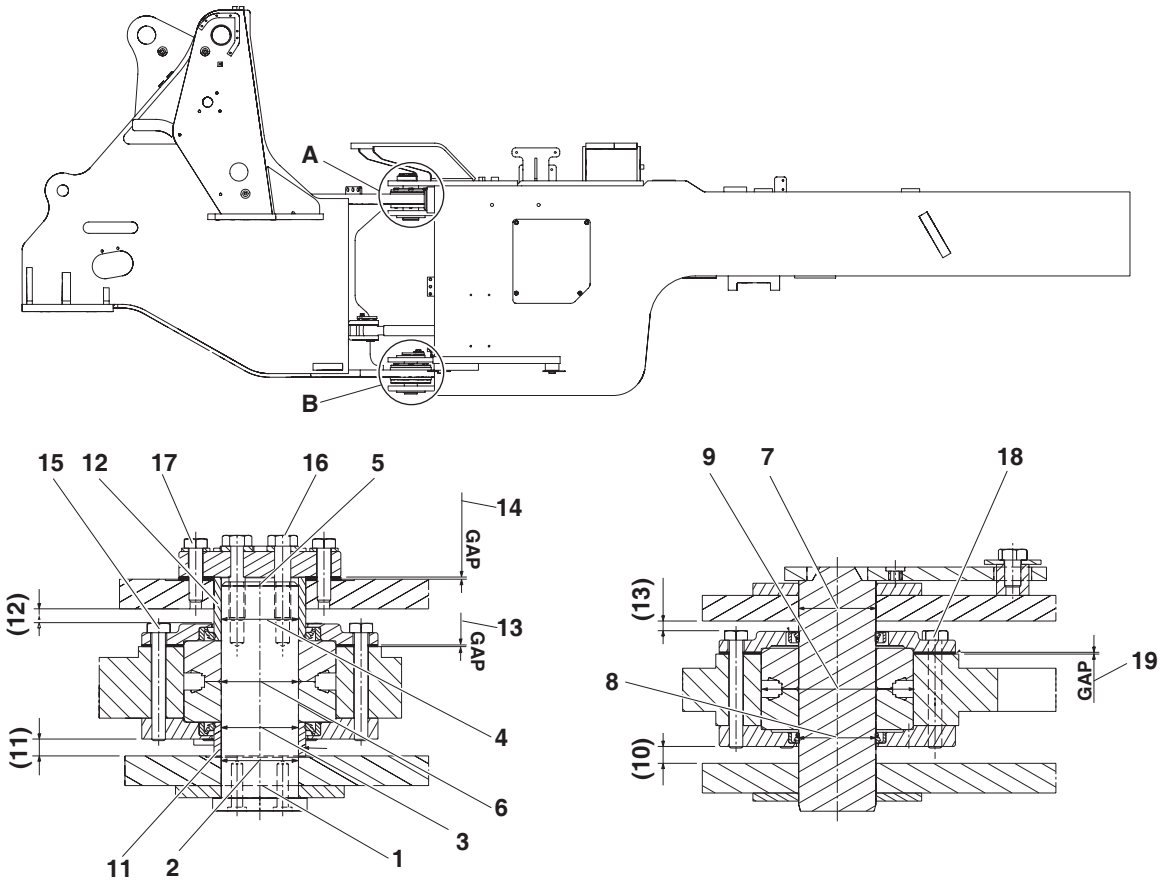
Always install the articulated frame lock before servicing or transporting.



FG026945

Figure 1

Maintenance Standard



SECTION A
(UPPER HINGE BEARING)

SECTION B
(LOWER HINGE BEARING)

FG027140

Figure 2

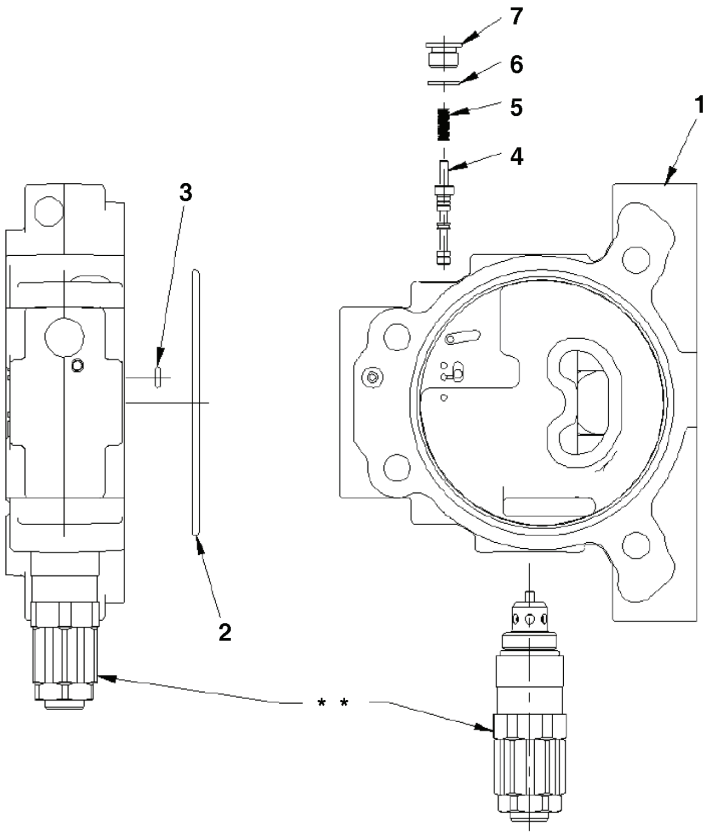


Figure 3 Boom Spool Section

Reference Number	Description
1	Housing
2	O-ring*
3	O-ring*
4	Shuttle

Reference Number	Description
5	Spring
6	O-ring
7	Plug Assembly

* Section O-ring included in service section.

** Not included in service section.

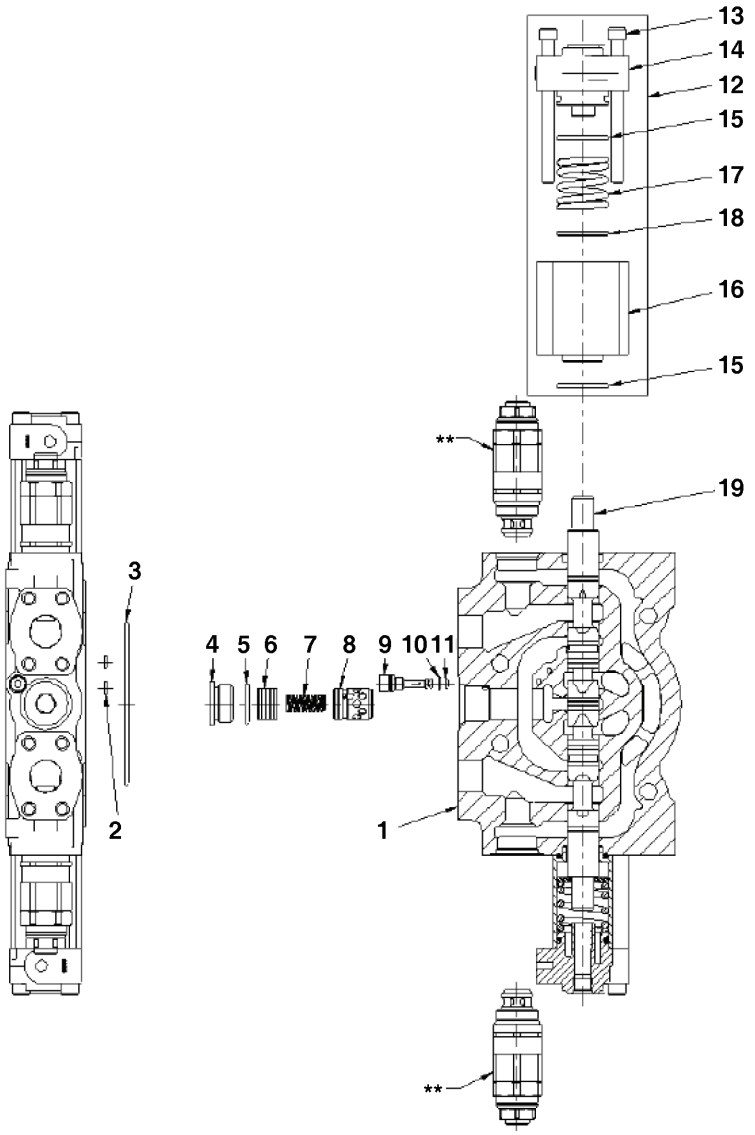


Figure 6

FG027044

Reference Number	Description
1	Housing
2	O-ring*
3	O-ring*
4	Plug Assembly
5	O-ring
6	Spool Compensatorlock
7	Spring
8	Spool Compensator
9	Plug Orifice

Reference Number	Description
10	O-ring
11	O-ring
12	Spool End Group-P.O.
13	Cap Screw-SOC HD
14	End cap-P.O.
15	O-ring
16	Cap Spool P.O.
17	Spring
18	Spacer
19	Spool

* Section O-ring included in service section.

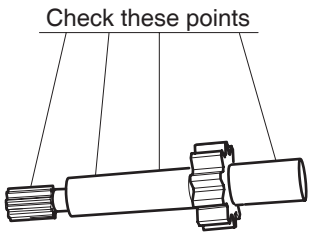
** Not included in service section.

Inspect Parts for Wear

1. Clean and dry all parts thoroughly before inspection.

   It is not necessary to inspect the seals as they will be replaced with new items.

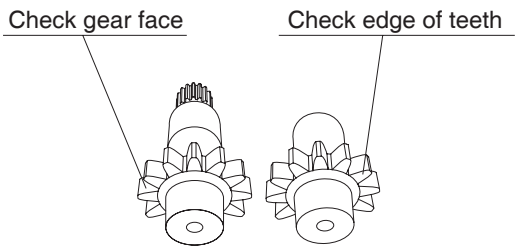
2. Check driveshaft spline for twisted or broken teeth, check keyed driveshaft for broken or chipped keyway. No marks or grooves on shaft in seal area, some discoloration of shaft is allowable.



FG020788

Figure 70

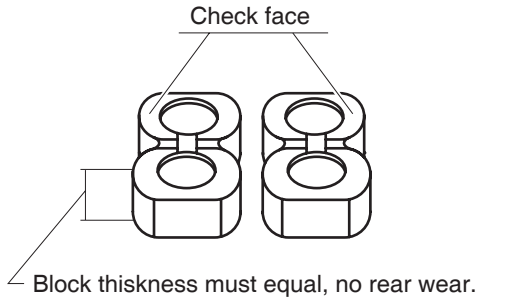
3. Inspect both the drive gear shaft and idler gear shafts at the bearing points and seal area for rough surfaces and excessive wear.



FG020789

Figure 71

4. Inspect gear face for scoring or excessive wear. If the face edge of gear teeth are sharp, they will mill into the bearing blocks. If wear has occurred, the parts are unusable.
5. Inspect bearing blocks for excessive wear or scoring on the surfaces which are in contact with the gears. Also inspect the bearings for excessive wear or scoring.
6. Inspect the area inside the gear housing. It is normal for the surface inside the gear housing to show a clean "wipe" on the inside surface on the intake side. There should not be excessive wear or deep scratches and gouges.



FG020790

Figure 72

Terminal Terms

CN	Term No.	Terms
CN9	1	Temperature control (warm)
	2	Sensor ground
	3	Temperature control Power (5V)
	4	Mix feedback
	5	Power (KEY "ON")
	6	Backup
	7	-
	8	A/C output (LOW)
	9	-
	10	Ground
	11	Illumination
	12	Intake/Recirculate (Recirculate)
	13	Intake/Recirculate (Intake)
	14	Wind direction control (VENT)
	15	Wind direction control (DEF.)
	16	Wind direction control Power (5V)
	17	Wind direction control (feedback)
	18	Temperature control (cool)

CN	Term No.	Terms
CN8	1	Water temperature sensor
	2	Duct sensor
	3	Sun sensor
	4	Ambient air temperature sensor
	5	Internal air temperature sensor
	6	-
	7	-
	8	-
	9	-
	10	D.P.S CHECK
	11	Airflow module (gate)
	12	Blower motor (feedback)

Control Logic

Categories	Inputs	System Operation
AUTO	Set temperature Internal air temperature sensor Ambient air temperature sensor Water temperature sensor Sun sensor	1. Automatically adjust room temperature as set and then next items. Temperature, Wind direction, Recirculate/Intake, Airflow, Compressor 2. Auto mode is released when manually setting any switch except, Temperature Control switch in Auto mode. 3. Upon the releasing of Auto mode, all of functions except selected switch are controlled automatically.

Failure Information Code at Electric Steering Side

Code	Failure Component
S000	1's complement redundancy test
S001	1st boot
S002	Division by zero
S003	CapCom values
S004	Variable truncation
S005	Verified write to cell error
S006	Estimate calibration values error
S007	PWM calibration values error
S008	Mechanical spool compensation values
S009	CRC16 check/Parameter memory
S010	Fall back to old values.
S011	CRC16 check/Program memory
S012	LVDT wiring error
S013	Power supply above specified range
S014	Power supply below specified range
S015	No answer on handshakes
S016	Power-on self test failed
S017	Main spool cannot reach neutral
S018	Main spool cannot reach float position
S019	Main spool not in neutral at boot up
S020	Main spool position is greater than the reference
S021	Main spool position and reference are in opposite directions
S022	Float threshold has not been passed
S023	Time guarding on auxiliary valve command
S024	Illegal CAN address
S025	Command out of range
S026	Scaling error
S027	Ramps error
S028	Float threshold error
S029	Dead band compensation error
S030	Slope error
S031	Shape error
S032	Invert port error
S033	Illegal combination of port flow command and float state
S034	Port flow command above 100%
S035	Illegal valve state
S037	Illegal valve state and illegal port flow command
S038	Illegal combination of inverted ports and float properties