c. Adjusting contact condition at the heel (Fig. 2-370).
Move some shims from the crown wheel side to the opposite side to bring the crown wheel closer to the drive pinion.
Then, increase shim thickness at the bearing cage and move the drive pinion away from the crown wheel.

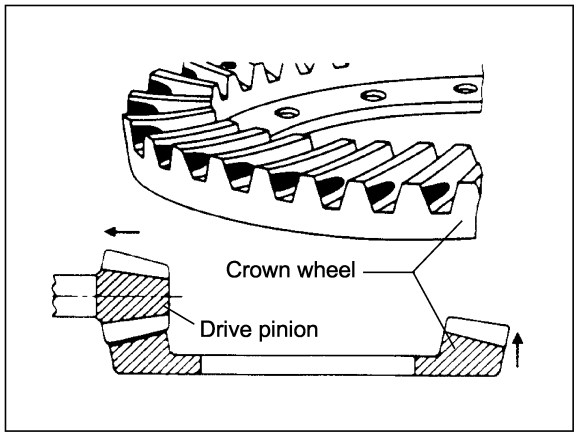

Fig. 2-370

d. Adjusting contact condition at face (Fig. 2-371).
Reduce the shim thickness at the bearing cage to bring the drive pinion closer to the crown wheel.
Then, move some shims from the side other than the crown wheel side to the opposite side to move the crown wheel away from the drive pinion.

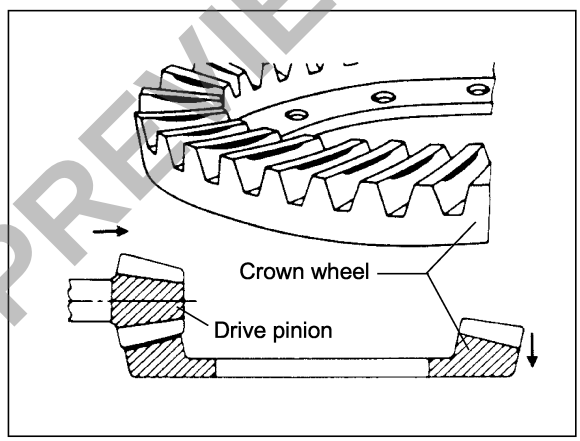

Fig. 2-371

e. Adjusting contact condition at flank (Fig. 2-372).
Increase shim thickness at the bearing cage to move the drive pinion away from the crown wheel.
Then, move some shims from the crown wheel side to the opposite side to bring the crown wheel closer to the drive pinion.

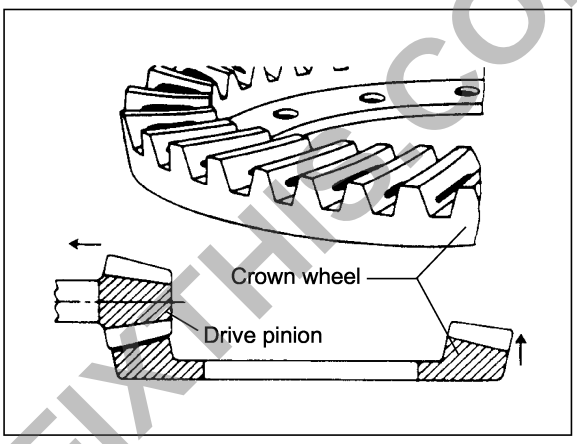

Fig. 2-372

g) Installing the brake assembly.

1. Install the brake piston ring in the center housing (bearing retainer).

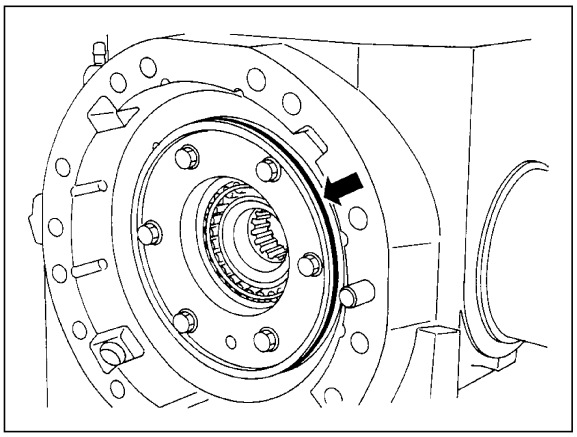

Fig. 2-373

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ATTACHMENT HYDRAULIC SYSTEM
Sealed type with anti-cavitation and safety valves.
- Flow at rated speed ..... 165 lt/min

2 or 3 spool control valve
Mechanical or piloted control
Hydraulic double-acting cylinders:
- Boom control 2
- Bore x stroke ..... 120 x 665 mm

- Bucket control cylinder
- Bore x stroke ..... 150 x 431 mm
- Pressure relief valve setting ..... 210 ± 10 bar
- Lift safety valve setting ....230 ± 10 bar
- Bucket roll-back safety valve setting .... 230 ± 10 bar
- Bucket roll-out safety valve setting .... 160 ± 10 bar

Three-position control switch as follows:
Position 0: disengaged
Position 1: LTS engaged with speeds exceeding 5 kph
Position 2: (to be used only for maintenance or repair) LTS engaged at all times, even with speed lower than 5 kph.
- Accumulator safety valve setting ..... 120 bar

ELECTRICAL SYSTEM
Operating voltage ..... 24 V
Batteries in series 2
- maintenance -free type

BOSCH starter motor
Rated power ..... 4 KW
BOSCH alternator with voltage regulator ..... 55 A

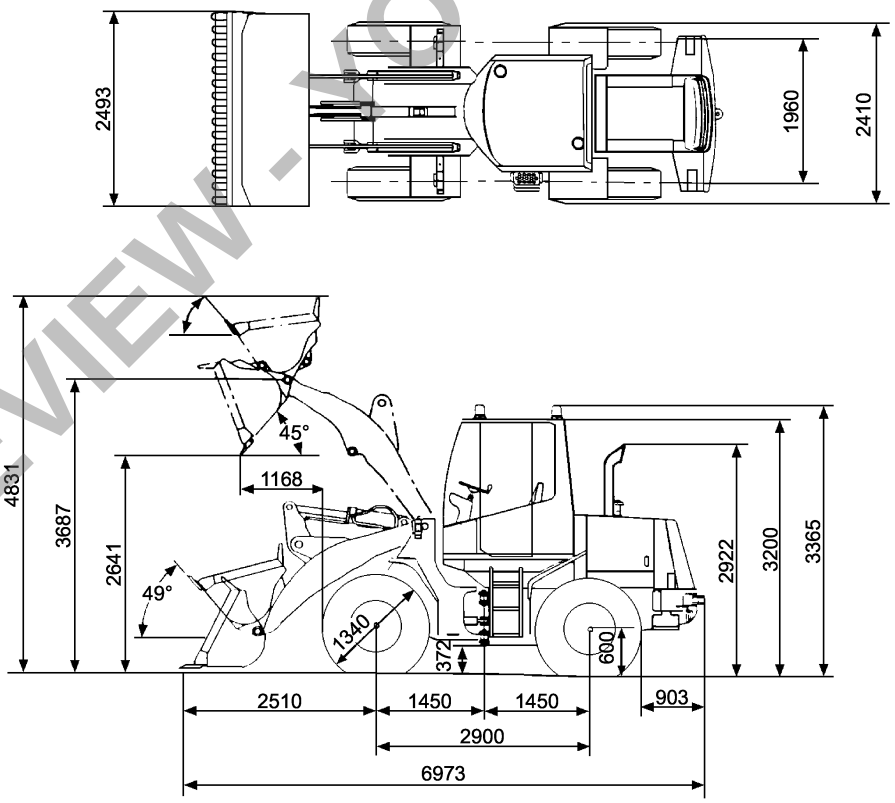
OPTIONS
Electronic anti-pitch LTS (Load Travel Stabiliser) system.

WEIGHT
Loader weight with 17.5 R25 tyres, 2 m^3 bucket, fully filled with fluids and operator kg.

MAIN DIMENSIONS

Dimensions taken with machine with the loader fitted with 17.5 R25 tyres and 2 m^3 load capacity bucket.

Unit of measure: mm



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c) Installing the differential assembly.

1. If the differential bearing was replaced with a new one, press bearing cups on the 2 bearing retainers.

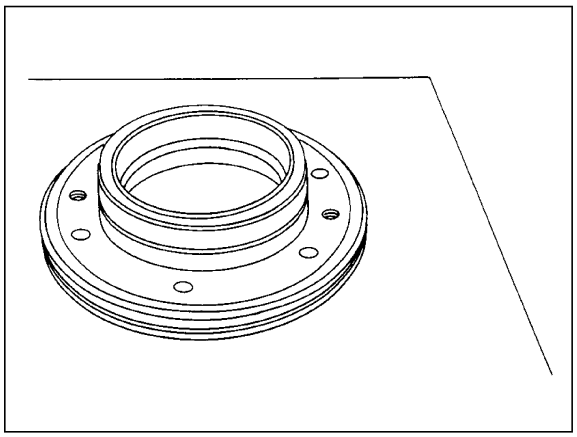

Fig. 2-354

2. Lift the reassembled differential assembly with a hoist and put it in the center housing, aligning the crown wheel with the notch in the center housing.

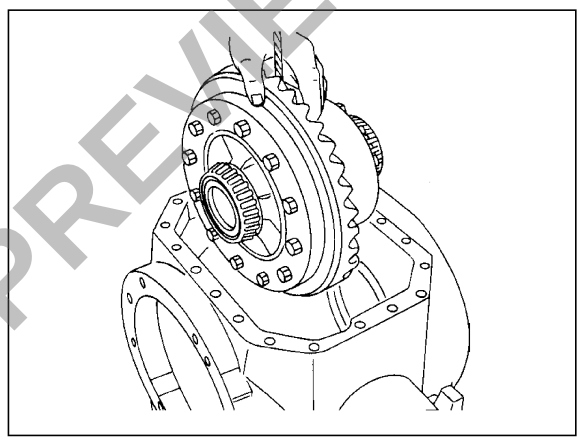

Fig. 2-355

3. Install the box rings and shims on the 2 bearing retainers. Use shims of the same size as was removed during disassembly.

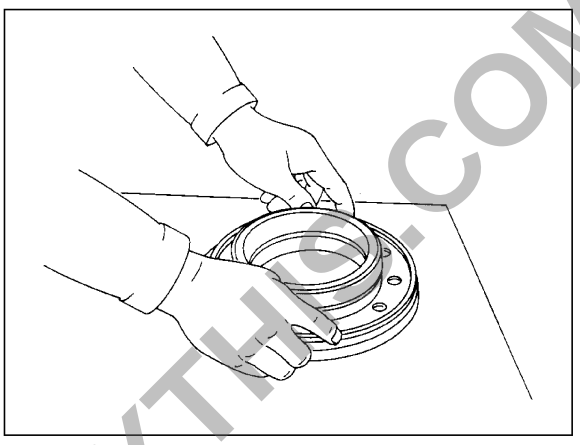

Fig. 2-356

4. Install the bearing retainers at the right and left sides of the center housing to hold the differential case. Temporarily install the bearing retainer mounting bolts (8 off).

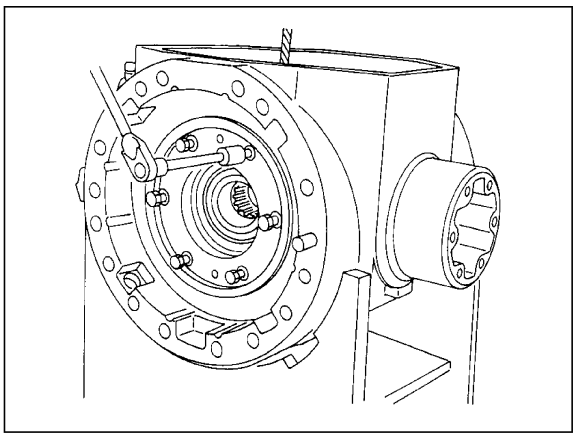

Fig. 2-357

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SERVICE MANUAL

Wheel Loaders LW110 - LW130 - LW130TC

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e) Removing and Disassembling Converter Wheels (LW110)

1. Remove the eight bolts securing the input plate and remove the plate.

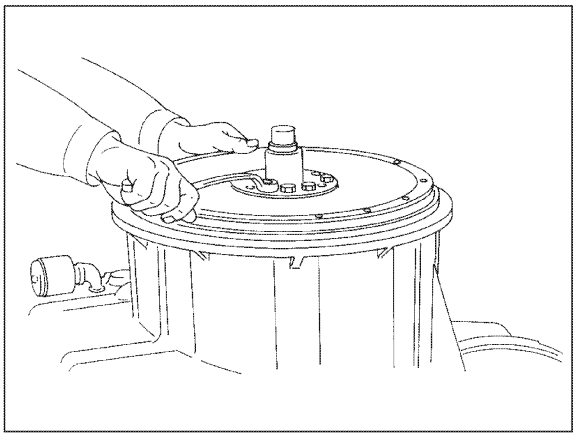

Fig. 2-62

2. Remove the 24 bolts securing the front cover and remove the cover with two puller bolts.

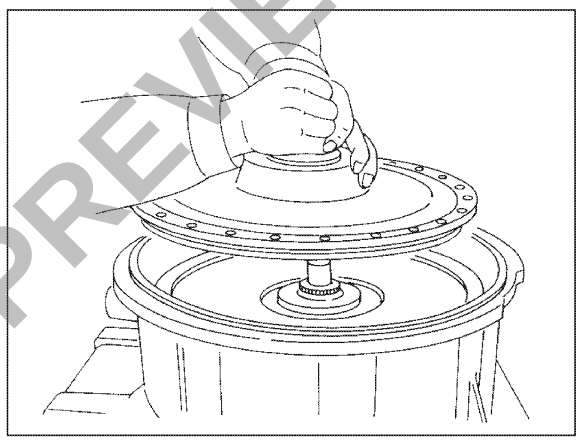

Fig. 2-63

3. Remove the snap ring from the turbine shaft and remove the turbine, holding the rivet head with pliers.

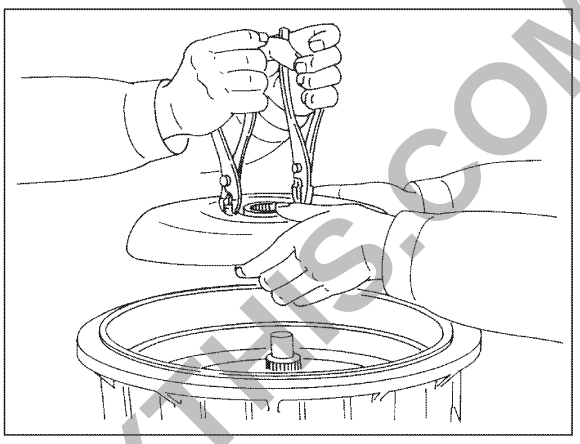

Fig. 2-64

4. Remove the snap ring. Remove the stator wheel and collar.

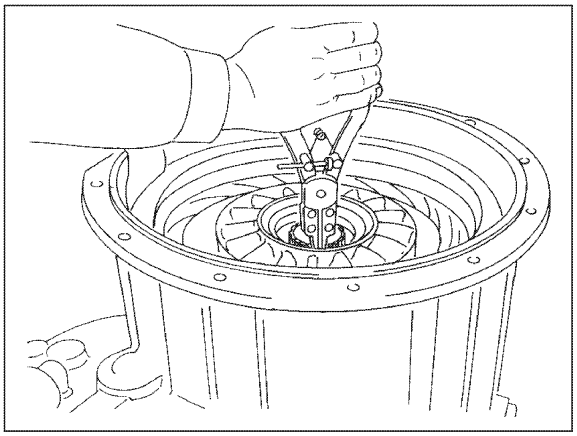

Fig. 2-65

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To convert models LW110 and LW130/130TC from the mechanical transmission version into the automatic transmission version, it is necessary to perform the following operations: JP1

1) An automatic transmission neutraliser switch is mounted on the instrument control panel.

2) Install a proximity sensor on the accelerator pedal.

3) Remove the plug on the transmission and insert the second sensor.

4) The transmission control ATC electronic unit is installed.

5) Disconnect connection “N” and connect it to “N-N”.

6) Add wire 76042597 connected as in fig. 2-40.

7) Remove relays RL9 - RL6.

8) Position switches SW1 and SW2 on the logic board, in the positions indicated here below:

MECHANICAL MODE SELECTION (BASE)

SW1
1 ON
2 OFF
3 OFF
4 OFF

SW2
1 OFF
2 ON
3 OFF
4 OFF

JP1
BRIDGE
2-3

MECHANICAL MODE SELECTION (VARIANT)

SW1 (LW110)
1 OFF
2 ON
3 OFF
4 ON

SW2
1 ON
2 OFF
3 ON
4 ON

SW1 (LW130/130TC)
1 OFF
2 ON
3 OFF
4 OFF

JP1
BRIDGE
1-2

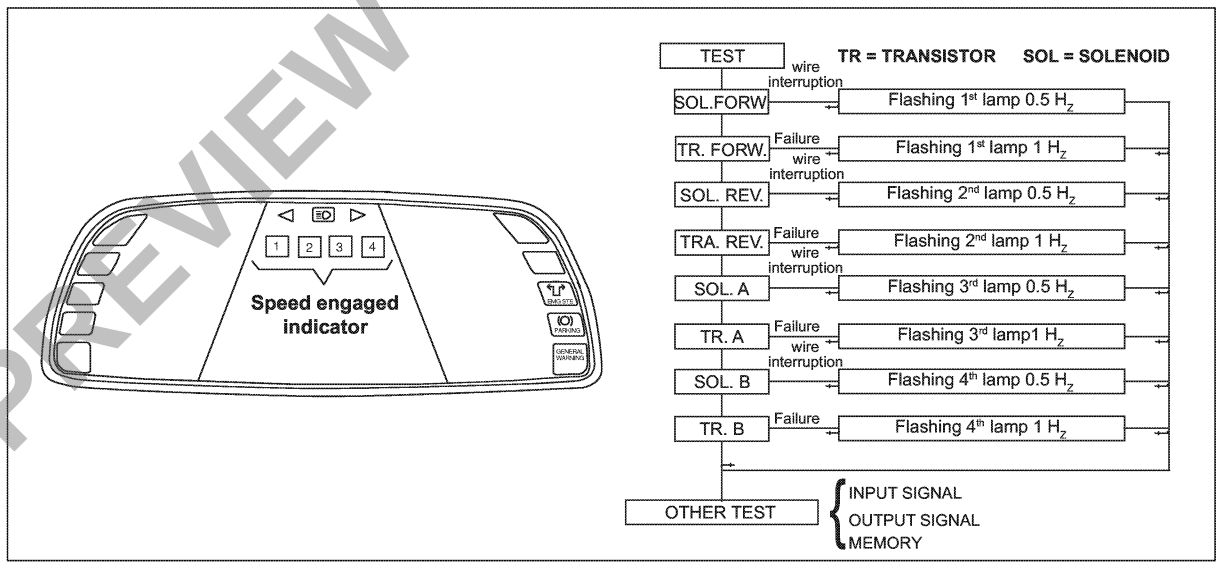

Fig. 2-41 Self-diagnosis of troubles on automatic transmission

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SAFETY PRECAUTION INFORMATION

UNSAFE OPERATING PRACTICES AND IMPROPER USE OF THE MACHINE AND ITS ATTACHMENTS ON THE PART OF THE OPERATOR OR SERVICE TECHNICIAN CAN RESULT IN INJURIES. OBSERVE THE FOLLOWING SAFETY PRECAUTIONS AT ALL TIMES:

1. **FOR SERVICING, THE LOADER SHOULD BE ON LEVEL TERRAIN, ENGINE STOPPED WITH THE WHEELS BLOCKED OR THE ENTIRE MACHINE SOLIDLY SUPPORTED WITH THE WHEELS OFF THE GROUND BEFORE SERVICING ANY COMPONENT OF THE DRIVETRAIN.**

2. **FOR SERVICING UNDER THE OPERATOR'S SEAT, RAISE THE SEAT AND PAN ASSEMBLY TO THE RAISED LATCHED POSITION AND SECURELY LATCH.**

3. **DO NOT OPERATE THE MACHINE UNLESS THE SEAT IS LATCHED IN THE OPERATE POSITION.**

4. **DO NOT SERVICE THE MACHINE WITH A RAISED BOOM UNLESS THE BOOM IS RESTING ON BOOM LOCK PINS OR CYLINDER LOCKING TOOLS OR FIXTURES.**

5. **DO NOT SERVICE THE LOADER WITH THE ENGINE RUNNING UNLESS THE LOADER IS PROPERLY AND SECURELY SUPPORTED WITH ALL FOUR WHEELS OFF THE GROUND.**

6. **USE CAUTION WHEN SERVICING THE UNIT AROUND MOVING PARTS.**

7. **DO NOT TILT THE BOOM AND CAB WITHOUT PROPER INSTRUCTION.**

8. **DO NOT TILT THE BOOM AND CAB WITHOUT USING THE PROPER CAB TILTING TOOL.**

9. **REINSTALL ALL SHIELDS REMOVED FOR SERVICE.**

10. **NEVER LOOSEN ANY HYDRAULIC CONNECTIONS BEFORE RELIEVING THE PRESSURE IN THE HYDRAULIC SYSTEM.**

11. **WEAR EYE PROTECTION SUCH AS GOGGLES, ETC.**

12. **WEAR EAR PROTECTION SUCH AS EARPLUGS, ETC. WHEN YOU FEEL THE NOISE LEVEL IS UNCOMFORTABLE.**

13. **IF ANY SERVICING OR ADJUSTMENTS REQUIRE THE BATTERY TO BE DISCONNECTED, DISCONNECT THE (-) NEGATIVE GROUND CABLE.**

14. **WHEN SERVICING ELECTRICAL COMPONENTS, DISCONNECT THE (-) NEGATIVE GROUND CABLE.**

15. **IF AN ELECTRONIC INSTRUMENT CLUSTER (EIC) REQUIRES REMOVAL FROM THE DASH AREA OR THE MACHINE, DISCONNECT THE (-) NEGATIVE GROUND BATTERY CABLE. THIS WILL SHUT OFF POWER TO THE EIC AND PREVENT DAMAGE TO THE EIC BOARD OR BLOWING FUSES IF THE BOARD IS ACCIDENTALLY GROUNDED.**

16. **IF WELDING IS REQUIRED ON THE MACHINE, DISCONNECT THE (-) NEGATIVE GROUND CABLE. FAILURE TO DISCONNECT THE BATTERY MAY RESULT IN DAMAGE TO THE EIC (ELECTRONIC INSTRUMENT CLUSTER) MONITORING SYSTEM AND OTHER ELECTRICAL COMPONENTS.**

17. **IF WELDING IS REQUIRED ON AN ATTACHMENT, REMOVE THE ATTACHMENT FROM THE MACHINE.**

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OWNER ASSISTANCE

We at New Holland Construction and your New Holland Construction dealer want you to be completely satisfied with your investment. Normally any problems with your equipment will be handled by your dealer's Service Department. Sometimes, however, misunderstandings can occur. If your problem has not been handled to your satisfaction, we suggest the following:

1. Contact the owner or General Manager of the dealership, explain the problem, and request assistance. When additional assistance is needed, your dealer has direct access to our office.

2. If you cannot obtain satisfaction by doing this, contact the New Holland Construction office and provide them with:

- Your name, address, and telephone number
- Machine model and serial number
- Dealership name and address
- Machine purchase date and amount of use
- Nature of problem

NEW HOLLAND CONSTRUCTION

245 E. North Ave

Carol Stream, IL 60188-2021

Tel. No. (630) 260-4000

When contacting New Holland, be aware that your problem will likely be resolved in the dealership using the dealer's facilities, equipment, and personnel. So it is important that your initial contact be with the dealer.

MANUAL CORRECTIONS

If a page in this manual is found to need correction, please fax a marked page to (630)260-4565.

SPARE PARTS

To maintain operating efficiency, use NEW HOLLAND original spare parts.When ordering parts, give the following informations:

- Machine model
- Machine and engine serial numbers
- Part number from the Parts Catalog

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1.8 LUBRICATION SYSTEM

Lubrication: ..... Forced
Lubrication pump: ..... Gear type, driven by crankshaft
Filtering: ..... Total flow and by-pass combined system
Cooling: ..... Built-in water-oil heat exchanger
Oil pressure regulation: ..... Plunger with spring
Quantity of lubricant oil (1st filling): ..... 14.5 kg (31 lb)

The engine parts are lubricated by a forced circulation using an hydraulic pump. The pump sucks the engine oil from the sump and sends it, under pressure, through an oil filter and the heat exchanger, to a manifold in the cylinder block, to be distributed to the various organs of the engine, before returning to the oil sump. Eventual engine oil pressure malfunctions are signalled by the pressure switch or the filter clogging switch, and an indicator light located on the instrument panel in the operator compartment.

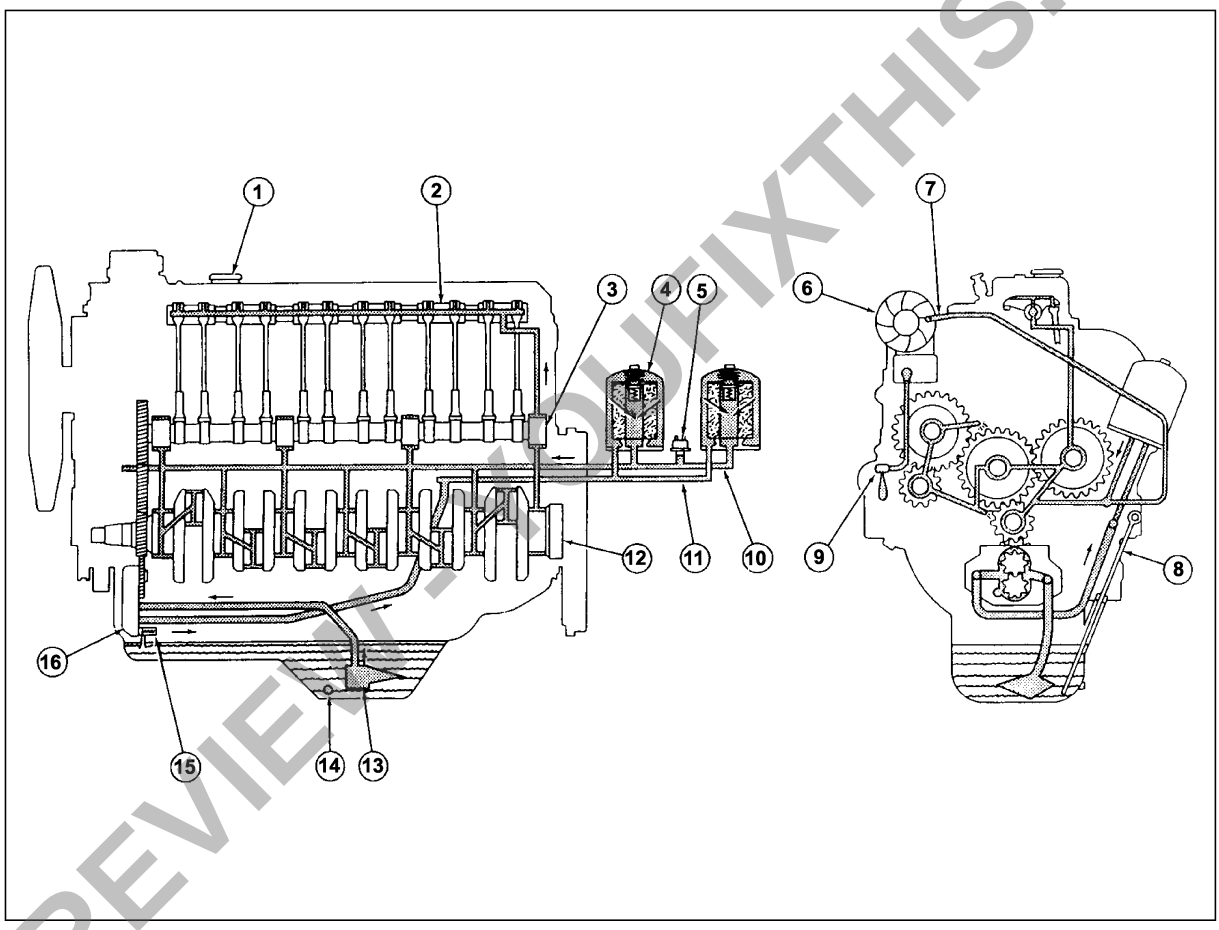

Fig. 1-5 Lubrication system

1. OIL FILLER PLUG
2. ROCKER ARM SHAFT
3. CAMSHAFT
4. OIL FILTER
5. LOW PRESSURE SWITCH
6. TURBO CHARGER
7. OUTER LUBRICATION DUCT
8. OIL DIPSTICK
9. OUTER OIL RETURN PIPING
10. LUBRICATION MAIN DUCT
11. DELIVERY PIPING
12. CRANKSHAFT
13. MESH FILTER ON SUCTION LINE
14. DRAIN PLUG
15. RELIEF VALVE
16. OIL PUMP

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OPERATION

The modulating valve in this control valve changes the time required to increase the oil pressure to the clutch engagement value, i.e. it changes the pressure increment curve, in accordance with the transmission speeds, allowing a smooth gear shifting.

The intervention of the modulating valve is represented in the diagram by points **A - E.** The intervention of the solenoid valves and the manual spool (emergency travel spool) is explained in the pages to follow.

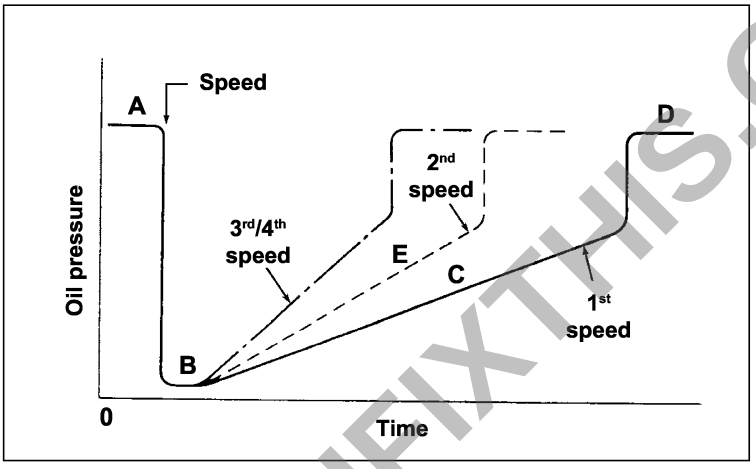

Fig. 2-24 Variation curves of clutches engagement oil pressure

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3. Move the gear a little outward with a chisel (to engage the puller craw with the gear).

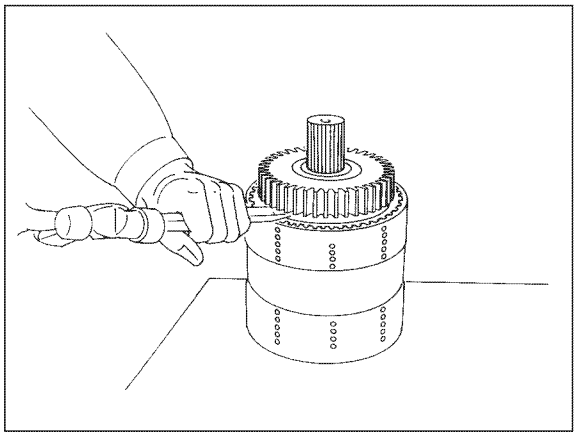

Fig. 2-126

4. Remove the hub gear with a puller.

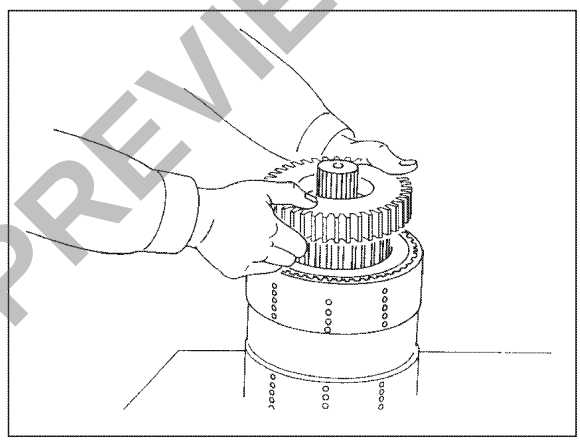

Fig. 2-127

5. Remove the bearing from inside the hub gear with a jig.

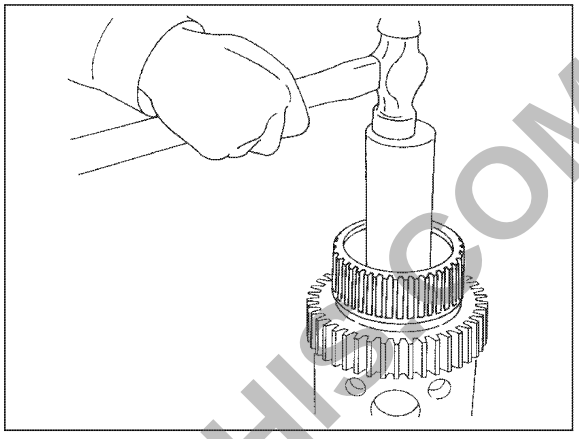

Fig. 2-128

6. Remove the snap ring from the clutch drum inner groove with a screwdriver.

Warning: Pay attention to the end plates which might pop out due to the return spring between the plates.

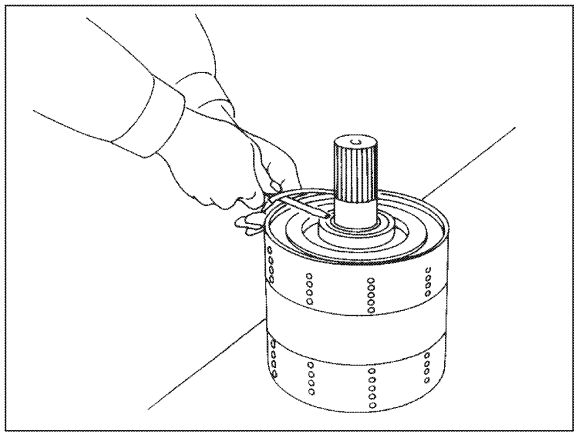

Fig. 2-129

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2.6.3. Troubleshooting guide

2.6.3.1 Torque converter

Problem	Cause	Inspection	Corrective Action
Overheat or lower horsepower	Low oil level	Check oil level with oil level gauge	Add oil to the specified level
	Improper oil used	Check oil type	Change for the specified oil
	Malfunction of cooler line	Check cooling water for dirt	Clean
	Defective oil seal ring	Measure oil pressure at inlet port of torque converter	Disassemble and replace parts
		Check breather for oil flash	Disassemble and replace parts
	Malfunction of safety valve	Measure oil pressure at inlet port of torque converter	Disassemble and replace parts
	Broken bearing	Observe foreign material in transmission drain	Disassemble and replace parts
		Check line filter and oil	Disassemble and replace parts
	Low discharge from charging pump	Check transmission strainer for clogging	Clean
		Measure oil pressure at inlet port of torque converter	Replace pump
		Measure oil pressure of transmission clutch	Replace pump
	Excessive use	Check operating conditions and operation	Use properly
	Transmission failure	Refer to "2.6.3.2 TRANSMISSION"	
Oil leak (from flywheel)	Defective oil baffle oil seal	Check for oil leak to flywheel	Replace parts
	Defective O-ring of oil baffle	Check for oil leak to flywheel	Replace parts
Unusual noises	Broken bearing	Observe foreign material in transmission drain	Disassemble and replace
		Check line filter and oil	Disassemble and replace parts
	Broken gear or improper backlash	Check with sound checker	Disassemble and replace parts
	Broken pump or drive unit	Check with sound checker	Replace pump
	Air in oil	Check oil for air mixed	Retighten piping or replace parts
	Improper oil used	Check oil type	Change for the specified oil

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The measurement position of the height difference (**Y**) is shown in Fig. 2-386.

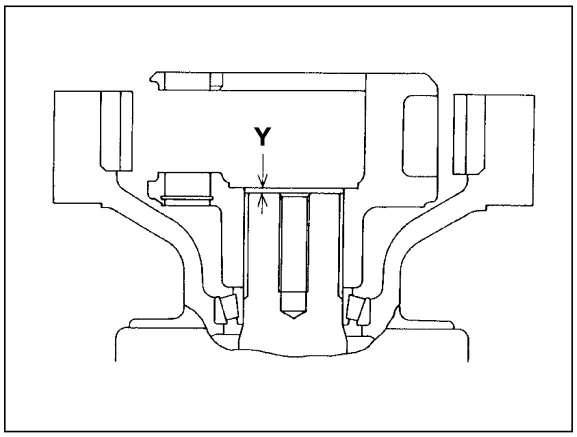

Fig. 2-386

4. Select a shim which is 0.03 to 0.10 mm thicker than the height difference (**Y**).

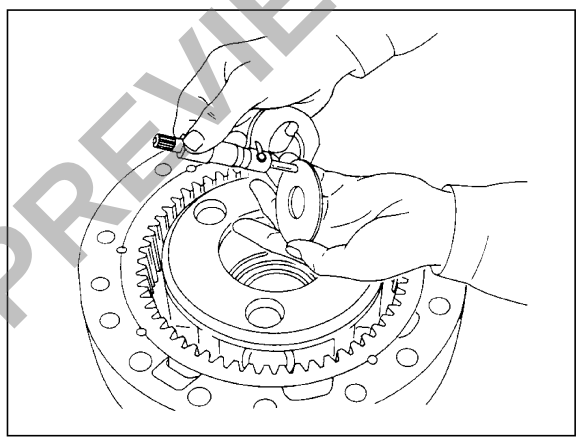

Fig. 2-387

5. Install the selected shim on the axle shaft and the retainer plate in this order. Tighten the bolt.

65.7 kgm

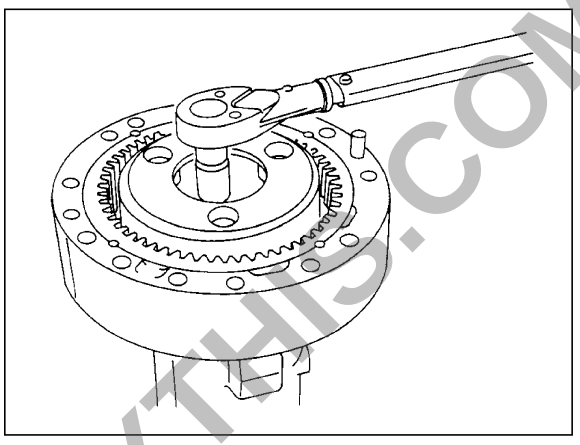

Fig. 2-388

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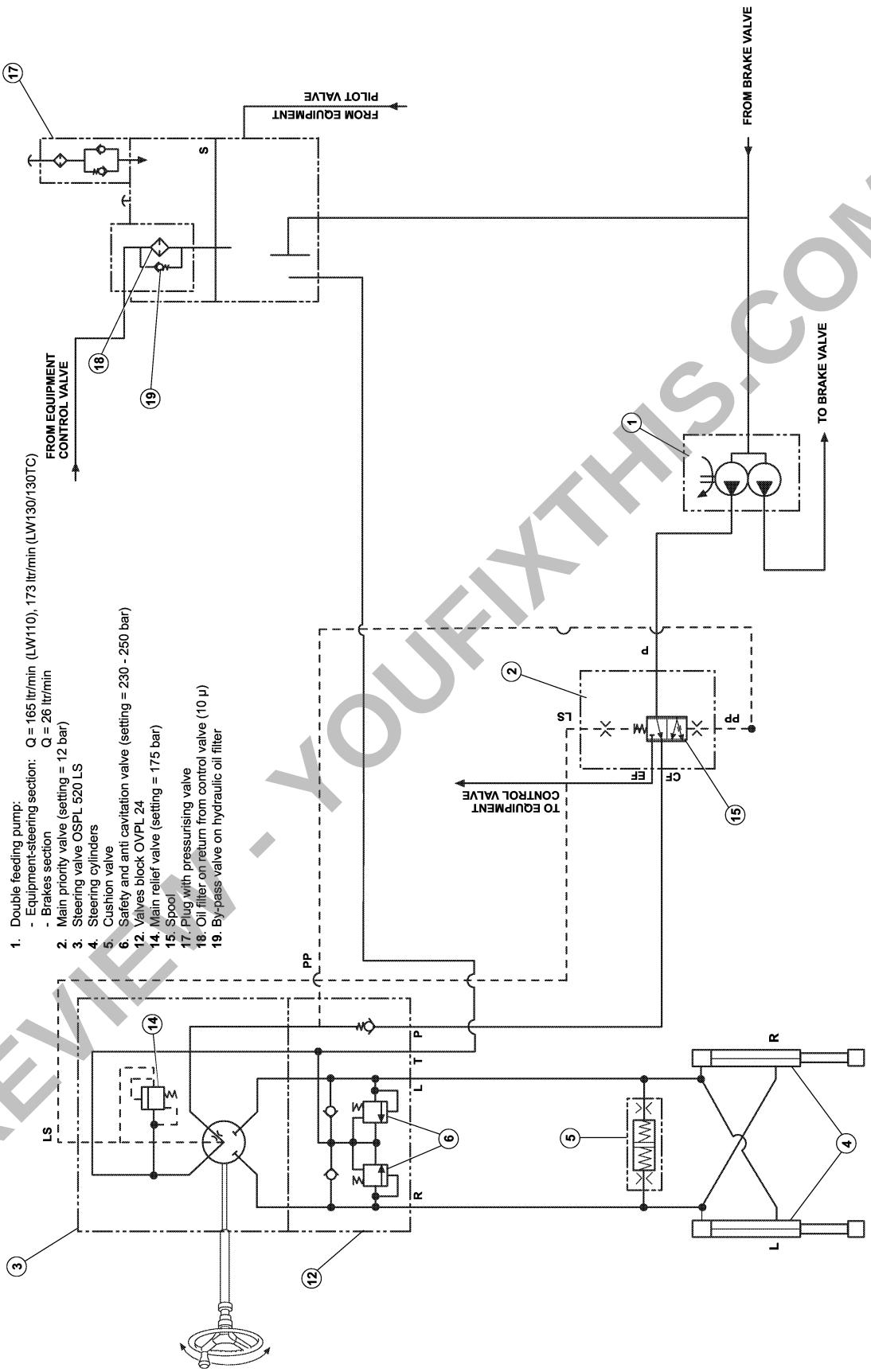
Fig. 4-2 STEERING SYSTEM DIAGRAM

1. Double feeding pump:
   - Equipment-steering section: Q = 165 ltr/min (LW110), 173 ltr/min (LW130/130TC)
   - Brakes section Q = 26 ltr/min
2. Main priority valve (setting = 12 bar)
3. Steering valve OSPL 520 LS
4. Steering cylinders
5. Cushion valve
6. Safety and anti cavitation valve (setting = 230 - 250 bar)
12. Valves block OVPL 24
14. Main relief valve (setting = 175 bar)
15. Spool
17. Plug with pressurising valve
18. Oil filter on return from control valve (10 µ)
19. By-pass valve on hydraulic oil filter



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6.3.1 INSPECTION AND REPAIR OF EQUIPMENT - STEERING PUMP

When disassembling, mark all components so that they can be re-installed in the correct position.
After cleaning each individual item, inspect all the parts of the pump.

1) Gear plate

One of the methods to obtain a better volumetric efficiency of a gear pump is a design allowing the end of the teeth stay in contact with the inner wall of the chamber containing the gear itself. Consequently, once the pump starts running, marks left by the gear teeth are shown around the suction port (fig. 6-6)
The contact mark is normal as long as it is less than 1/2 the inner circumference of the gear cavity.
Dimension **a** of the mark depth (fig. 6-7) is normal if it as about 0.5 mm (.00196 in). When dimension **a** exceeds 0.15 mm (0.00589 in) also the shaft and bearings can wear out. Thus, these items as well, must be thoroughly checked.
If **a** is • 0.15 mm (0.00589 in), replace the pump with a new one.

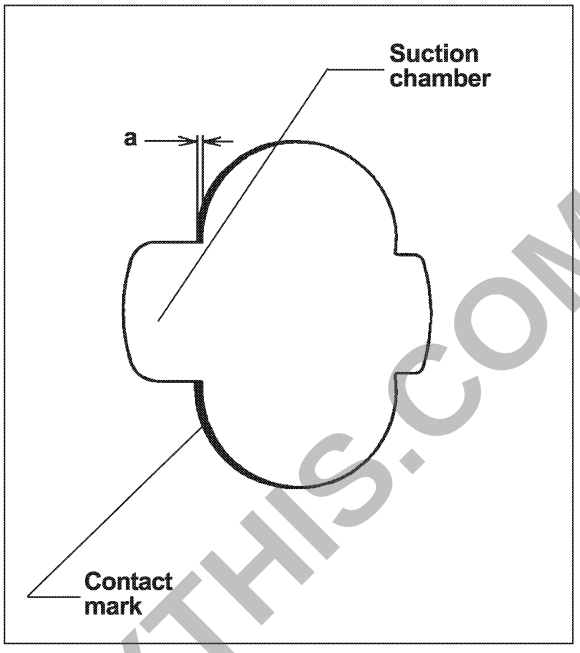

Fig. 6-7 Dimension of mark depth

2) Driving and driven gear

In case the shaft or the gear surface shows roughness felt by running a finger nail, or in case the surface of the teeth shows excessive wear zones, it is necessary to replace the item.
If the shaft diameter **d** is less than 31.627 mm (1.2451 in), replace the set of gears with a new one.

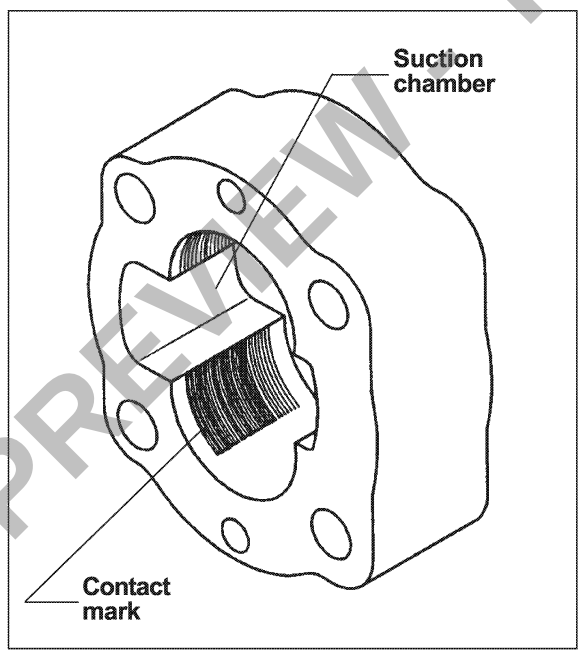

Fig. 6-6 Gear intermediate plate

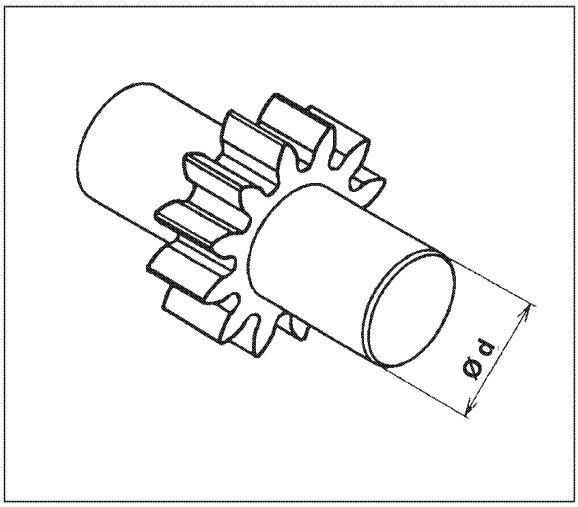

Fig. 6-8

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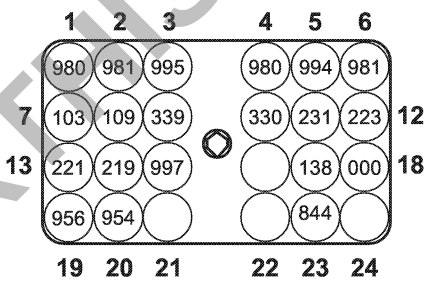
7.3 CONNECTORS

The connectors (**A-B-C-D**) are located in the lower part of the cab, connecting the main wiring to the logic board (**S**).
The coloured wires arrive from the upper side, the numbered wires from the lower side.
On connectors **A-B-C** (fig. connectors) there are 24 connecting points, whereas on connector **D** (fig. connector **D**) there are 18. The description and the function of each wire on the connector has a corresponding number/colour, as it can be found in the description of each connector.

Reference on connector	Description - Function	Colour	Wire
1)	SIGNAL BOOM KICKOUT	–	980
2)	SIGNAL BUCKET POSITIONER	–	981
3)	POWER BOOM KICKOUT PROXIMITY	S–N	995
4)	SIGNAL BOOM KICKOUT	S–G	980
5)	POWER BUCKET POSIT. PROX.	V–B	994
6)	SIGNAL BUCKET POSITIONER	V–N	981
7)	RIGHT TURNING LIGHT	A	103
8)	LEFT TURNING LIGHT	L	109
9)	LEFT HEAD LIGHT	G	339
10)	RIGHT HEAD LIGHT	G–N	330
11)	LEFT LOW BEAM	H	231
12)	RIGHT LOW BEAM	H–N	223
13)	RIGHT HIGH BEAM	V	221
14)	LEFT HIGH BEAM	V–R	219
16)	*	–	–
17)	HORN POWER	C–N	138
18)	GND	N	000
19)	EVENTUAL LTS	Z–N	956
20)	GND EVENTUAL LTS	B–N	954
21)	*	–	–
22)	*	–	–
23)	EMERGENCY STEERING PRESS.		844
24)	*	–	–

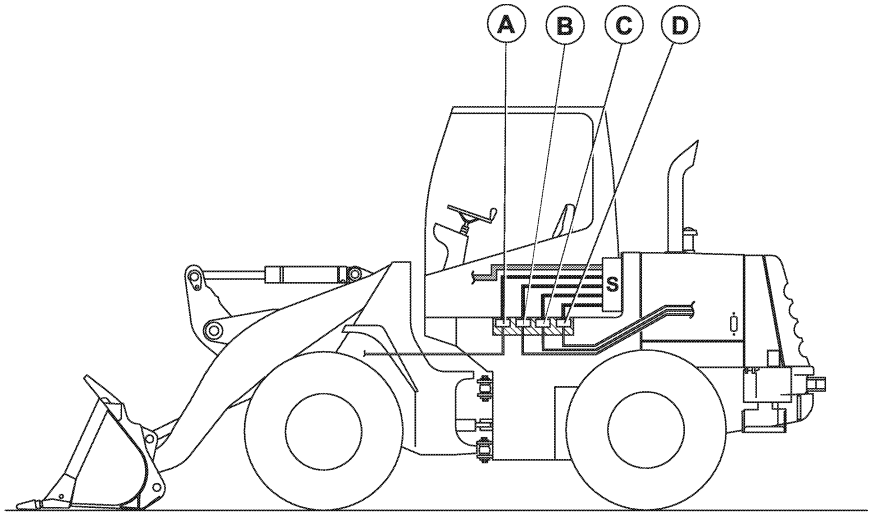
* NOT CONNECTED

CONNECTOR A



Symbol of wires

C =	Orange	N =	Black
A =	Light blue	S =	Pink
B =	White	R =	Red
L =	Blue	V =	Green
G =	Yellow	Z =	Violet
H =	Grey		



A-B-C-D. Connectors

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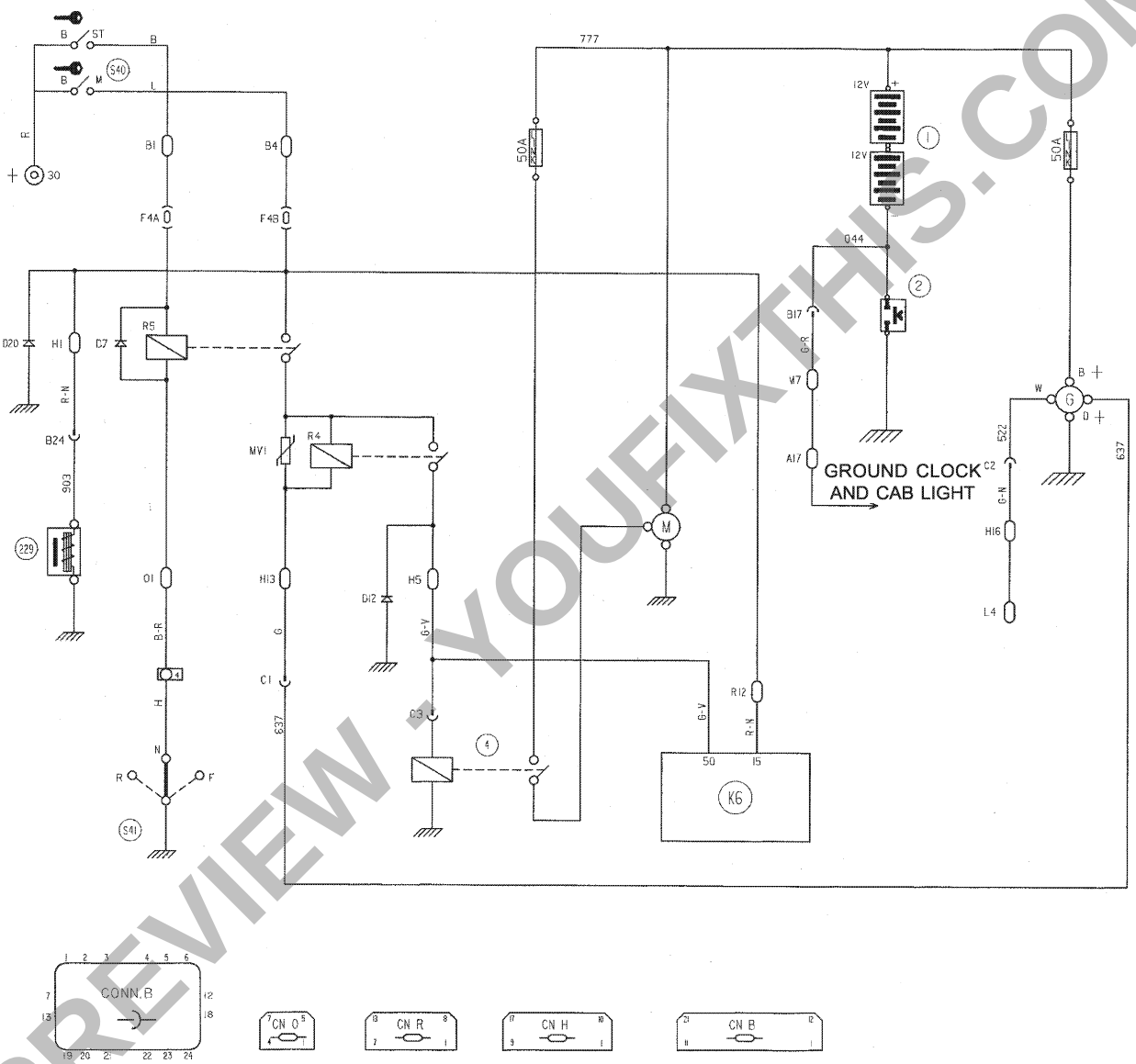

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