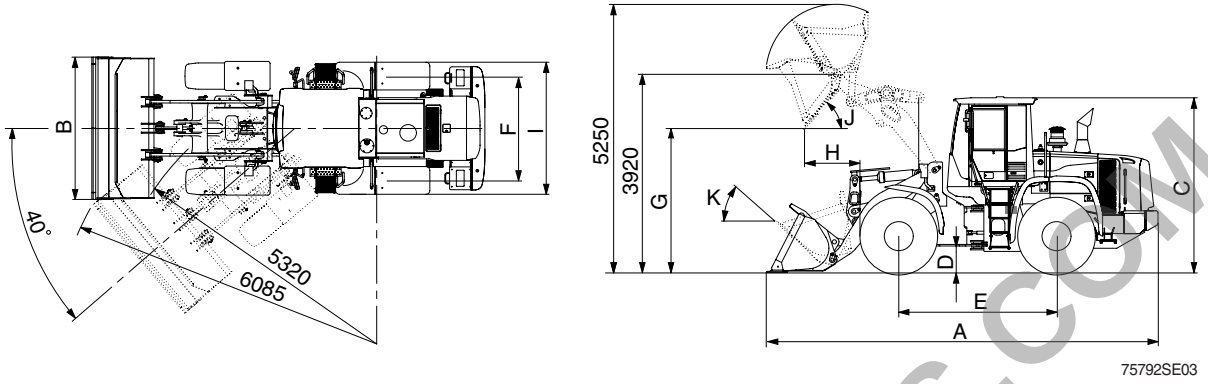
2. SPECIFICATIONS

1) WITH BOLT-ON CUTTING EDGE TYPE BUCKET (HL757-9)



Description			Unit	Specification
Operating weight			kg (lb)	14500 (32000)
Bucket capacity		Struck	m^3 (yd^3)	2.4 (3.1)
		Heaped		2.8 (3.7)
Overall length		A	mm (ft-in)	7580 (24' 10")
Overall width		B		2740 (9' 0")
Overall height		C		3310 (10' 10")
Ground clearance		D		410 (1' 4")
Wheelbase		E		3050 (10' 0")
Tread		F		2050(6' 9")
Dump clearance at 45˚		G		2840 (9' 4")
Dump reach (full lift)		H		1070 (3' 6")
Width over tires		I		2580 (8' 6")
Dump angle		J	degree (˚)	47
Roll back angle (carry position)		K		48
Cycle time		Lift (with load)	sec	5.9
		Dump (with load)		1.1
		Lower (empty)		3.8
Maximum travel speed			km/hr (mph)	37.7 (23.4)
Braking distance			m (ft-in)	12 (39' 4")
Minimum turning radius (center of outside tire)				5.32 (17' 5")
Gradeability			degree (˚)	30
Travel speed	Forward	First gear	km/hr (mph)	6.9 (4.3)
		Second gear		11.4 (7.1)
		Third gear		23.0 (14.3)
		Fourth gear		37.7 (23.4)
	Reverse	First gear		7.3 (4.5)
		Second gear		12.1 (7.5)
		Third gear		24.2 (15)

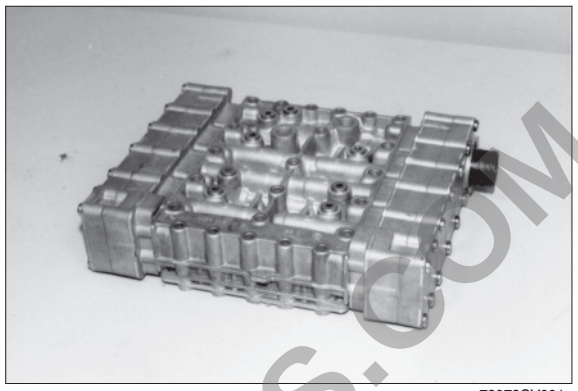
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1. CONTROL VALVE

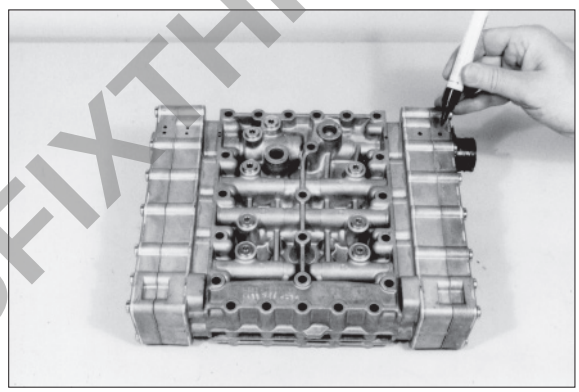
1) DISASSEMBLY

(1) Illustration on the right shows the complete control unit.



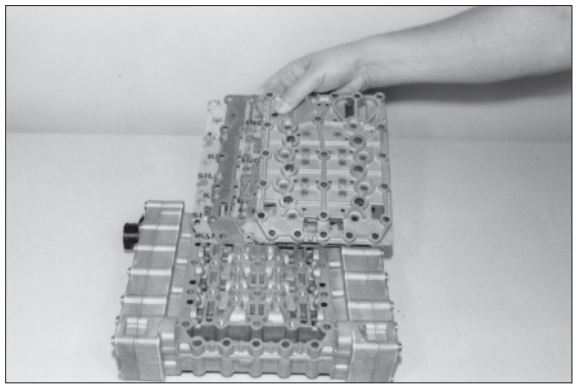
73073CV001

(2) Mark the installation position of the different covers, the housing and cable harness with the valve housing.



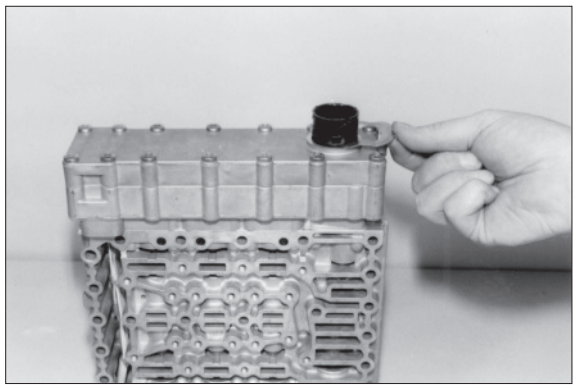
73073CV002

(3) Loosen socket head screws.
Separate duct plate, 1st gasket, intermediate plate and 2nd gasket from the valve housing.
Box spanner 5873 042 002



73073CV003

(4) Remove retaining clip.



73073CV004

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5. TIGHTENING TORQUE OF MAJOR COMPONENT

No.	Descriptions		Bolt size	Torque	
				kgf · m	lbf · ft
1	Engine	Engine mounting bolt, nut (rubber, 2EA)	M20×2.5	57.9 ± 8.7	419 ± 63
2		Engine mounting bolt (bracket, 8EA)	M12×1.75	10.7 ± 1.6	77.4 ± 11.6
3		Engine mounting bolt (fly wheel housing,12EA)	M10×1.5	4.6 ± 0.9	33.3 ± 6.5
4		Radiator mounting bolt	M16×2.0	29.7 ± 4.5	215 ± 32.5
5		Fuel tank mounting bolt, nut	M16×2.0	29.7 ± 4.5	215 ± 32.5
6	Hydraulic system	Main pump housing mounting bolt	M16×2.0	29.7 ± 4.5	215 ± 32.5
7		Brake pump housing mounting bolt	M10×1.5	6.9 ± 1.4	50 ± 10.1
8		Main control valve mounting bolt	M10×1.5	6.9 ± 1.4	50 ± 10.1
9		Steering unit mounting bolt	M10×1.5	6.9 ± 1.4	50 ± 10.1
10		Stop valve	M10×1.5	6.9 ± 1.4	50 ± 10.1
11		Steering valve (EHPS) mounting bolt	M8×1.25	2.5 ± 0.5	18.1 ± 3.6
12		Cushion valve	M8×1.25	2.5 ± 0.5	18.1 ± 3.6
13		Brake valve mounting bolt	M8×1.25	2.5 ± 0.5	18.1 ± 3.6
14		Cut-off valve mounting bolt	M12×1.75	12.8 ± 3.0	92.6 ± 21.7
15		Remote control lever mounting bolt	M6×1.0	1.1 ± 0.2	8.0 ± 1.4
16		Safety valve	M10×1.5	6.9 ± 1.4	50 ± 10.1
17		Hydraulic oil tank mounting bolt	M16×2.0	29.7 ± 4.5	215 ± 32.5
18	Power train system	Transmission mounting bolt, nut (rubber, 2EA)	M24×3.0	100 ± 15	723 ± 108
19		Transmission mounting bolt (bracket)	M20×2.5	46.3 ± 7.0	335 ± 50.6
20		Front axle mounting bolt, nut	M27×2.0	135 ± 15	976 ± 108
21		Rear axle support mounting bolt, nut	M27×2.0	135 ± 15	976 ± 108
22		Tire mounting nut	M22×1.5	79 ± 2.5	571 ± 18.1
23		Drive shaft joint mounting bolt, nut	1/2-20UNF	6.0 ± 0.8	43.4 ± 5.8
24	Others	Counterweight mounting bolt	M30×3.5	199 ± 30	1439 ± 216
25		Operator's seat mounting bolt	M8×1.25	3.4 ± 0.8	24.6 ± 5
26		ROPS Cab mounting bolt (4EA)	M20×2.5	58 ± 8.7	419 ± 63

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4. FAULT CODE

1) MACHINE FAULT CODE

HCESPN	FMI	Description
101	3	Hydraulic oil temperature sensor circuit - Voltage above normal, or shorted to high source (or open circuit)
	4	Hydraulic oil temperature sensor circuit - Voltage below normal, or shorted to low source
145	5	Engine cooling fan EPPR valve circuit - Current below normal, or open circuit
	6	Engine cooling fan EPPR valve bircuit - Current above normal
172	4	Boom up lever detent solenoid circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Boom up lever detent solenoid circuit - Current above normal
173	4	Boom down lever detent solenoid circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Boom down lever detent solenoid circuit - Current above normal
174	4	Bucket lever detent solenoid circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Bucket lever detent solenoid circuit - Current above normal
181	4	Engine cooling fan reverse solenoid circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Engine cooling fan reverse solenoid circuit - Current above normal
183	4	Engine cooling fan reverse driving status signal circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Engine cooling fan reverse driving status signal circuit - Current above normal
187	4	Emergency steering pump relay circuit - Voltage below normal, or shorted to low source (or open circuit)
	6	Emergency steering pump relay circuit – Current above normal
202	0	Steering main pump pressure sensor data above normal range (or open circuit)
	1	Steering main pump pressure sensor data below normal range
	2	Steering main pump pressure sensor data error
	4	Steering main pump pressure sensor circuit - Voltage below normal, or shorted to low source
203	0	Emergency steering pump pressure sensor data above normal range (or open circuit)
	1	Emergency steering pump pressure sensor data below normal range
	2	Emergency steering pump pressure sensor data error
	4	Emergency steering pump pressure sensor circuit - Voltage below normal, or shorted to low source
204	0	Boom cylinder pressure sensor data above normal range (or open circuit)
	1	Boom cylinder pressure sensor data below normal range
	2	Boom cylinder pressure sensor data error
	4	Boom cylinder pressure sensor circuit - Voltage below normal, or shorted to low source
205	0	Bucket cylinder pressure sensor data above normal range (or open circuit)
	1	Bucket cylinder pressure sensor data below normal tange
	2	Bucket cylinder pressure sensor data error
	4	Bucket cylinder pressure sensor circuit - Voltage below normal, or shorted to low source

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2. TROUBLESHOOTING

1) TRANSMISSION

※ **Diagnose malfunction charts are arranged from most probable and simplest to verify, to least likely, more difficult to verify. Remember the following steps when troubleshooting a problem :**

Step 1. Operational check out procedure (See group 3 in section 1.)
Step 2. Operational checks (In this group.)
Step 3. Troubleshooting
Step 4. Tests and/or adjustments (See group 3.)

Problem	Cause	Remedy
Transmission slippage	Low oil level.	Add oil.
	Wrong oil grade.	Change oil.
	Restricted transmission pump suction screen.	Remove and clean screen.
	Leak in transmission control valve or gasket.	Remove valve and inspect gaskets.
	Low transmission pump flow due to worn pump.	Do transmission pump flow test.
	Weak or broken pressure regulating valve spring.	Do transmission system pressure test.
Error code on display	Something wrong in transmission.	Go to transmission error code group at page 3-32~3-51.

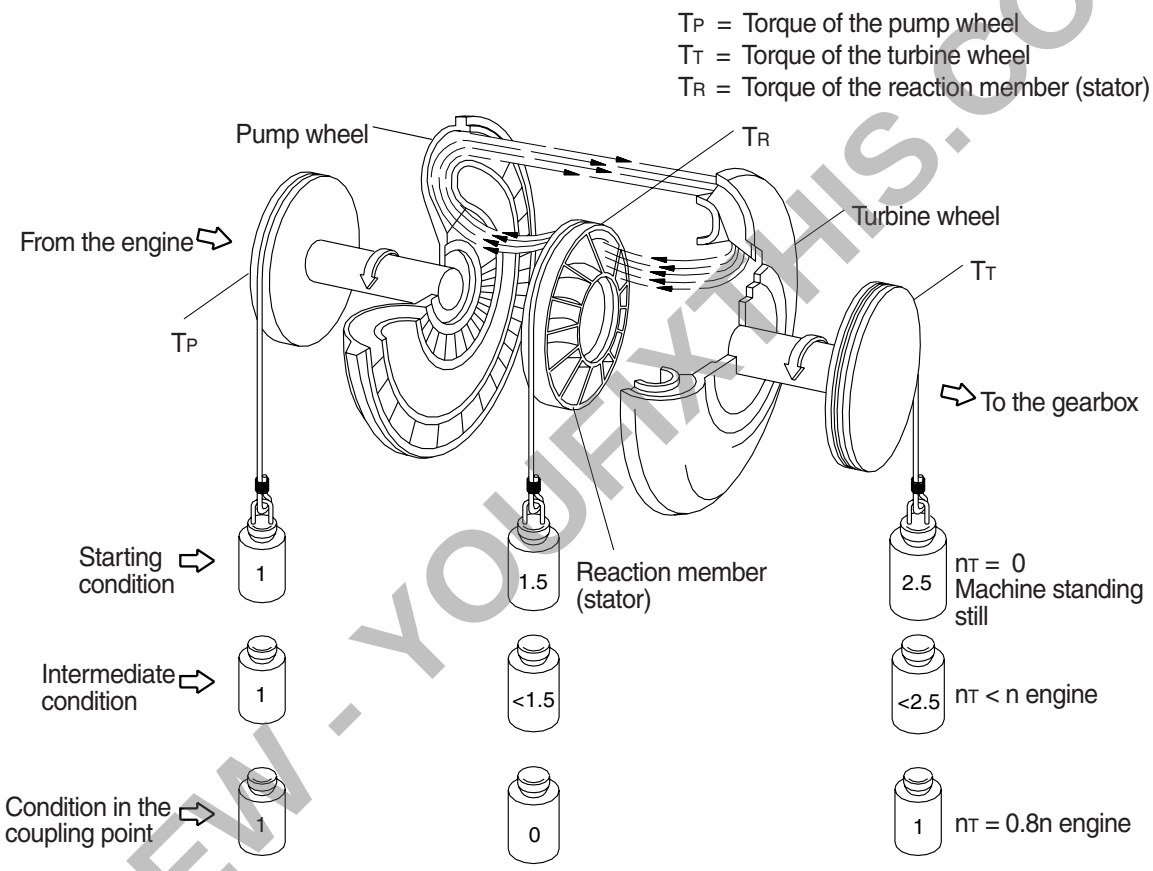
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when the turbine speed is reaching about 80% of the pump speed, the torque multiplication becomes 1.0 i.e. the turbine torque becomes equal to that of the pump torque.
From this point on, the converter is working similar to a fluid clutch.

A stator freewheel serves to improve the efficiency in the upper driving range, in the torque multiplication range it is backing-up the torque upon the housing, and is released in the clutch range.
In this way, the stator can rotate freely.

Function of a hydrodynamic torque converter (schematic view)

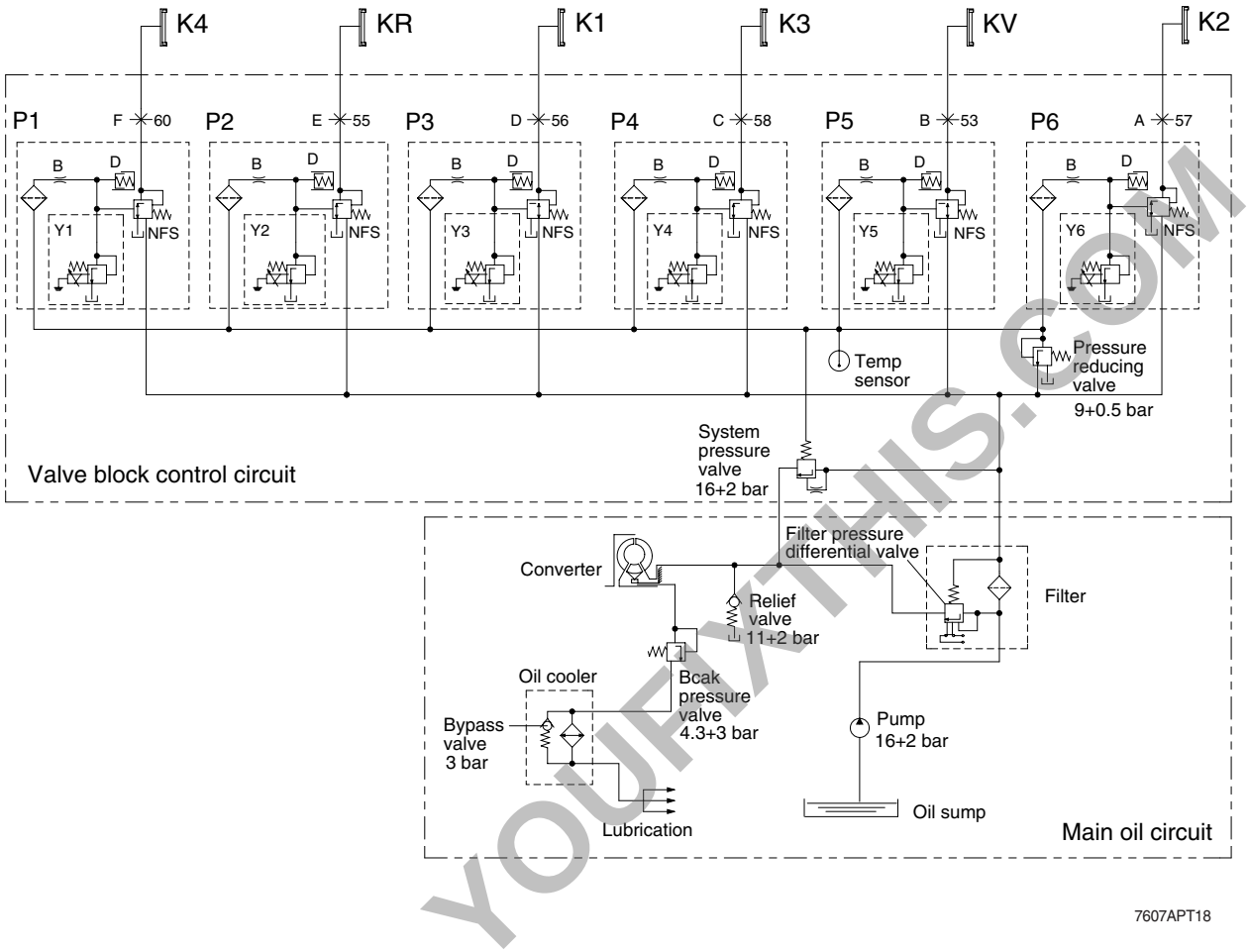


7577APT100

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HYDRAULIC CIRCUIT



7607APT18

NFS	Follow-on slide	P3	Proportional valve clutch K1
D	Vibration damper	P4	Proportional valve clutch K3
B	Orifice	P5	Proportional valve clutch KV
P1	Proportional valve clutch K4	P6	Proportional valve clutch K2
P2	Proportional valve clutch KR	Y1~Y6	Pressure regulator

Speed	Forward				Reverse			Neutral	Engaged clutch	Positions on the valve block	Current No. of the measuring points
	1	2	3	4	1	2	3				
Y1				X					K4	F	60
Y2					X	X	X		KR	E	55
Y3	X				X				K1	D	56
Y4			X	X			X		K3	C	58
Y5	X	X	X						KV	B	53
Y6		X				X			K2	A	57
Engaged clutch	K1,KV	KV,K2	K3,KV	K4,K3	KR,K1	KR,K2	KR, K3		-	-	-

X : Pressure regulator under voltage

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Millimeters to inches

1mm = 0.03937in

	0	1	2	3	4	5	6	7	8	9
0		0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354
10	0.394	0.433	0.472	0.512	0.551	0.591	0.630	0.669	0.709	0.748
20	0.787	0.827	0.866	0.906	0.945	0.984	1.024	1.063	1.102	1.142
30	1.181	1.220	1.260	1.299	1.339	1.378	1.417	1.457	1.496	1.536
40	1.575	1.614	1.654	1.693	1.732	1.772	1.811	1.850	1.890	1.929
50	1.969	2.008	2.047	2.087	2.126	2.165	2.205	2.244	2.283	2.323
60	2.362	2.402	2.441	2.480	2.520	2.559	2.598	2.638	2.677	2.717
70	2.756	2.795	2.835	2.874	2.913	2.953	2.992	3.032	3.071	3.110
80	3.150	3.189	3.228	3.268	3.307	3.346	3.386	3.425	3.465	3.504
90	3.543	3.583	3.622	3.661	3.701	3.740	3.780	3.819	3.858	3.898

Kilogram to Pound

1kg = 2.2046lb

	0	1	2	3	4	5	6	7	8	9
0		2.20	4.41	6.61	8.82	11.02	13.23	15.43	17.64	19.84
10	22.05	24.25	26.46	28.66	30.86	33.07	35.27	37.48	39.68	41.89
20	44.09	46.30	48.50	50.71	51.91	55.12	57.32	59.5.	61.73	63.93
30	66.14	68.34	70.55	72.75	74.96	77.16	79.37	81.57	83.78	85.98
40	88.18	90.39	92.59	94.80	97.00	99.21	101.41	103.62	105.82	108.03
50	110.23	112.44	114.64	116.85	119.05	121.25	123.46	125.66	127.87	130.07
60	132.28	134.48	136.69	138.89	141.10	143.30	145.51	147.71	149.91	152.12
70	154.32	156.53	158.73	160.94	163.14	165.35	167.55	169.76	171.96	174.17
80	176.37	178.57	180.78	182.98	185.19	187.39	189.60	191.80	194.01	196.21
90	198.42	200.62	202.83	205.03	207.24	209.44	211.64	213.85	216.05	218.26

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7. RECOMMENDED LUBRICANTS

Use only oils listed below or equivalent.
Do not mix different brand oil.

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature °C (°F) -20 (-4) / -10 (14) / 0 (32) / 10 (50) / 20 (68) / 30 (86) / 40 (104)
Engine oil pan	Engine oil	18 (4.8)	SAE 30 SAE 10W SAE 10W-30 SAE 15W-40
Transmission	Engine oil	28 (7.4)	SAE 10W-30 SAE 15W-40
Axle	UTTO	Front : 29 (7.7) Rear : 24 (6.3)	★Refer to below list
Hydraulic tank	Hydraulic oil	Tank: 155 (40.9) System: 215 (56.8)	ISO VG 32 ISO VG 46 ISO VG 68
Fuel tank	Diesel fuel	294 (77.6)	ASTM D975 NO.1 ASTM D975 NO.2
Fitting (grease nipple)	Grease	As required	NLGI NO.1 NLGI NO.2
Radiator	Mixture of antifreeze and water 50 : 50	35 (9.2)	Ethylene glycol base permanent type

· SAE : Society of Automotive Engineers
· API : American Petroleum Institute
· ISO : International Organization for Standardization
· NLGI : National Lubricating Grease Institute
· ASTM : American Society of Testing and Material
· UTTO : Universal Tractor Transmission Oil

★ Recommended oil list
- BP TERRAC SUPER TRANSMISSION 10W-30
- CASTROL AGRI TRANS PLUS 10W-30
- MOBILFLUID 426
- SHELL DONAX TD 10W-30
- TOTAL DYNATRANS MPV

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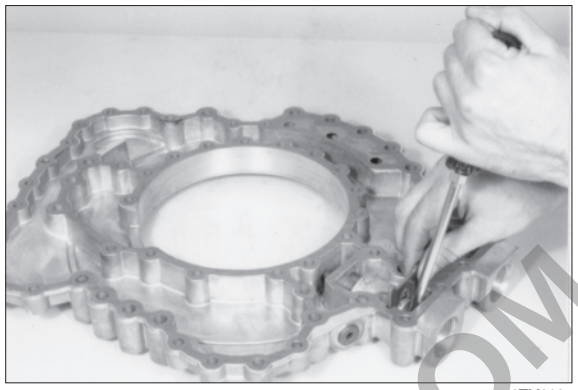
Fault code (Hex)	Meaning of the fault code possible reason for fault detection	Reaction of the TCU	Possible steps to repair
E1	S.C. battery voltage at speedometer output	-	※ Not used
E2	S.C. to ground or O.C at speedometer output	-	※ Not used
E3	S.C. to battery voltage at display output TCU sends data to the display and measures always a high voltage level on the connector · Cable or connectors are defective and are contacted to battery voltage · Display has an internal defect	No reaction OP mode : Normal	· Check the cable from TCU to the display · Check the connectors at the display · Change display
E4	S.C. to ground at display output TCU sends data to the display and measures always a high voltage level on the connector · Cable or connectors are defective and are contacted to battery voltage · Display has an internal defect	No reaction OP mode : Normal	· Check the cable from TCU to the display · Check the connectors at the display · Change display
E5	Communication failure on DeviceNet	Shift to neutral OP mode : TCU shutdown	· Check Omron master · Check wire of DeviceNet-Bus · Check cable to Omron master
E6	DISPID1 timeout Timeout of CAN-massage DISPID1 from display controller · Interference on CAN-Bus · CAN wire/connector is defective · Can wire/connector is defective and has contact to vehicle ground or battery voltage	TCU select parameter set with ID0 OP mode : Limp home	· Check display controller · Check wire of CAN-Bus · Check cable display controller

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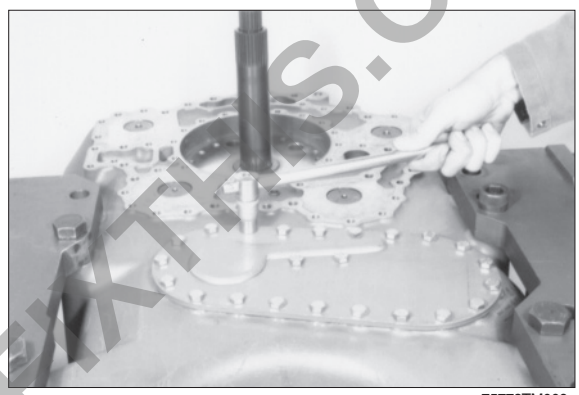
(4) Converter back pressure valve

① Preload compression spring and remove lock plate.
Remove released components.



75773TM068

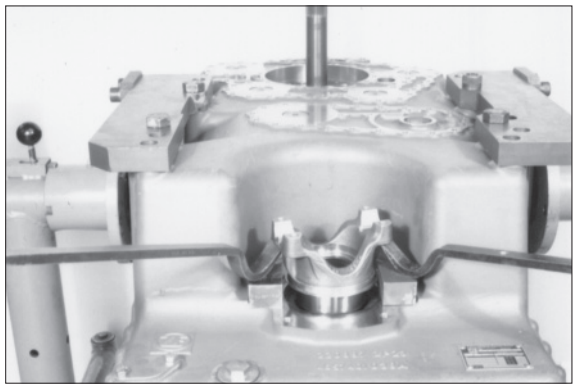
② Loosen hexagon head screws.
Remove cover and gasket.



75773TM069

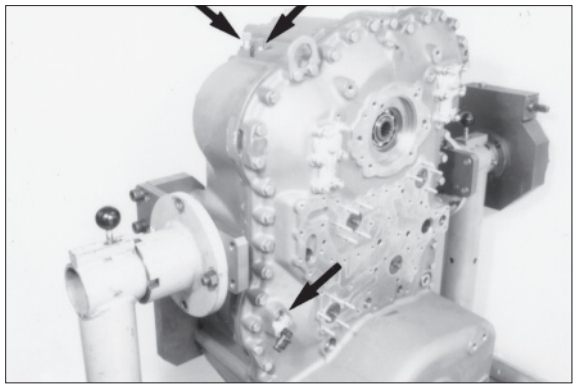
(5) Remove output, input and clutches

① Remove lock plate, loosen hexagon head screws and pry converter side output flange off the shaft.
Now, pry shaft seal out of the housing bore.
Tilt transmission 180˚ and remove rear side output flange accordingly.
Pry bar 5870 345 065



75773TM075

② Remove speed sensor as well as both inductive transmitters (arrows).

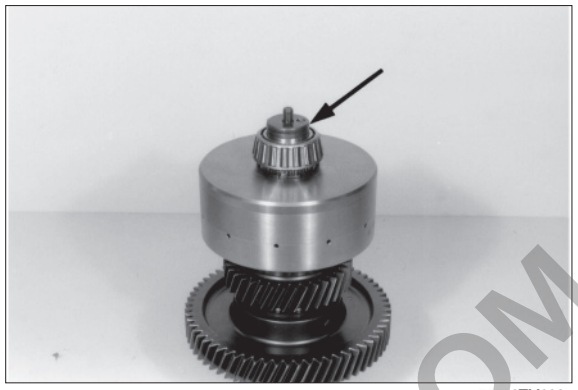


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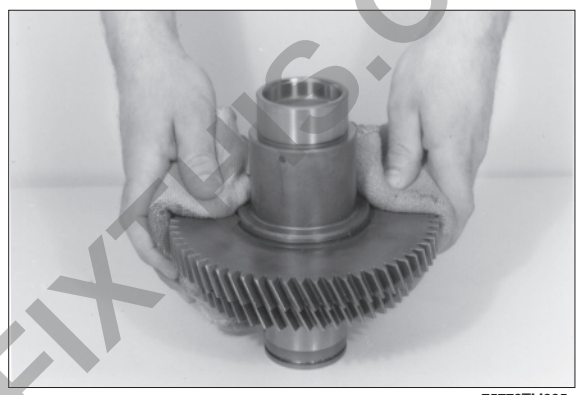
Squeeze rectangular ring in (arrow) and let it snap in.
Install opposite rectangular ring.



75773TM223

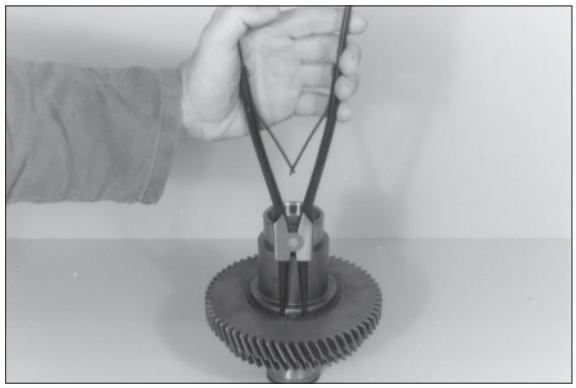
(5) Preassemble drive shaft

① Undercool the drive shaft (about -80˚C), heat the gear (about +120˚C) and assemble it until contact is obtained.



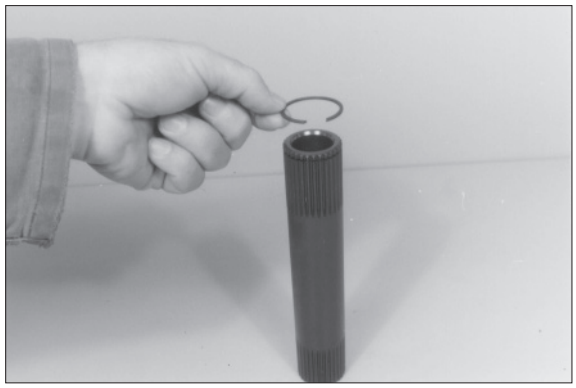
75773TM225

② Fix gear axially by means of circlip.



75773TM226

③ Squeeze snap ring into groove of the turbine shaft.



75773TM227

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(14) Install cup springs (7 pieces each/pin).

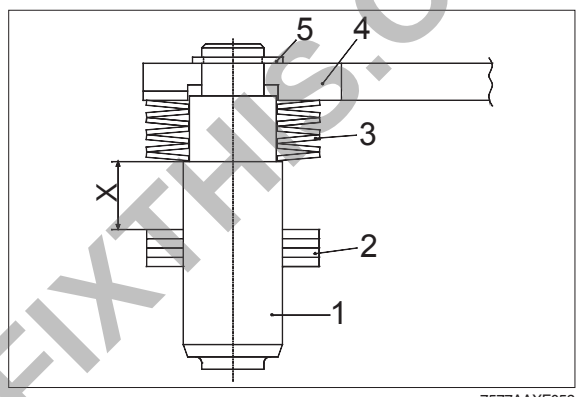
※ Pay attention to the installation position of the cup springs, see below sketch.



7577AAXF052

To the sketch :

1 Pin
2 Gripping rings
3 Cup springs
4 Support shim
5 Circlip
X Installation dimension gripping rings
$10.5^{+0,3}$ mm

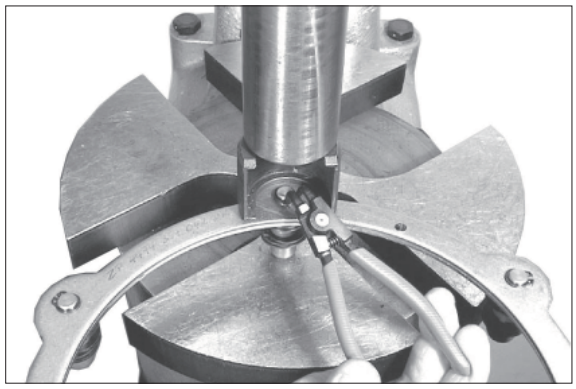


7577AAXF053

(15) Insert preassembled pins into the support shim and fix it by means of the circlip.

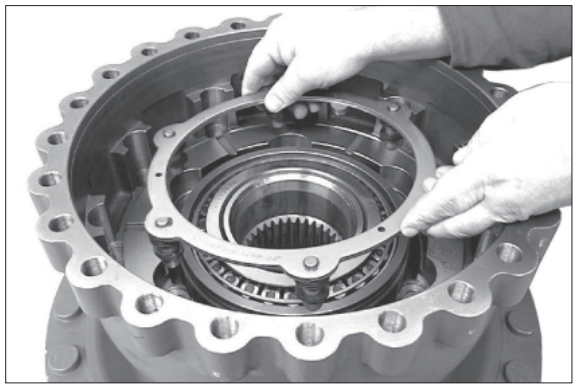
※ Special tool
Assembly pliers 5870 900 051

※ Pay attention to clearance of the cup springs.



7577AAXF054

(16) Insert preassembled support shim into the piston.

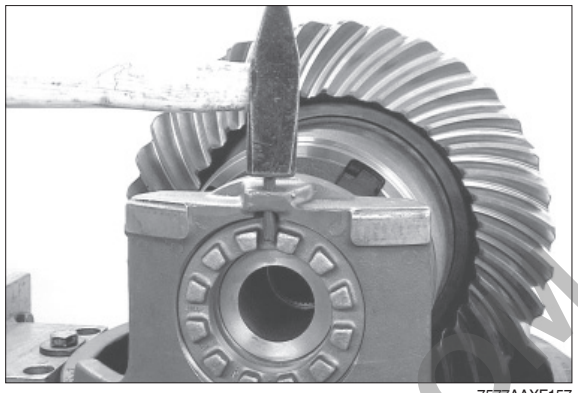


7577AAXF055

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㊶ Secure both adjusting nuts by means of slotted pins.



7577AAXF157

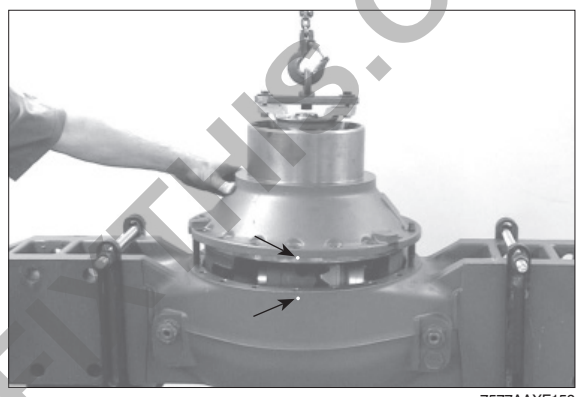
㊷ Install two adjusting screws and insert differential carrier into the axle casing until contact by means of lifting tackle.

※ Special tool

Adjusting screws	5870 204 022
Lifting tackle	5870 281 044

※ Observe radial location (see marking Page 3-155 / figure 7577AAXF081).

⚠ **Apply sealing compound (three bond type 1215) on mounting face.**

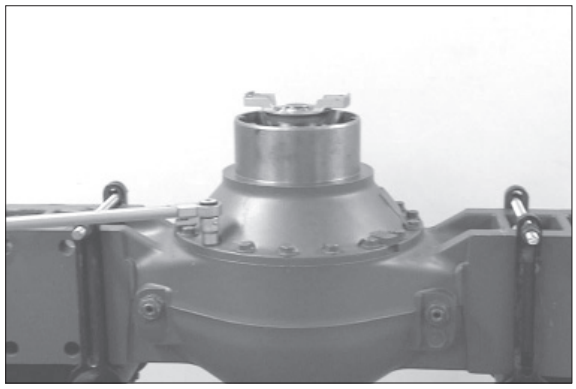


7577AAXF158

㊸ Fasten differential carrier by means of new locking screws.

· Tightening torque : 25.5 kgf · m
(184 lbf · ft)

⚠ **Only use of the new locking screws is permissible.**

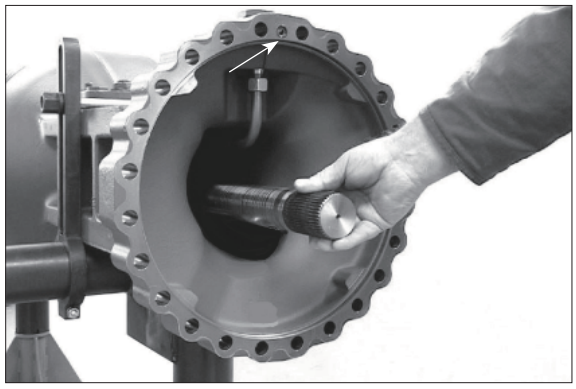


7577AAXF159

㊹ Insert stub shaft into spline of the axle bevel gear until contact.

Then fix O-ring (see arrow) by means of grease into the recess of the axle casing.

※ Step (figure 7577AAXF160 ~ 163) is to be made on both output sides.



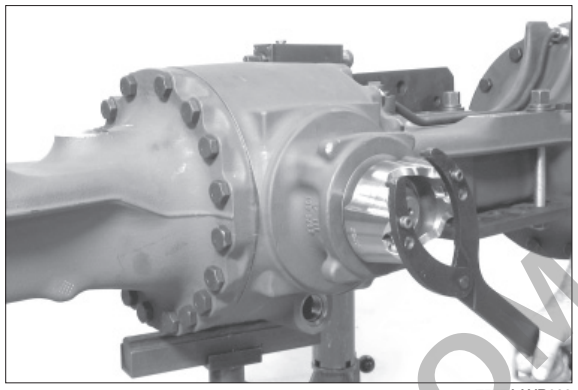
7577AAXF160

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⑱ Roll input pinion over crown wheel in both directions (coast - drive flank meshing - contact pattern).

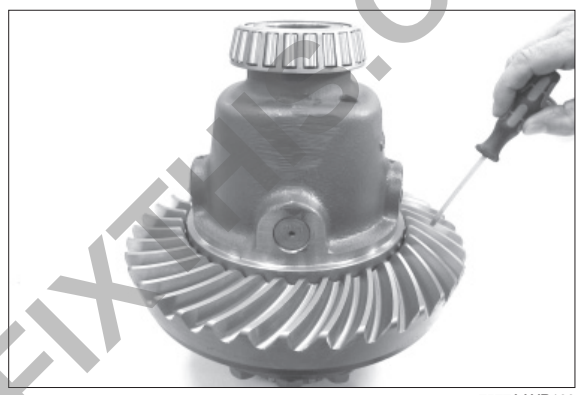
※ Special tool
Clamping fork 5870 240 025


7577AAXR099

⑲ Disassemble differential.

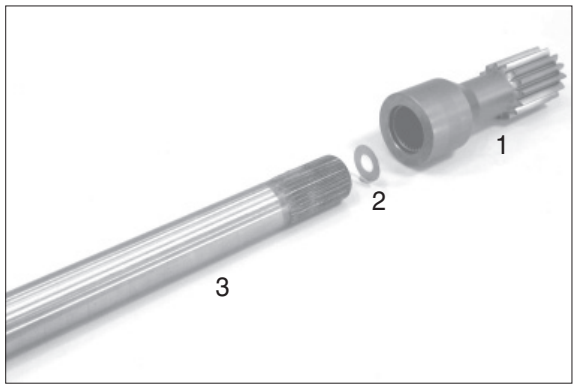
Compare contact pattern to examples – page 3-211.

※ If contact pattern differs considerably, use a suitable shim for correction (see figure 7577AAXR085, page 3-204).


7577AAXR100

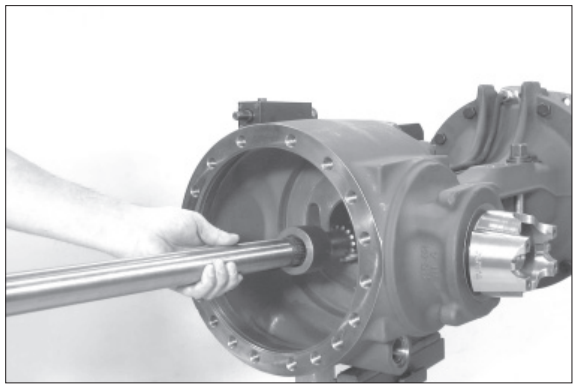
⑳ If disassembled :
Insert shim(s) (2) into sun gear shaft (1) and mount stub shaft (3).

※ If position was not allocated, as specified in disassembly instructions on page 3-203, figure 7577AAXR072 and sun gear shaft clearance (see page 3-194, figure 7577AAXR58~62) must be set on both output sides.



7577AAXR101

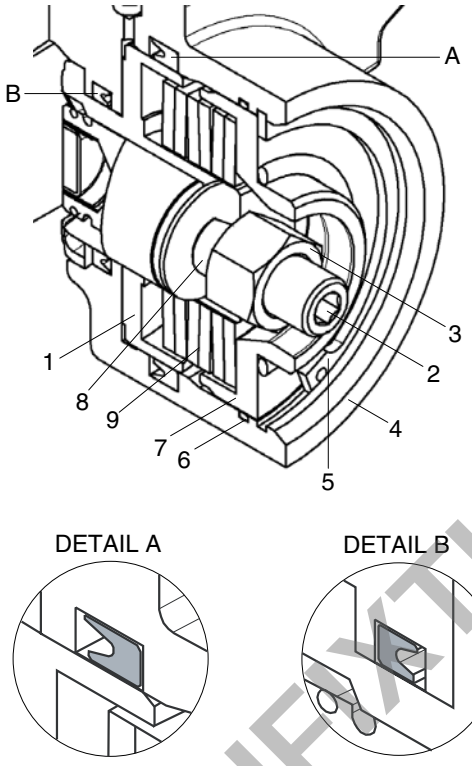
㉑ Insert preassembled stub shafts into both outputs (considering allocation to the correct output side).


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(2) Changing the seal



100D7BS115

1	Piston	5	Circlip	9	Bank of cup spring
2	Adjusting screw	6	Seal	A	Detail of the seal
3	Lock nut	7	Guide bolt	B	Detail of the seal
4	Housing	8	Thrust bolt		

※ Faulty seals must be exchanged in accordance with the instructions below.

① Stand the vehicle on an even surface and secure against rolling away.
② Release the parking brake by applying the necessary release pressure.
③ Release the screw cap and unscrew.
④ Release the lock nut (size 24 or 30) and turn the adjusting screw with socket wrench size 8 or 10 manually counter clockwise until the adjuster screw is flush with the inner side of the piston.
⑤ Push back the thrust bolt until it has contact with the piston. Following actuate the hand brake valve (no pressure must be in the piston chamber). The bank of cup springs is now completely depressurized.
⑥ Unscrew the pressure hose and remove the brake.
⑦ Release the circlip and remove the pressure ring of the housing.
⑧ Release the bank of cup spings and the piston.

⚠ Pay attention to the mounting direction of the seal rings, otherwise leaks can occur.

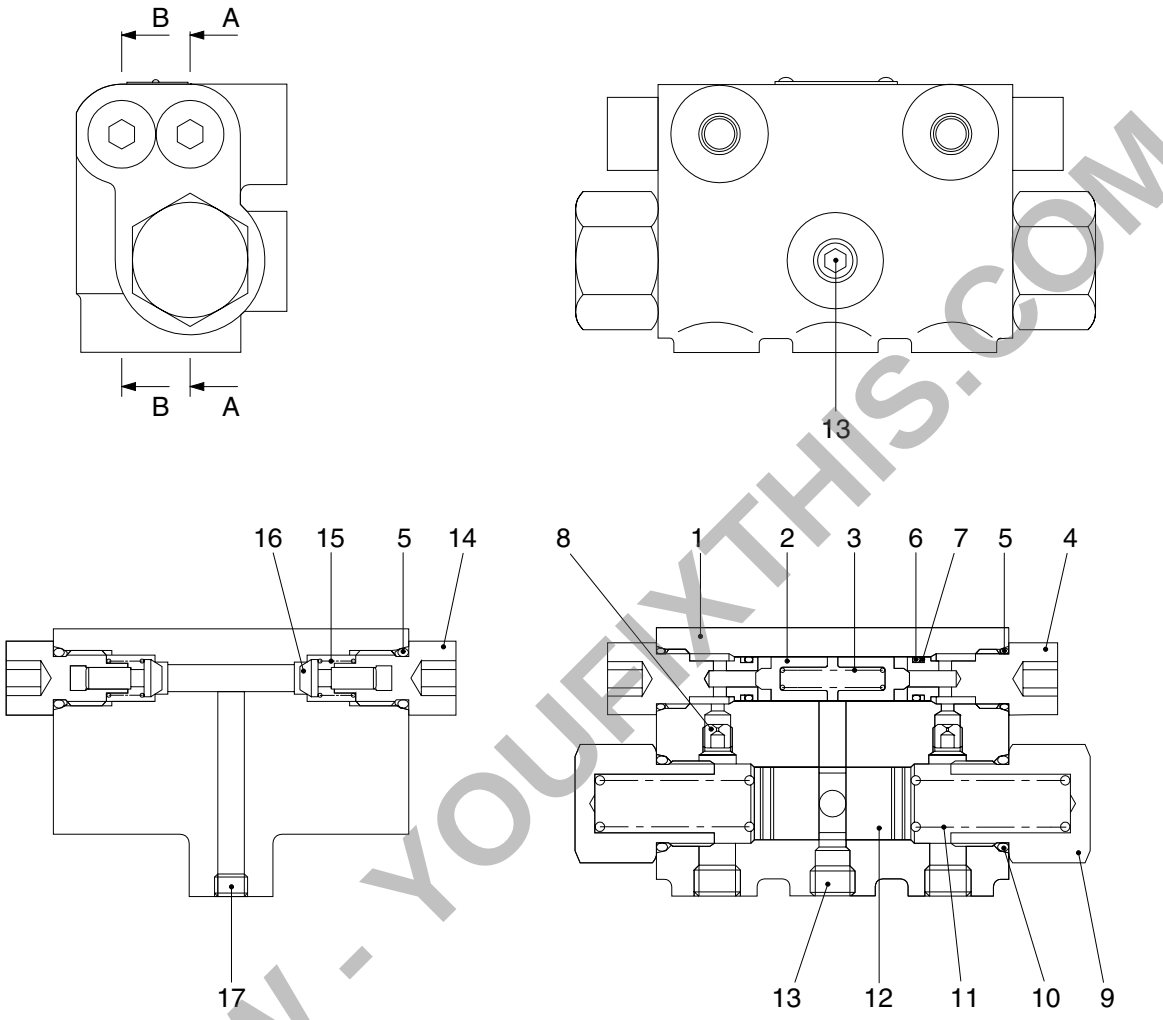
⚠ Use for mounting the new seal rings a suitable mounting needle with rounded edge. Be careful.

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5. CUSHION VALVE

1) STRUCTURE

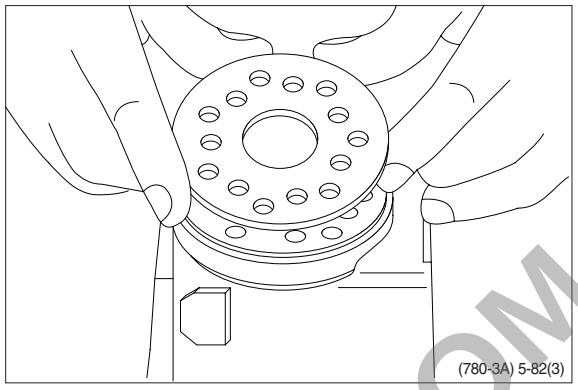


1	Housing	7	Back ring	13	Plug
2	Poppet	8	Orifice	14	Plug
3	Spring	9	Plug	15	Spring
4	Valve seat	10	O-ring	16	Poppet
5	O-ring	11	Spring	17	Plug
6	O-ring	12	Spool		

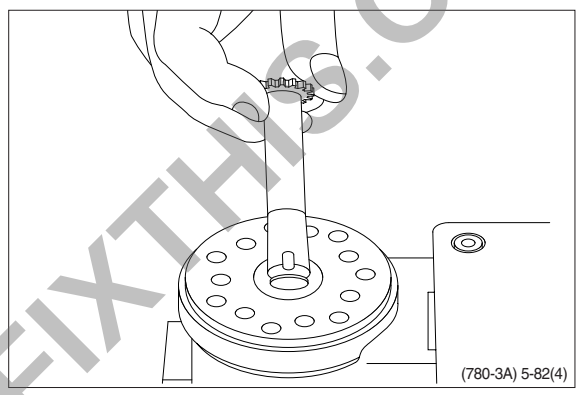
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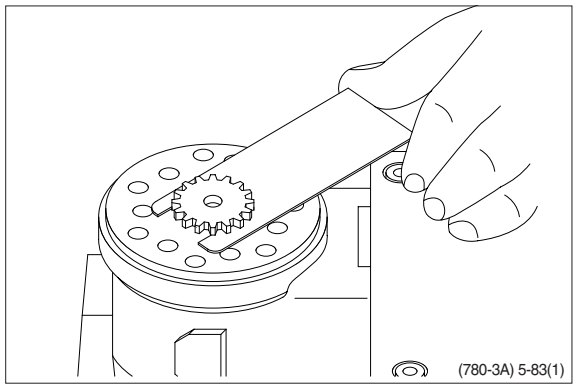
(22) Place the distributor plate so that the channel holes match the holes in the housing.



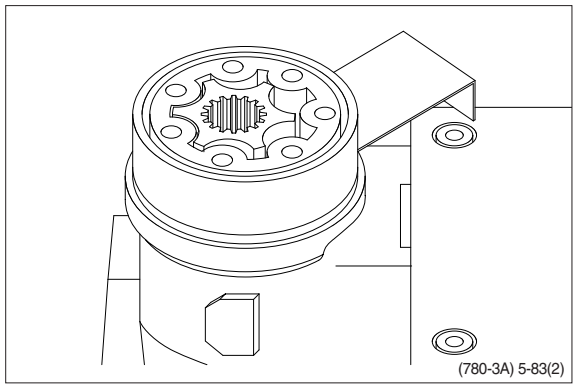
(23) Guide the cardan shaft down into the bore so that the slot is parallel with the connection flange.



(24) Place the cardan shaft as shown - so that it is held in position by the mounting fork.



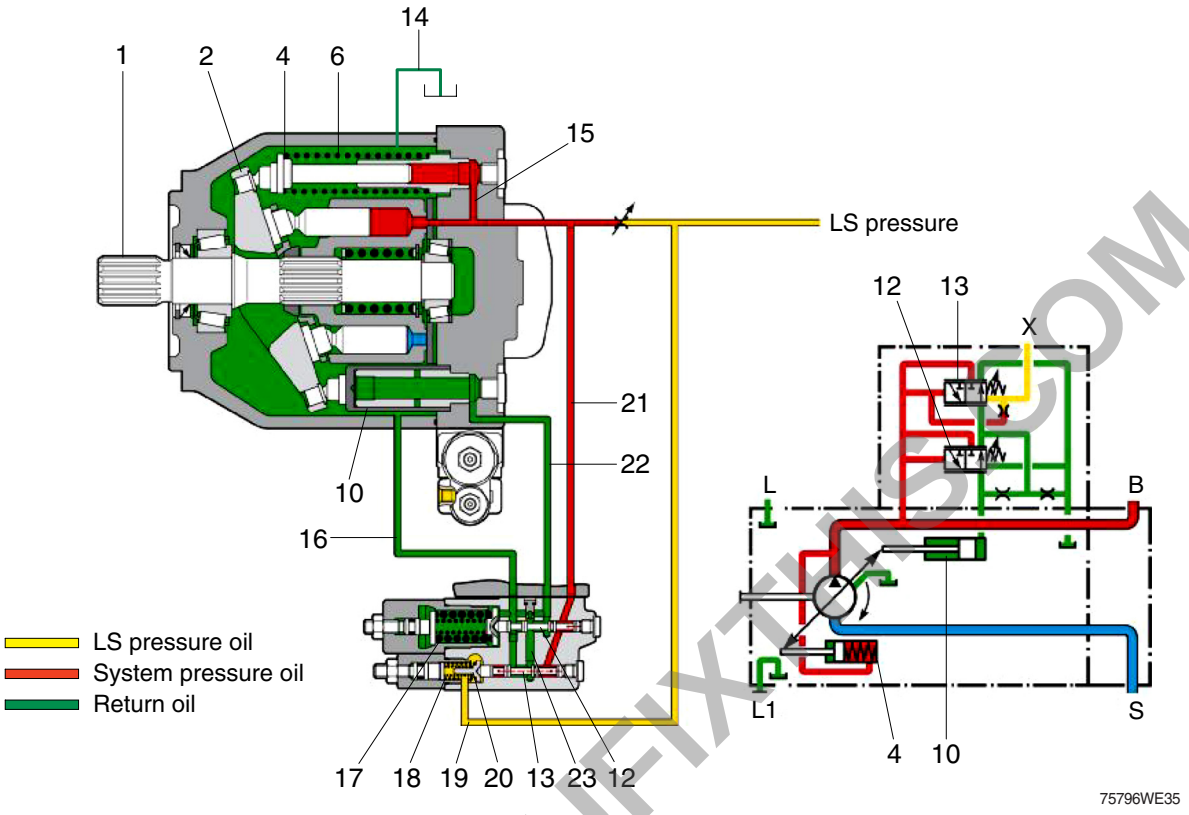
(25) Grease the two O-rings with mineral oil approx. viscosity 500 cSt at 20˚C and place them in the two grooves in the gear rim. Fit the gearwheel and rim on the cardan shaft.



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(1) Upstroking



1	Drive shaft	13	Flow compensator spool	19	LS line from the metering pump
2	Swash plate	14	Case drain	20	Cavity
4	Counter piston	15	Passage	21	Passage
6	Counter spring	16	Passage	22	Passage
10	Control piston	17	Spring	23	Cavity
12	Pressure compensator spool	18	Spring		

Upstroking of the pump occurs as flow demand from loader and steering system.
The increased flow demand causes a LS pressure in LS line (19). The LS pressure in LS line (19) combines with the force of spring (18) in cavity (20).
The force of spring (18) causes pump pressure to be higher than the LS pressure (19).
If the combination of LS pressure and of spring force is greater than the pump discharge pressure, this difference pressure causes spool (13) to move right. As spool (13) moves right, the spool (13) blocks the flow of supply oil to control piston (10). Pump swash plate (2) is controlled by pressure and flow as much as hydraulic system requests.

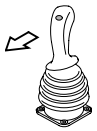
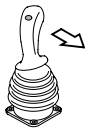
When the oil flow to control piston (10) is blocked, the pilot oil in passage (22) drains to passage (23). The oil then flows past pressure compensator spool (12) and through passage (16) into the housing and via the drain line (14) to tank.

Supply oil flows through passage (15) to counter piston (4). The oil acts against counter piston (4). The oil combines with the force of counter spring (6). This causes swash plate (2) to upstroke.

This also causes the pump flow to increase. As flow requirements are satisfied, the pump output pressure increase. The pressure increases until the pressure in passage (15) moves flow compensator spool (13) up to be satisfied with system requirement for pressure and flow.

- Pump discharge pressure = force of spring (18) + LS pressure (19)

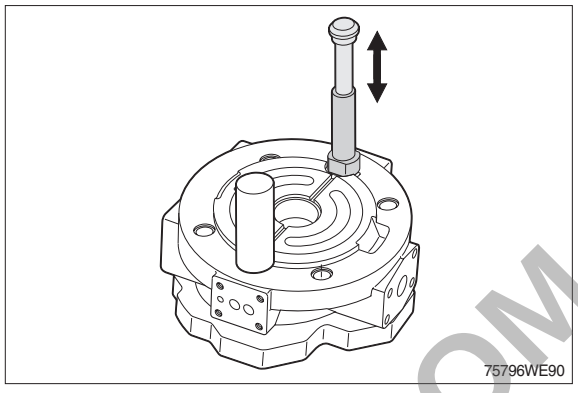
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Item	Description		Service action
Bucket leveler (positioner) check Run engine at low idle.		Position bucket fully dumped just above ground level. Move control lever to bucket leveler detent position and release. **LOOK** : Bucket must rollback to the level position and control lever must return to neutral. If bucket is in a rolled back position when key is turned ON, control lever must be returned to neutral manually if placed in the bucket leveler detent position. After bucket is dumped once, bucket leveler will work normally.	**OK** Check complete. **NOT OK** Do bucket leveler checks.
Boom height kickout check Run engine at low idle.		Position bucket flat on ground. Move control lever to boom raise detent position and release. **LOOK** : Boom must raise to the set height and stop. Control lever must return to neutral.	**OK** Check complete. **NOT OK** Do boom height kickout check.
Cycle time check Heat hydraulic oil to operating temperature. Run engine at high idle.	Function Boom raise Boom lower Bucket dump Bucket rollback Steering [No. of turns]	Operating condition. Bucket flat on ground to full height. Full height to level ground. Boom at full height. Boom at full height. Frame stop to frame stop.	Maximum cycle time 5.6sec 3.3sec 1.1sec (★2.0sec) 1.7sec (★2.4sec) 2.5sec [3.5 turns] ★ : HL757TM-9 **OK** Check complete. **NOT OK** Go to slow hydraulic functions in group 2.

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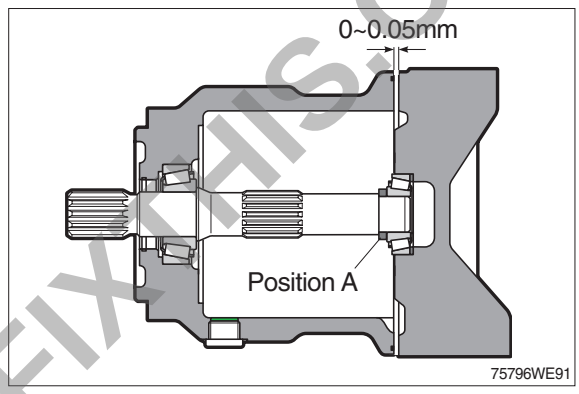
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(12) Check :
Check running conditions of the opposite piston.



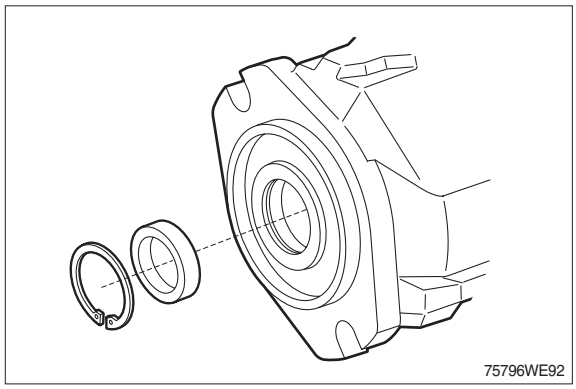
7) ADJUSTMENT OF TAPER ROLLER BEARING SET

(1) Cast iron housing must have initial tension of the bearings: 0~0,05 mm, grind position A if necessary.

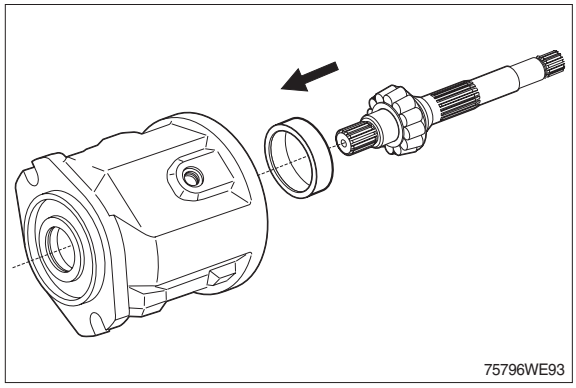


8) PUMP ASSEMBLY

(1) Fit the seal into the housing.
Fit the circlip.



(2) Fit the drive with bearing from rear end.
※ Do not touch seal lip with edge of keyway or spline.



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7. WIPER AND WASHER CIRCUIT

1) OPERATING FLOW

Fuse box[CN-36 (14)] → Wiper relay Hi [CR-4 (3)→(4)] → I/conn [CN-4 (4)] → Front wiper motor [CN-21 (1)]
Wiper relay Hi [CR-4 (3)→(4)] → Wiper relay Lo [CR-26 (5), (2)]
→ I/conn [CN-4 (45)] → Multi function switch [CS-12 (6)]
→ I/conn [CN-9 (3)] → Rear wiper & washer switch [CS-35 (3)]
→ Rear wiper motor [CN-102 (1)]

(1) Front washer switch ON

① Washer switch ON [CS-12(6)→(2)] → I/conn [CN-4 (41)] → Front washer [CN-22 (1)]
→ Washer operating
→ MCU [CN-58A (A31)→(B02)] → Front wiper relay Lo [CR-26 (5)→(3)] → I/conn [CN-4 (1)] → Front wiper motor [CN-21 (5)] → Wiper motor operating (low)

(2) Front wiper switch ON

① INT position
Wiper switch ON [CS-12 (6)→(1)] → I/conn [CN-4 (40)] → MCU [CN-58A (A31)→(B02)] → Wiper relay Lo [CR-26 (5)→(3)] → I/conn [CN-4 (1)] → Front wiper motor [CN-21(5)] → Front wiper motor intermittently operating

② Lo position
Wiper switch ON [CS-12 (6)→(4)] → I/conn [CN-4 (43)] → Wiper relay Lo [CR-26 (4)→(3)] → I/conn [CN-4 (1)] → Front wiper motor [CN-21 (5)] → Front wiper motor operating (low)

③ Hi position
Wiper switch ON [CS-12 (6)→(3)] → I/conn [CN-4 (42)] → Wiper relay Hi [CR-4(3)→(5)] → I/conn [CN-4 (2)] → Front wiper motor [CN-21(4)] → Front wiper motor operating (high)

(3) Auto-parking (when switch OFF)

Switch OFF → Fuse box [CN-36 (14)] → Wiper relay Hi [CR-4 (3)→(4)] → I/conn [CN-4 (4)] → Front wiper motor [CN-21 (1)→(2)] → Multi function switch [CS-12 (5)→(4)] → I/conn [CN-4 (43)] → Wiper relay Lo [CR-26 (4)→(3)] → I/conn [CN-4 (1)] → Front wiper motor [CN-21 (5)] → Wiper motor stop

(4) Rear wiper and washer switch

① Wiper switch ON (1st step)
Wiper switch ON [CS-35 (3)→(8)] → I/conn [CN-9 (5)] → Rear wiper motor [CN-102(5)] → Rear wiper motor operating

② Washer switch ON (2nd step)
Washer switch ON [CS-35 (3)→(5)] → I/conn [CN-9 (4)] → Rear washer tank [CN-103(1)] → Washer operating

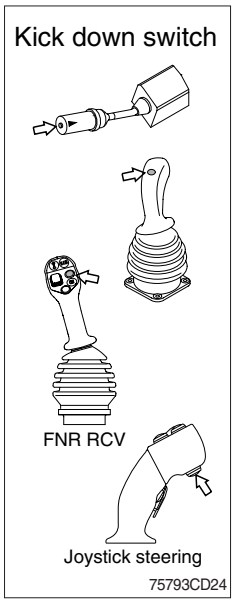
2) CHECK POINT

Condition	Check point	
Engine : Stop Key switch : ON Voltage : 20~25V	① - GND (front wiper switch power input)	⑥ - GND (wiper relay power input)
	② - GND (rear wiper switch power input)	⑦ - GND (front washer power output)
	③ - GND (wiper relay power input)	⑧ - GND (rear washer power output)
	④ - GND (front wiper motor Lo power input)	⑨ - GND (front wiper motor power output)
	⑤ - GND (front wiper motor High power input)	⑩ - GND (rear wiper motor power output)

※ GND : Ground

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23) KICK DOWN SWITCH



(1) Manual mode

It is effective 2nd speed to 1st speed only and recover to 2nd speed quickly when push the switch one more time.

(2) Automatic mode

① **Mode 1** (down/up)

It shifts down quickly from current gear to one step lower speed by pushing the switch and recover to current speed quickly when push the switch one more time.

② **Mode 2** (down)

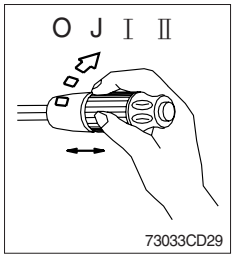
It shifts down from current gear to one step lower speed when push the switch every time.

The kick down function is released in only 1st speed.

※ **Refer to page 7-32 for the kick down setting.**

※ **The normal autoshift function continues after the kick down switch is released.**

24) MULTI FUNCTION SWITCH



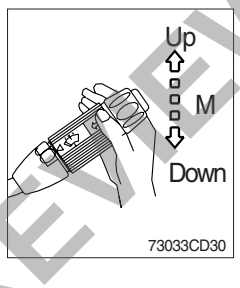
(1) Front wiper and washer switch

① When the switch is in **J** position, the wiper moves intermittently.

② When placed in Ⅰ or Ⅱ position, the wiper moves continuously.

③ If you push the grip of the lever, washer liquid will be sprayed and the wiper will be activated 2-3 times.

※ **Check the quantity of washer liquid in the tank. If the level of the washer liquid is LOW, add the washer liquid (in cold, winter days) or water. The capacity of the tank is 1 liter.**



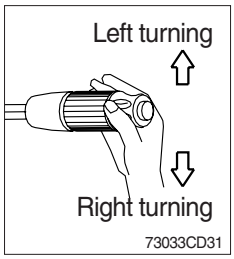
(2) Dimmer switch

① This switch is used to turn the head lights direction.

② Switch positions

- Up : To flash for passing
- Middle : Head lights low beam ON
- Down : Head lights high beam ON

③ If you release the switch when it's in up position, the switch will return to middle.



(3) Turning switch

① This switch is used to warn or signal the turning direction of the machine to other vehicles or equipment.

② Push the lever up for turning left, pull the lever down for turning right.

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