GENERAL SPECIFICATIONS

COMPONENT			SPECIFICATION
Equipment weight			35.3 metric ton (78,000 lbs)
Engine	Model		D1146TI
	Style		Water cooled - 6 cylinders
	Rated output		195 ps @1,900 rpm (189.37 hp @1,900 rpm)
	Maximum torque		80 kg•m @ 1,300 rpm (578.64 ft lbs @ 1,300 rpm)
	Fuel tank capacity		435 liters (114.84 U.S. gal.)
Hydraulic pump	Style		Axial piston
	Discharging pressure		350 kg/sq cm (4,978.17 psi)
	Maximum discharge quantity		2 x 250 liters/minutes (2 x 66 U.S. GPM)
	Hydraulic oil tank capacity		290 liters (76.56 U.S. gal.)
Performance	Swing speed		12.1 RPM
	Travel speed	High speed	5.1 km/h (3.1 mph)
		Low speed	3.0 km/h (1.9 mph)
	Traction force	High speed	16.8 metric tons (18.52 tons)
		Low speed	26.3 metric tons (28.99 tons)
	Gradeability		35° (70% slope)
	Ground pressure		.54 kg/sq cm (7.68 psi)
Ground clearance			773 mm (2’ - 7")
Lever operation style			Hydraulic joystick
Upper roller			2 per track
Bottom roller			9 per track

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GENERAL MAINTENANCE PROCEDURES

⚠ CAUTION!
Follow all safety recommendations and safe shop practices outlined in the front of this manual or those contained within this section. **Always use tools and equipment that is in good working order.** **Use lifting and hoisting equipment capable of safely handling load.** **Remember, that ultimately safety is your own personal responsibility.**

MODEL	SERIAL NUMBER RANGE
ALL MODELS	ALL RANGES

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TORQUE VALUES FOR STANDARD METRIC FASTENERS

NOTE: *The units for the torque values are kg m (ft lb)*

Grade Dia. x Pitch (mm)	3.6 (4A)	4.6 (4D)	4.8 (4S)	5.6 (5D)	5.8 (5S)	6.6 (6D)	6.8 (6S)	6.9 (6G)	8.8 (8G)	10.9 (10K)	12.9 (12K)
M5 x Std.	0.15 (1.08)	0.16 (1.15)	0.25 (1.80)	0.22 (1.59)	0.31 (2.24)	0.28 (2.02)	0.43 (3.11)	0.48 (3.47)	0.50 (3.61)	0.75 (5.42)	0.90 (6.50)
M6 x Std.	0.28 (2.02)	0.30 (2.16)	0.45 (3.25)	0.40 (2.89)	0.55 (3.97)	0.47 (3.39)	0.77 (5.56)	0.85 (6.14)	0.90 (6.50)	1.25 (9.04)	1.50 (10.84)
M7 x Std.	0.43 (3.11)	0.46 (3.32)	0.70 (5.06)	0.63 (4.55)	0.83 (6.00)	0.78 (5.64)	1.20 (8.67)	1.30 (9.40)	1.40 (10.12)	1.95 (14.10)	2.35 (16.99)
M8 x Std.	0.70 (5.06)	0.75 (5.42)	1.10 (7.95)	1.00 (7.23)	1.40 (10.12)	1.25 (9.04)	1.90 (13.74)	2.10 (15.18)	2.20 (15.91)	3.10 (22.42)	3.80 (27.48)
M8 x 1	0.73 (5.28)	0.80 (5.78)	1.20 (8.67)	1.00 (7.23)	1.50 (10.84)	1.35 (9.76)	2.10 (15.18)	2.30 (16.63)	2.40 (17.35)	3.35 (24.23)	4.10 (29.65)
M10 x Std.	1.35 (9.76)	1.40 (10.12)	2.20 (15.91)	1.90 (13.74)	2.70 (19.52)	2.35 (19.99)	3.70 (26.76)	4.20 (30.37)	4.40 (31.18)	6.20 (44.84)	7.20 (52.07)
M10 x 1	1.50 (10.84)	1.60 (11.57)	2.50 (18.08)	2.10 (15.18)	3.10 (22.42)	2.80 (20.25)	4.30 (31.10)	4.90 (35.44)	5.00 (36.16)	7.00 (50.63)	8.40 (60.75)
M12 x Std.	2.40 (17.35)	2.50 (18.08)	3.70 (26.76)	3.30 (23.86)	4.70 (33.99)	4.20 (30.37)	6.30 (45.56)	7.20 (52.07)	7.50 (54.24)	10.50 (75.94)	12.50 (90.41)
M12 x 1.5	2.55 (18.44)	2.70 (19.52)	4.00 (28.93)	3.50 (25.31)	5.00 (36.16)	4.50 (32.54)	6.80 (49.18)	7.70 (55.69)	8.00 (57.86)	11.20 (81.00)	13.40 (96.92)
M14 x Std.	3.70 (26.76)	3.90 (28.20)	6.00 (13.23)	5.20 (37.61)	7.50 (54.24)	7.00 (50.63)	10.00 (72.33)	11.50 (83.17)	12.00 (86.79)	17.00 (122.96)	20.00 (144.66)
M14 x 1.5	4.10 (29.65)	4.30 (31.10)	6.60 (47.73)	5.70 (41.22)	8.30 (60.03)	7.50 (54.24)	11.10 (80.28)	12.50 (90.41)	13.00 (94.02)	18.50 (11.26)	22.00 (158.12)
M16 x Std.	5.60 (40.50)	6.00 (43.39)	9.00 (65.09)	8.00 (57.86)	11.50 (83.17)	10.50 (75.94)	15.50 (112.11)	17.90 (129.47)	18.50 (133.81)	26.00 (188.05)	31.00 (224.22)
M16 x 1.5	6.20 (44.84)	6.50 (47.01)	9.70 (70.16)	8.60 (62.20)	12.50 (90.41)	11.30 (81.73)	17.00 (122.96)	19.50 (141.04)	20.00 (144.66)	28.00 (202.52)	35.50 (256.77)
M18 x Std.	7.80 (56.41)	8.30 (60.03)	12.50 (90.41)	11.00 (79.56)	16.00 (115.72)	14.50 (104.87)	21.00 (151.89)	27.50 (198.90)	28.50 (206.14)	41.00 (296.55)	43.00 (311.01)
M18 x 1.5	9.10 (65.82)	9.50 (68.71)	14.40 (104.15)	12.50 (90.41)	18.50 (133.81)	16.70 (120.79)	24.50 (177.20)	27.50 (198.90)	28.50 (206.14)	41.00 (296.55)	49.00 (354.41)
M20 x Std.	11.50 (83.17)	12.00 (86.79)	18.00 (130.19)	16.00 (115.72)	22.00 (159.12)	19.00 (137.42)	31.50 (227.83)	35.00 (253.15)	36.00 (260.38)	51.00 (368.88)	60.00 (433.98)
M20 x 1.5	12.80 (92.58)	13.50 (97.64)	20.50 (148.27)	18.00 (130.19)	25.00 (180.82)	22.50 (162.74)	35.00 (253.15)	39.50 (285.70)	41.00 (296.55)	58.00 (419.51)	68.00 (491.84)
M22 x Std.	15.50 (112.11)	16.00 (115.72)	24.50 (177.20)	21.00 (151.89)	30.00 (216.99)	26.00 (188.05)	42.00 (303.78)	46.00 (332.71)	49.00 (354.41)	67.00 (484.61)	75.00 (542.47)
M22 x 1.5	17.00 (122.96)	18.50 (133.81)	28.00 (202.52)	24.00 (173.59)	34.00 (245.92)	29.00 (209.75)	47.00 (339.95)	52.00 (44.76)	56.00 (405.04)	75.00 (542.47)	85.00 (614.80)
M24 x Std.	20.50 (148.27)	21.50 (155.50)	33.00 (238.68)	27.00 (195.29)	40.00 (289.32)	34.00 (245.92)	55.00 (397.81)	58.00 (419.51)	63.00 (455.67)	82.00 (593.10)	92.00 (655.43)
M24 x 1.5	23.00 (166.35)	35.00 (253.15)	37.00 (267.62)	31.00 (224.22)	45.00 (325.48)	38.00 (202.52)	61.00 (441.21)	67.00 (484.61)	74.00 (535.24)	93.00 (672.66)	103.00 (744.99)

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REMOVAL

⚠ CAUTION!

Avoid disassembling cab if there are strong wind gusts, which could catch large surface area of cab shell and push it sideways during lift.

1. Park on firm and level ground.
2. Lower bucket to ground.
3. Shut engine down and remove key from starter switch.

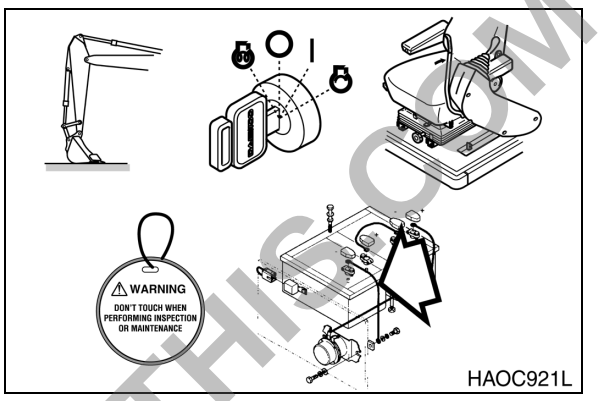


Figure 1

⚠ WARNING!

If engine must be run while performing maintenance, use extreme care. Always have one person in the cab at all times. Never leave the cab with the engine running.

4. Set safety lever on "LOCK" position.
5. Hang maintenance warning tag on controls.
6. Disconnect negative (-) battery cable leading to frame from battery.
7. Prepare cab shell for removal by disconnecting wiring connectors for:
   - A. Cab interior lighting.
   - B. External light wiring.
   - C. Radio antenna and connections.
   - D. Wiper/washer connections.

NOTE: *Control console wiring harnesses and hydraulic piping lines that pass through the floor of the cab do not need to be disassembled.*

NOTE: *If unit is equipped with a cab protective structure (for forestry, or hazardous working conditions), it must be removed.*

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Symptoms	Possible Causes	Remedies
1. No rotation and –		
a. Pressure at swing motor inlet *increases*	Swing brake not releasing	Check brake engagement and disengagement, check release pressure
	Internal damage to gearbox drive train	Replace broken gears, drive train assemblies
	Overload	Reduce load weight
b. Pressure at swing motor inlet shows *no increase,* **and** the swing motor is making irregular noises	Swing motor drive shaft damage	Replace swing motor
	Internal damage to gearbox drive train	Repair/replace broken or faulty assemblies
c. Pressure at swing motor inlet shows *no increase,* but **without** irregular *noises* from the swing motor	Hydraulic pump or valve broken	Troubleshoot hydraulic system
2. Oil leakage		
a. From drive shaft	Oil seal damaged	Replace oil seal
b. From bolted connections or other assembled surfaces	Assembly compound (joint sealer) old and not sealing, bolt not tight or flange warped	Disassemble and check mating surfaces. Reapply Loctite, torque bolts to specifications
3. Excess heat		
Gearbox casing becomes excessively hot, with or without irregular noise(s) during operation	Low oil level	Replace oil, refill to specified level
	Bearings or gear worn but not completely inoperative	Repair or replace gearbox

HAOE960L

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GENERAL DESCRIPTION

Schematic(s) presented in this section are laid out on facing pages.

An overlapping edge has been taken into consideration so that a photocopy can be made and pasted together to make a complete schematic.

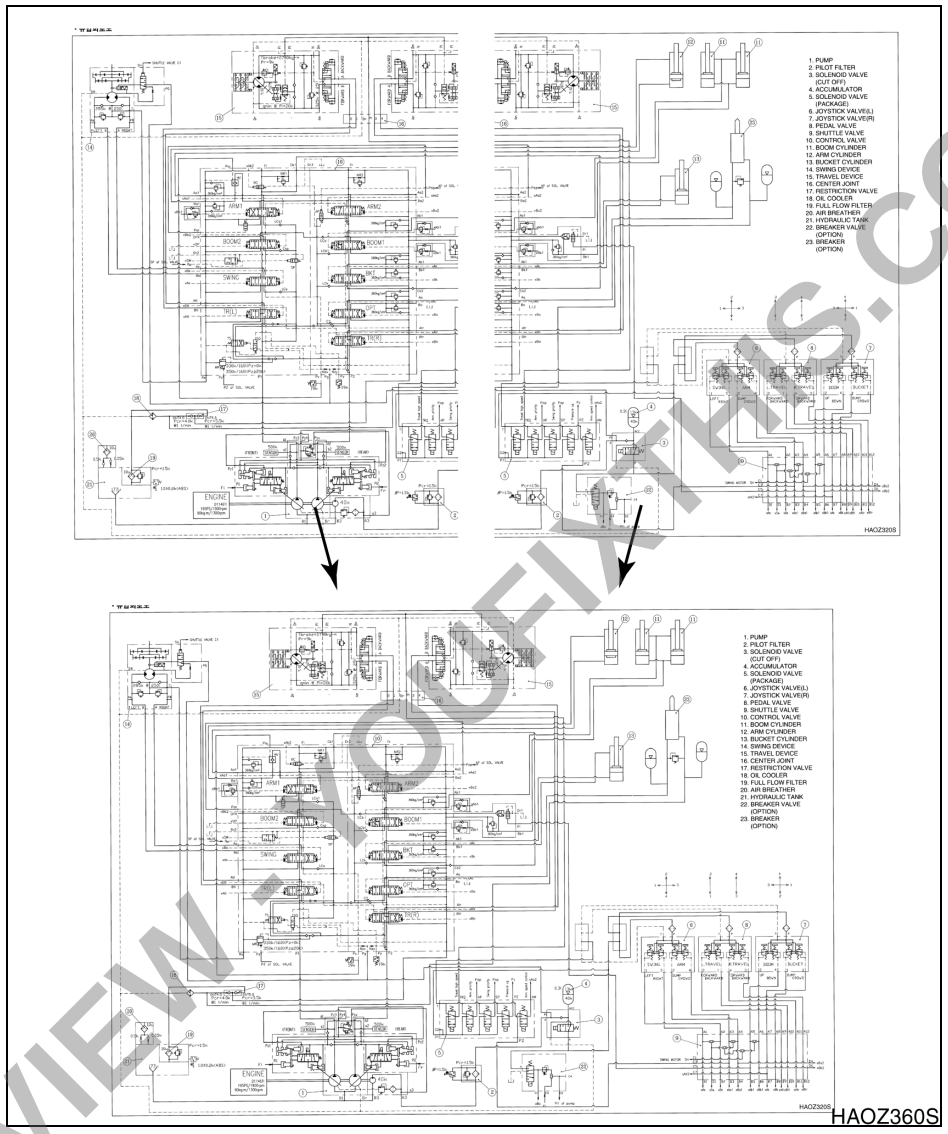


Figure 1

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Main Pump (With Regulator).....S0708300

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TRACK EXCAVATOR SAFETY

⚠ CAUTION!

Follow all safety recommendations and safe shop practices outlined in the front of this manual or those contained within this section.

Always use tools and equipment that is in good working order.

Use lifting and hoisting equipment capable of safely handling load.

Remember, that ultimately safety is your own personal responsibility.

MODEL	SERIAL NUMBER RANGE
Solar 220LL	1001 and Up
Solar 290LL	1001 and Up

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WELDING PRECAUTIONS AND GUIDELINES

IMPORTANT

To avoid accidents, personal injury and the possibility of causing damage to the excavator or to components, welding must only be performed by properly trained and qualified personnel, who possess the correct certification (when required) for the specific welding fabrication or specialized repair being performed.

⚠ WARNING!

Structural elements of the excavator may be built from a variety of steels. These could contain unique alloys or may have been heat treated to obtain particular strength characteristics. It is extremely important that welding repairs on these types of steel are performed with the proper procedures and equipment. If repairs are performed incorrectly, structural weakening or other damage to the excavator (that is not always readily visible) could be caused. Always consult Daewoo After Sales Service before welding on integral components (car body, track frames, turntable, attachment) of the excavator. It is possible that some types of structurally critical repairs may require Magnetic Particle or Liquid Penetrant testing, to make sure there are no hidden cracks or damage, before the excavator can be returned to service.

⚠ CAUTION!

Always perform welding procedures with the proper safety equipment on hand. Adequate ventilation and a dry work area are absolutely essential. Keep a fire extinguisher nearby and always wear protective clothing and the recommended type of eye protection.

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16. Install two 12 mm eye bolts in threaded holes at that bolts (1 and 2, Figure 11) came out of. Using a suitable lifting device, sling eye bolts.

17. Remove four bolts and washers (4) holding tank (3) to frame. Lift tank 25 mm (1") and make sure it is balanced. Make sure that there are no other electrical wires or hoses connected to tank. Completely remove tank after inspection.

    NOTE: *The clear level gauge on the side of the tank is easily damaged. Be careful of obstacles and wind gusts.*

18. Remove shims (5).

    NOTE: *If tank is to be reused note position and amount of shims used for each mounting bolt location.*

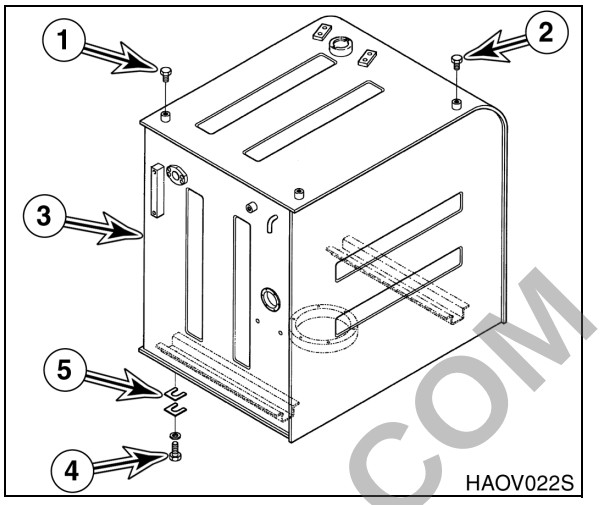


Figure 11

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AIR-CONDITIONER

⚠ CAUTION!

Follow all safety recommendations and safe shop practices outlined in the front of this manual or those contained within this section.

Always use tools and equipment that is in good working order.

Use lifting and hoisting equipment capable of safely handling load.

Remember, that ultimately safety is your own personal responsibility.

MODEL	SERIAL NUMBER RANGE
Solar 130LC-V	0001 and Up
Solar 130W-V	0001 and Up
Solar 220LC-V	0001 and Up
Solar 220LL	1001 and Up
Solar 290LC-V	0001 and Up
Solar 290LL	1001 and Up
Solar 330LC-V	1001 and Up
Solar 400LC-V	1001 and Up
Solar 55	0001 and Up

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Problem	Possible Causes	Remedies
Pressure at swing motor inlet increases.	Swing brake not releasing.	Check brake engagement and disengagement; check release pressure.
	Internal damage to gearbox drive train.	Replace broken gears and drive train assemblies.
	Overload.	Reduce load weight.
Pressure at swing motor inlet shows no increase, and the swing motor is making irregular noises.	Swing motor drive shaft damage.	Replace swing motor.
	Internal damage to gearbox drive train.	Repair/Replace broken or faulty assemblies.
Pressure at swing motor inlet shown no increase, but without irregular noises from the swing motor.	Hydraulic pump or valve problem.	Troubleshoot hydraulic system.
Oil Leakage:		
From drive shaft From bolted connections or other assembled surfaces.	Oil seal damaged Assembly compound (joint sealer) old and not sealing, bolt not tight or flange warped.	Replace oil seal Disassemble and check mating surfaces. Reapply Loctite; torque bolts to specifications.
Excess heat:		
Gearbox casing becomes excessively hot, with or without irregular noise (s), during operation.	Low oil level.	Replace oil; refill to specified level.
	Bearings or gears worn but not completely inoperative.	Repair or replace gearbox.

TROUBLESHOOTING – HYDRAULIC PROBLEMS

Problem	Possible Causes	Remedies
Attachment cylinders, swing and travel motors are all inoperable. Loud noises are heard from main pump assembly.	Main pump (s) malfunction	Repair or replace
	Low oil level in hydraulic system	Refill
	Main pump inlet (oil supply) piping or hose damaged	Repair or replace
Attachment cylinders, swing and travel motors are all inoperable. No usual or loud noises can be heard.	Pilot pump malfunction	Repair or replace
	Pilot cutoff solenoid stuck	Repair or replace
	Pilot cutoff switch faulty	Repair or replace
	Engine/pump flex coupling damaged	Replace flex coupling
Sluggish performance of all hydraulic functions – attachment, swing and travel.	Main pump (s) damaged or worn	Repair or replace
	Main relief valve pressure off	Readjust pressure
	Low oil level in hydraulic system	Refill
	Hydraulic reservoir intake strainer clogged	Clean
	Pump inlet (supply side) piping or hose allowing air into hydraulic system	Tighten connection

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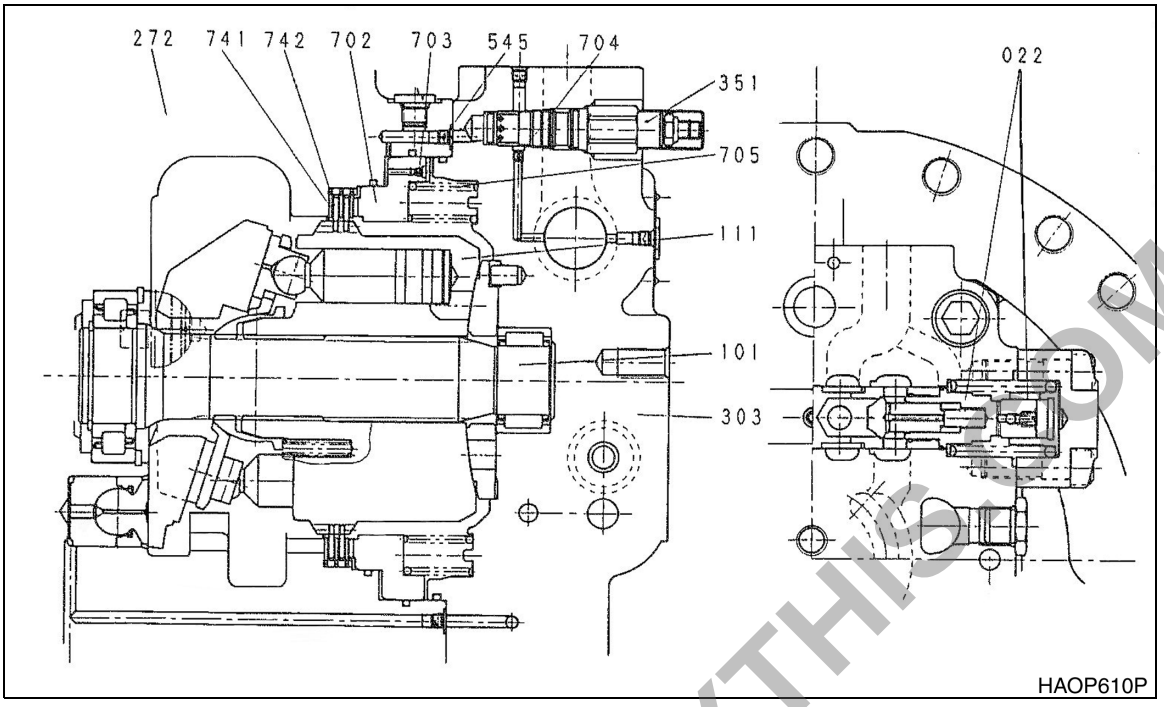


Figure 4

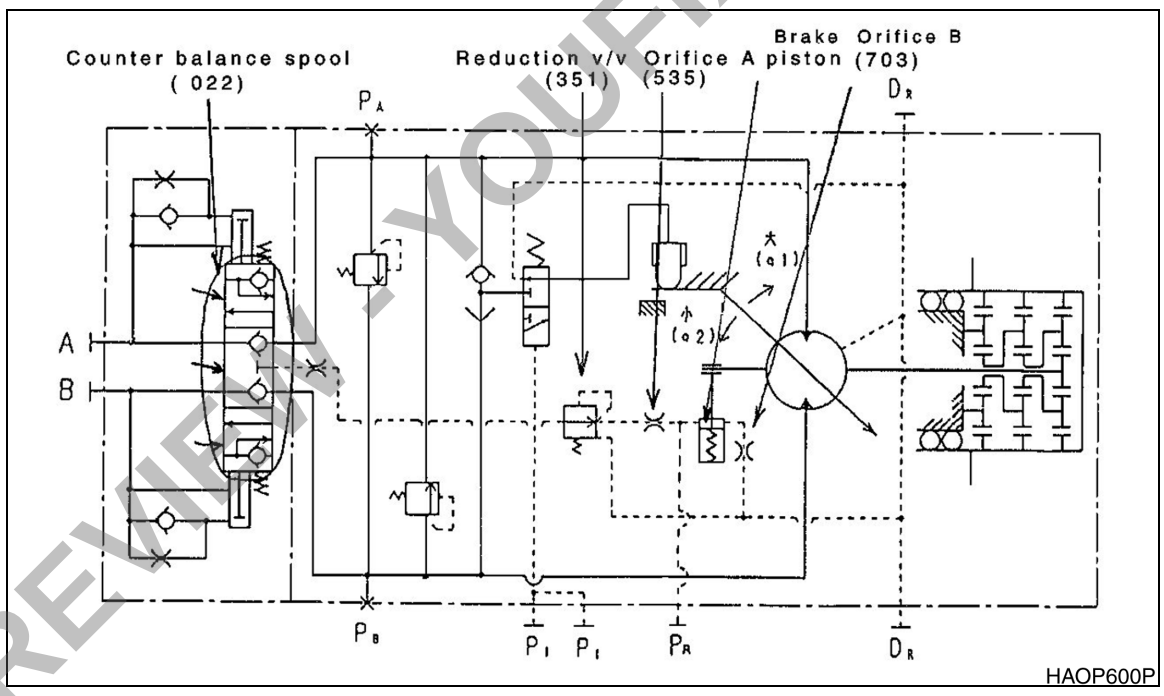


Figure 5

At that time, the hydraulic oil in the brake piston is drained through the throttle B (703). Therefore, the brake operation is delayed after spool being in the neutral. The damage of friction plate is absorbed shock, because the machine stops in a while.

4. How to manually release the negative brake.

   To release the brake if there is no available hydraulic pressure, refer to the following operation point.

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- The pump cylinder block slides into the valve plate whenever piston stroke is tilted past the “0” swash plate angle, to allow flow of supply oil (input) and positive discharge (output) through the pump.

Main Pump Output: 132 cc/rev (1 pump)

Gear (Pilot) Pump Output: 10 cc/rev

Pilot Pump Relief Valve: Relief pressure set at 40 kg/cm^2 (569 psi).

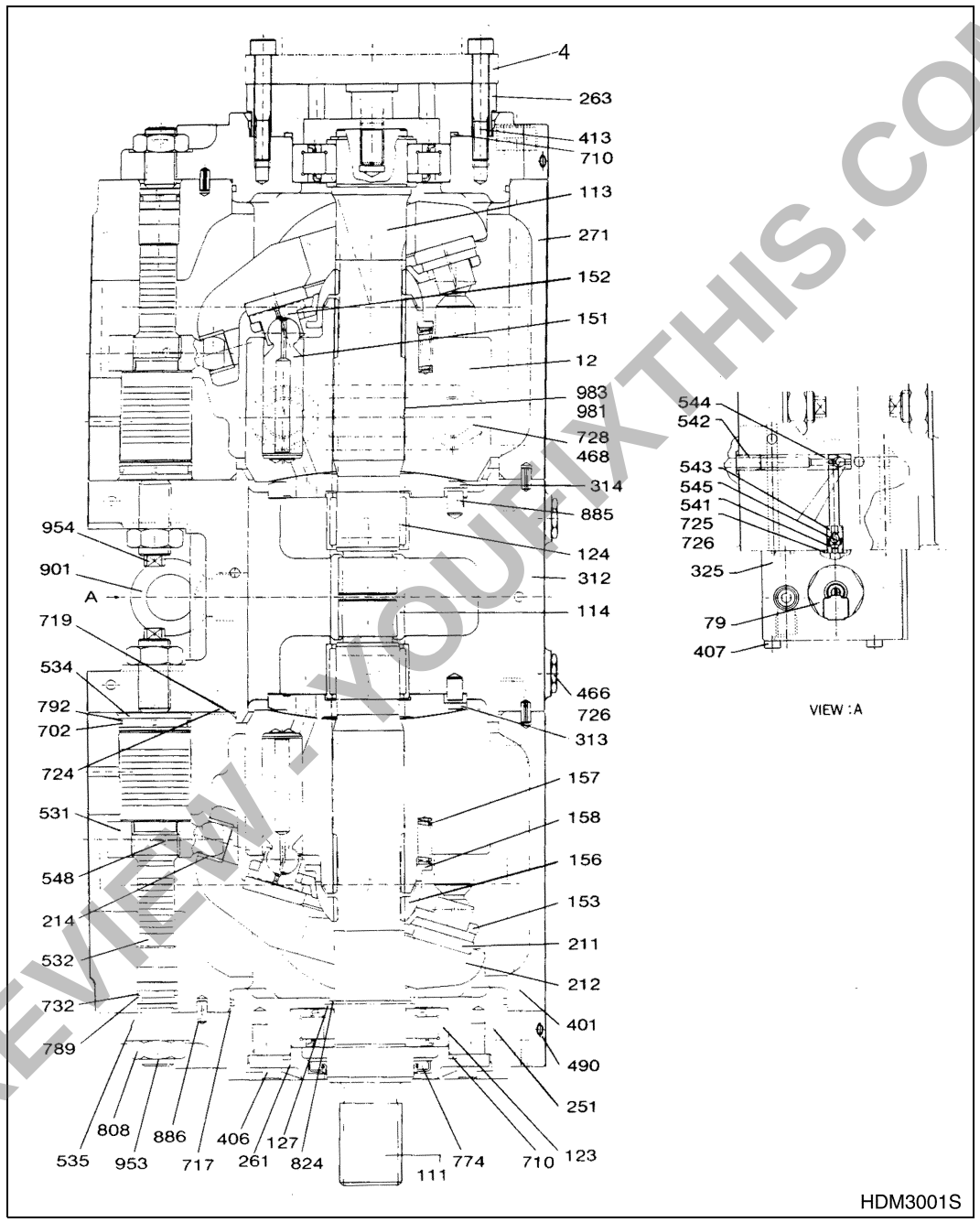


Figure 2

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TRAVEL CONTROL VALVE (RCV8C4015A)

⚠ CAUTION!

Follow all safety recommendations and safe shop practices outlined in the front of this manual or those contained within this section.

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Use lifting and hoisting equipment capable of safely handling load.

Remember, that ultimately safety is your own personal responsibility.

MODEL	SERIAL NUMBER RANGE
Solar 130LC-V	0001 and Up
Solar 220LC-V	0001 and Up
Solar 220LL	1001 and Up
Solar 290LC-V	0001 and 0760
Solar 290LL	1001 and 1020
Solar 330LC-V	1001 and 1023
Solar 400LC-V	1001 and 1010

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When the start switch is in the ‘OFF’ position, the internal components of the engine stop motor‘s cam switch is in the position shown.

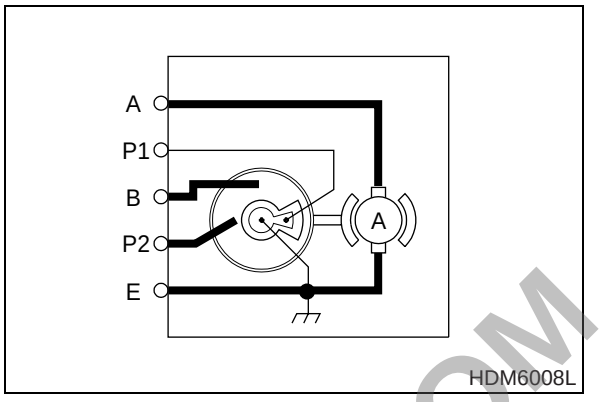


Figure 8

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