SEBM004600K

SHOP MANUAL

PC03-2

HYDRAULIC EXCAVATOR

MACHINE MODEL	SERIAL No.
PC03-2	15001 and up

⚠ WARNING

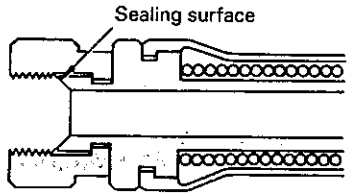
Unsafe use of this machine may cause serious injury or death. Operators and maintenance personnel must read this manual before operating or maintaining this machine. This manual should be kept inside the cab for reference and periodically reviewed by all personel who will come into contact with the machine.

KOMATSU

kgm

3. TIGHTENING TORQUE FOR NUTS OF FLARED

Use these torques for nut part of flared.



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Thread diameter of nut part (mm)	Width across flats of nut part (mm)	Tightening torque	
		kgm	Nm
14	19	2.5±0.5	24.5±4.9
18	24	5±2	49±19.6
22	27	8±2	78.5±19.6
24	32	14±3	137.3±29.4
30	36	18±3	176.5±29.4
33	41	20±5	196.1±49
36	46	25±5	245.2±49
42	55	30±5	294.2±49

COATING MATERIALS

The recommended coating materials prescribed in Komatsu Shop Manuals are listed below.

Nomenclature	Komatsu code	Applications
Adhesives	LT-1A	Used to apply rubber pads, rubber gaskets, and cork plugs.
	LT-1B	Used to apply resin, rubber, metallic and non-metallic parts when a fast, strong seal is needed.
	LT-2*	Preventing bolts, nuts and plugs from loosening and leaking oil.
	LT-3	Provides an airtight, electrically insulating seal. Used for aluminum surfaces.
	LT-4	Used to coat plugs (plate shaped, bowl shaped) and holes, and mating portion of shaft.
Sealant gasket	LG-1	Used with gaskets and packings to increase sealing effect.
	LG-3	Heat-resistant gasket for precombustion chambers and exhaust piping.
	LG-4	Used by itself on mounting surfaces on the final drive and transmission cases. (Thickness after tightening: 0.07 — 0.08 mm)
	LG-5	Used by itself to seal grease fittings, tapered screw fittings and tapered screw fittings in hydraulic circuits of less than 50 mm in diameter.
	LG-6	Silicon base type used in combination with LG-1 and LG-4.
	LG-7	Has a shorter curing time than LG-6, and is easier to peel off.
Antifriction compound (Lubricant including molybdenum disulfide)	LM-P	Applied to bearings and taper shafts to facilitate press-fitting and to prevent sticking, burning or rusting.
Grease (Lithium grease)	G2-LI	Applied to bearings, sliding parts and oil seals for lubrication, rust prevention and facilitation of assembling work.
Vaseline	—	Used for protecting battery electrode terminals from corrosion.

*LT-2 is also called LOCTITE in the shop manuals.

SPECIFICATIONS

Machine model				PC03-2
Serial number				15001 and up
	Operating weight		(kg)	740
	Bucket capacity		(m^3)	0.02
Performance	Working ranges	Max. digging depth	(mm)	1,500
		Max. vertical wall depth	(mm)	1,170
		Max. digging reach	(mm)	2,840
		Max. reach at ground level	(mm)	2,760
		Max. digging height	(mm)	2,790
		Max. dumping height	(mm)	1,990
		Bucket offset	(mm)	Left: 460/ Right: 390
		Max. blade lifting height	(mm)	155
		Max. blade lowering depth	(mm)	175
	Max. digging force		(kN(kg))	9.3 (950)
	Swing speed		(rpm)	7.5
	Max. slope angle for swinging		(deg.)	25
	Travel speed		(km/h)	1.9
	Gradeability		(deg.)	30
	Ground pressure (standard shoe width)		(MPa(kg/cm^2))	0.02 (0.20 (180 mm))
Dimensions	Overall length (for transport)		(mm)	2,730
	Overall width		(mm)	800
	Overall height (for transport)		(mm)	1,220
	Overall height		(mm)	1,220
	Ground clearance, counterweight		(mm)	350
	Min. ground clearance		(mm)	170
	Tail swing radius		(mm)	770
	Min. swing radius of work equipment		(mm)	1,050
	Height of work equipment at min. swing radius		(mm)	2,150
	Length of track on ground		(mm)	900
	Track gauge		(mm)	620
	Overall length of track		(mm)	1,222
	Blade width × height		(mm)	800 × 220

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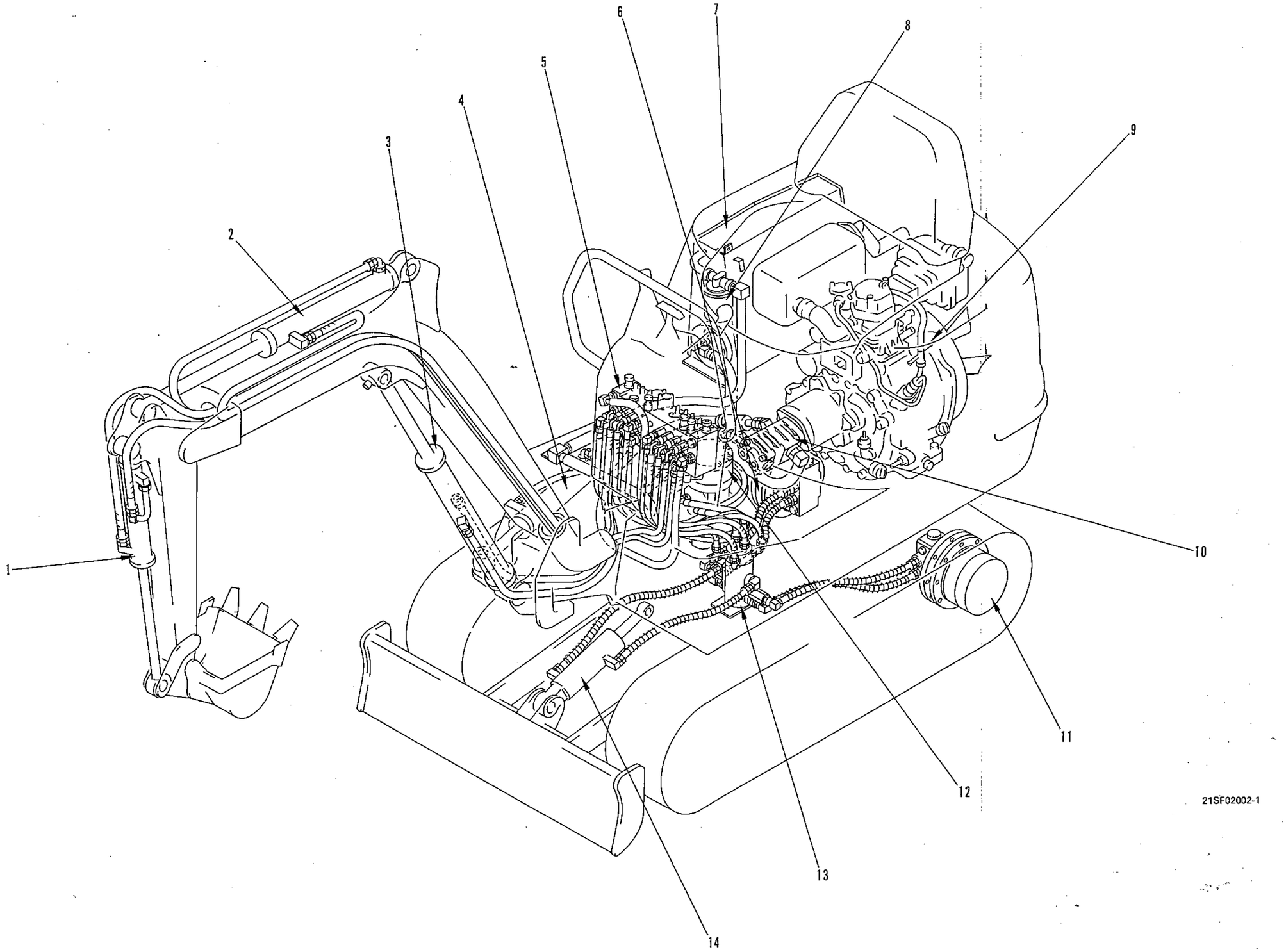
HYDRAULIC PIPING



1. Bucket cylinder
2. Arm cylinder
3. Boom cylinder
4. Boom swing cylinder
5. 9-spool control valve
6. R.H. travel motor
7. Hydraulic tank
8. Hydraulic filter
9. Engine
10. Hydraulic pump
11. L.H. travel motor
12. Swing motor
13. Center swivel joint
14. Blade cylinder

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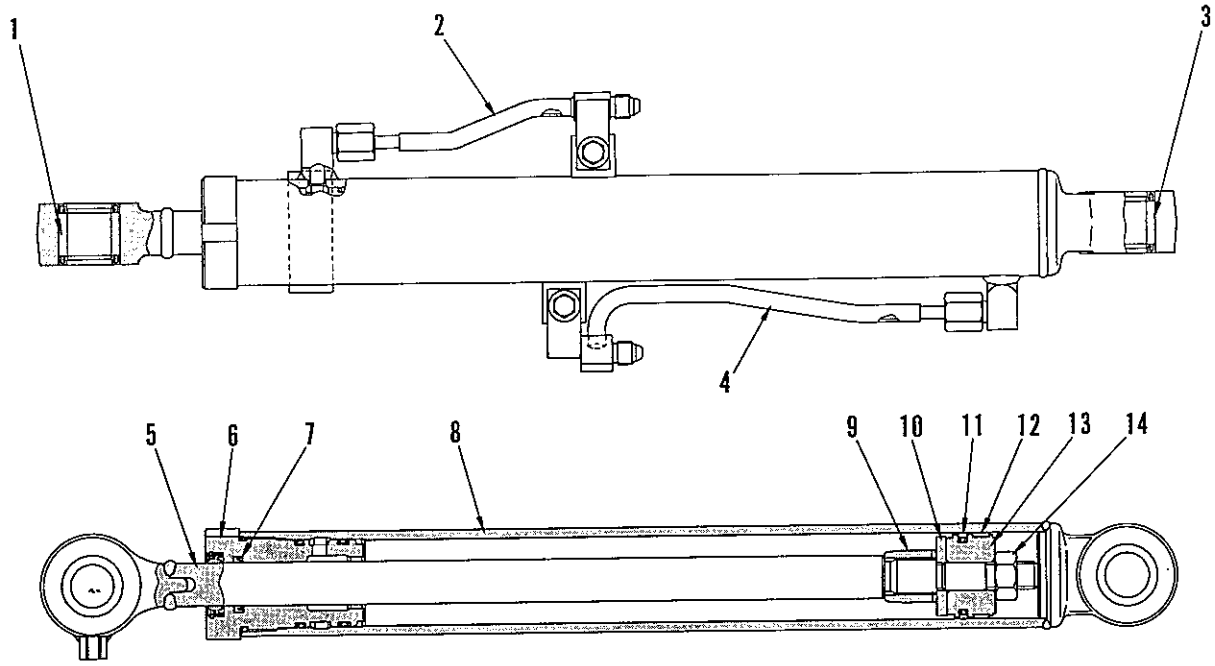
HYDRAULIC CYLINDER

* The diagram shows the boom cylinder.



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1. Head bushing
2. Head tube
3. Bottom bushing
4. Bottom tube
5. Piston rod
6. Cylinder head
7. Rod packing
8. Cylinder
9. Cushion plunger
10. Spacer
11. Piston ring
12. Wear ring
13. Piston
14. Piston nut

SPECIFICATIONS

Unit: mm

Item / Cylinder	Outside diameter of piston rod	Inside diameter of cylinder	Stroke	Max. stroke	Min. stroke	Width across flat of piston nut
Boom	25	50	330	930	600	24
Arm	25	50	350	935	585	27
Bucket	25	50	292	840	548	27
Boom swing	25	50	280	780	500	27
Blade	25	50	70	370	300	27

20 TESTING AND ADJUSTING

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★ The following precautions are necessary when using the STANDARD VALUE TABLE for testing and adjusting, or for troubleshooting.

1. The values in the table are for new machines, and are obtained from reference values at delivery from the factory. Therefore, they should be used as target values for judging the progress of wear, or when repairing the machine.
2. The values for judging failures are based on standards at machine delivery from the factory, and on the results of various tests. These values should be used as a reference together with the repair condition and operating record of the machine to make judgements on failures.
3. The values in the table should not be used for judging claims.

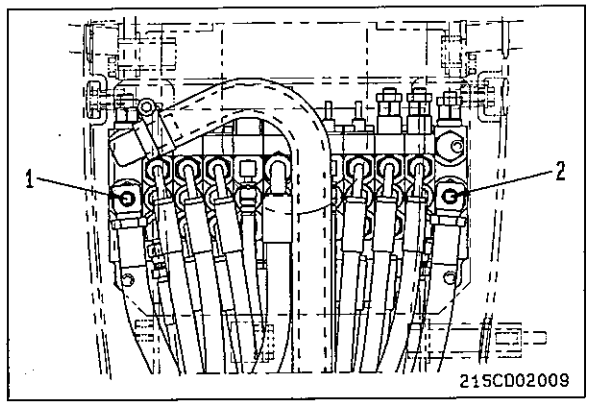
⚠ When carrying out testing, adjusting or troubleshooting, stop the machine on level ground, install the safety pins and block the tracks.

⚠ When working in groups, use agreed signals and do not allow unauthorized persons near the machine.

⚠ Be careful not to get caught in the fan or other rotating parts.

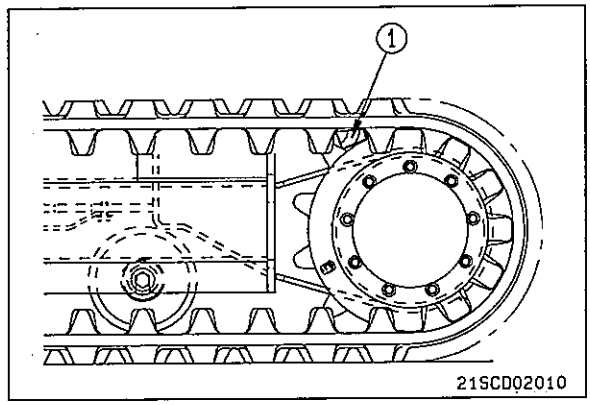
TESTING AND ADJUSTING OIL PRESSURE IN WORK EQUIPMENT, SWING, AND TRAVEL CIRCUITS

⚠ Lower the work equipment completely to the ground and stop the engine. Operate the control levers several times to release the remaining pressure in the hydraulic piping. Then loosen the oil filler plug slowly to release the pressure inside the hydraulic tank.



1. Measuring

1) Remove pressure pickup plugs (1) or (2) from the circuit to be measured, then install oil pressure gauge **C1** (200 kg/cm2).
   - Plug (1): For bucket, boom, R.H. travel, boom swing
   - Plug (2): For L.H. travel, arm, blade, (swing)
2) Start the engine, run itat full throttle, then operate the control lever of the circuit to be measured, and measure the relief pressure.
   - ★ For the swing circuit, measure the relief pressure of the safety valve. (The set pressure of the safety valve is lower than the pressure of the main relief valve, so the main relief valve is not actuated.)
   - ★ When relieving the swing circuit, place the bucket against a pillar or block to prevent swinging.
     When relieving the travel circuit, fit block ① between the track shoe and sprocket to lock the track, and measure one side at a time.



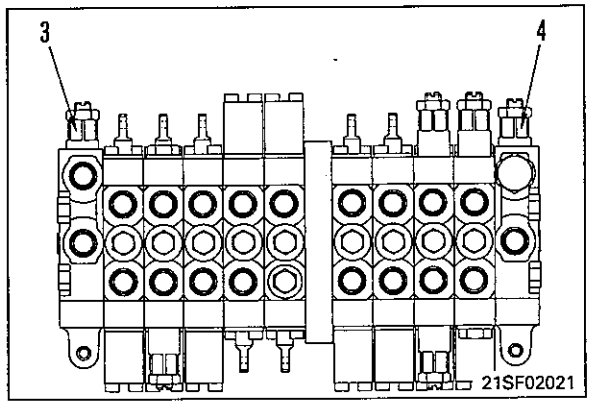
2. Adjusting

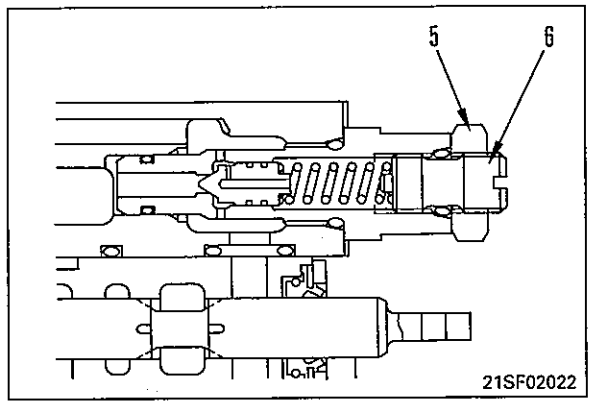
★ If the result of the inspection shows that there is an abnormality in the set pressure, adjust the set pressure of the main relief valve as follows.

1) Loosen locknut (5) of main relief valve (3) or (4) to be adjusted, then turn adjustmnet screw (6) to adjust the set pressure.
   - Valve (3): For bucket, boom, R.H. travel, boom swing
   - Valve (4): For L.H. travel, arm, blade, (swing)
   - ★ Adjust the pressure with the adjustment screw as follows.
     To INCREASE pressure, turn clockwise
     To DECREASE pressure, turn counterclockwise
   - ★ One turn of the adjustment screw adjusts the pressure by 7.6 MPa (78 kg/cm²).

   kgm Locknut: 11.27 ± 1.47 Nm (1.15 ± 0.15 kgm)

   - ★ After adjusting, repeat the procedure in Step 1 to check the set pressure again.





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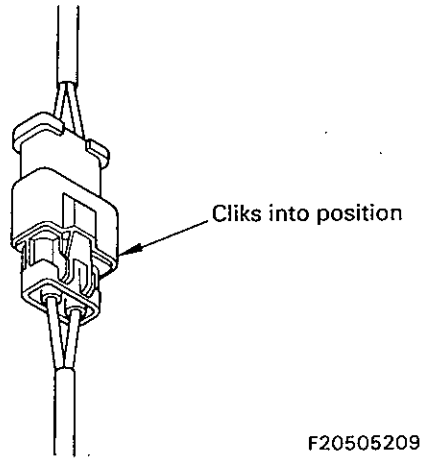
Connecting connectors

(1) Check the connector visually.
   a. Check that there is no oil, dirt, or water stuck to the connector pins (mating portion).
   b. Check that there is no deformation, defective contact, corrosion, or damage to the connector pins.
   c. Check that there is no damage or breakage to the outside of the connector.
   ★ If there is any oil, water, or dirt stuck to the connector, wipe it off with a dry cloth. If any water has got inside the connector, warm the inside of the wiring with a dryer, but be careful not to make it too hot as this will cause short circuits.
   ★ If there is any damage or breakage, replace the connector.

(2) Fix the connector securely.
   Align the position of the connector correctly, then insert it securely.
   For connectors with lock stopper
   Push in the connector until the stopper clicks into position.



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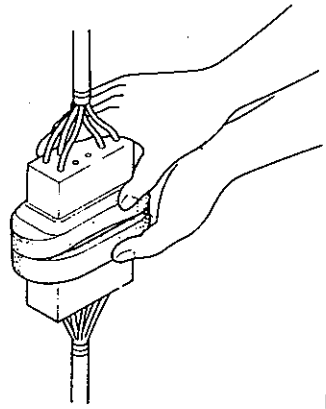
(3) Correct any protrution of the boot and any misalignment of the wiring harness
   For connectors fitted with boots, correct any protrusion or the boot. In addition, if the wiring harness is misaligned, or the clamp is out of position, adjust it to its correct position.
   ★ If the clamp cannot adjust its correct position easily, it disconnects and modifies.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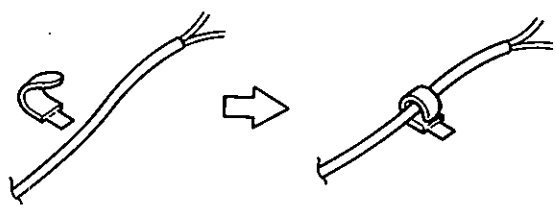
(4) When the wiring harness clamp of the connector has been removed, always return it to its original condition and check that there is no looseness of the clamp.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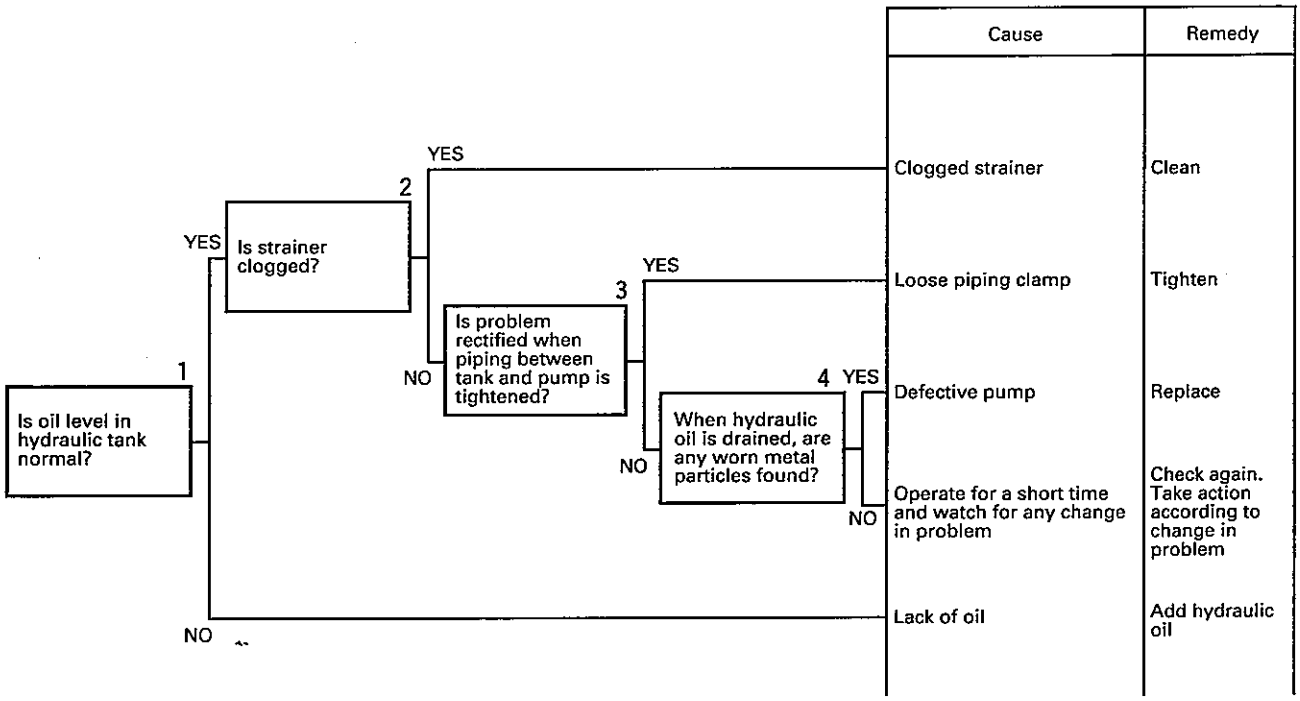
H-3 Abnormal noise generated (from around pump)



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H-4 Control lever is heavy

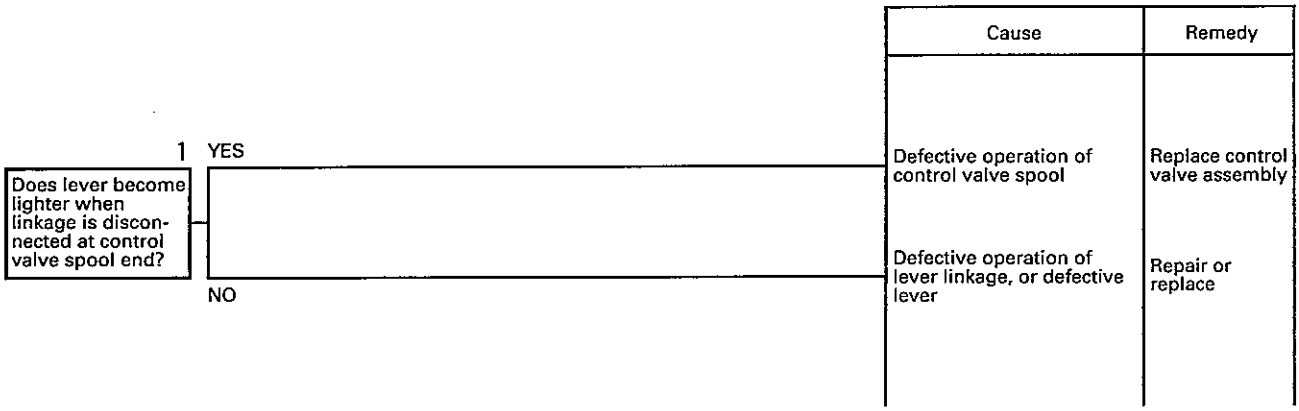

TABLE OF FAILURE MODES AND CAUSES

Failure mode \ Part causing failure			Pump	Strainer	Damper	Control valve					Linkage	Center swivel joint	Swing motor		Travel motor				Hydraulic cylinder	Hydraulic tank	Engine system	Troubleshooting code
						Control valve body	Spool	Main relief valve	Safety valve	Suction valve			Swing motor body	Internal leakage	Travel motor body	Brake valve	Internal leakage	Final drive				
All work equipment, travel, swing	Speeds of all work equipment, travel, swing are slow		○					○													○	H-1
	All work equipment, travel, swing lack power		○					○													○	H-1
	There is excessive drop in engine speed, or engine stalls		○																		○	H-2
	Work equipment, traveling, swinging do not function, or are extremely slow		○																		○	H-2
	Abnormal noise generated		○	○																○		H-3
	Control lever is heavy						○				○											H-4
Work equipment	Boom is slow						○		○	○									○			H-5
	Arm is slow						○		○	○									○			H-5
	Bucket is slow						○		○	○									○			H-5
	Excessive hydraulic drift						○		○	○									○			H-5
	Work equipment (boom, arm, bucket) lacks power						○		○	○												H-6
	Excessive time lag									○												H-7
Travel system	Travel deviation	Deviates in same direction in both forward and reverse	○			○	○	○			○	○			○			○				H-8a)
		Deviates in different direction in forward and reverse					○	○				○										H-8b)
	Travel lacks power (or speed is slow)		○				○	○			○										○	H-9
	Machine does not move (one side only)						○				○				○	○		○				H-10
Swing system	Does not swing	Both left and right					○						○	○								H-11
		One direction only							○				○									H-11
	Swing speed is slow or acceleration is poor	Both left and right					○							○								H-12
		One direction only							○				○									H-12
	Excessive overrun when stopping swing	Both left and right												○								H-13
		One direction only							○													H-13
	Excessive shock when stopping swing	Both left and right											○									H-14
		One direction only							○													H-14
	Excessive abnormal noise when stopping swing	Both left and right																				H-15
		One direction only							○	○												H-15
	Excessive hydraulic drift of swing						○			○				○								H-16
	Excessive hydraulic drift of boom swing						○			○									○			H-17

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TROUBLESHOOTING OF HYDRAULIC BREAKER

No.	Problem	Main causes	Remedy
1	Does not carry out impacting	• Defective operation of control valve • Broken control valve • Insufficient hydraulic oil • Loose nut (Item No. 7 of "Structure")	• Disassemble and check sliding of valve body, control valve • Replace • Add oil • Tighten
2	Impact force is weak, impact frequency is low	• Engine speed is low • Defective operation of control valve • Seizure of chisel • Chisel is warped	• Raise engine speed • Same as No. 1 • Remove, repair seized part, coat with grease • Straighten
3	Impact frequency is normal but impact force is weak	• Drop in pressure of accumulator gas • Broken diaphragm in accumulator	• Charge with nitrogen gas. Pressure: 40 kg/cm^2 • Replace
4	• Excessive leakage of oil from chisel insertion port • Flow of small amount of black oil	• Worn U-packing • Damaged U-packing • Melted grease	• Replace • Rectify damage to hammer piston, replace packing • There is no abnormality
5	High-pressure hose vibrates abnormally	• Accumulator gas pressure is too high • Broken diaphragm in accumulator • Drop in pressure of accumulator gas	• Adjust. Pressure: 40 kg/cm^2 • Replace • Charge with nitrogen gas. Pressure: 40 kg/cm^2
6	Leakage of oil from joints of valve body, cylinder, accumulator	• Worn, hardened O-ring • Loose nuts or bolts	• Replace • Tighten

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REMOVAL OF ENGINE, MAIN PUMP ASSEMBLY

⚠ Disconnect the cable from the negative (-) terminal of the battery.

⚠ Lower the work equipment completely to the ground and stop the engine. Then loosen the oil filler plug slowly to release the pressure inside the hydraulic tank.

★ Mark all the piping with tags to prevent mistakes in the mounting position when installing.

1. Drain hydraulic oil.
   Hydraulic tank : 13.8 ℓ
2. Remove machine cover assembly.
   For details, see REMOVAL OF MACHINE COVER ASSEMBLY.
3. Remove counterweight.
   For details, see REMOVAL OF COUNTERWEIGHT ASSEMBLY.
4. Remove hydraulic tank assembly.
   For details, see REMOVAL OF HYDRAULIC TANK ASSEMBLY.
5. Remove muffler cover.
6. Disconnect fuel hose (1).
   ★ To prevent the fuel from leaking out, bend and tie the end of the fuel hose.
7. Remove fuel tank assembly.
   For details, see REMOVAL OF FUEL TANK ASSEMBLY.
8. Disconnect delivery hose (3) and suction hose (2) of main pump.
9. Disconnect solenoid wiring (4), fuel pump wiring (5), engine oil pressure wiring (6), engine ground connection (7), starting motor wiring (8), engine wiring (9).
10. Disconnect cable (11).
11. Remove engine mount nuts (12), and lift off engine assembly (13).
    ★ When raising the engine assembly, take care not to damage the water separator, fuel filter, and bracket.
    kg Engine, main pump assembly : 49.5 kg

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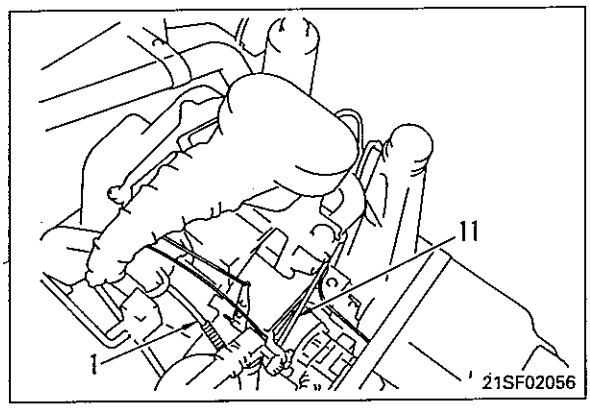
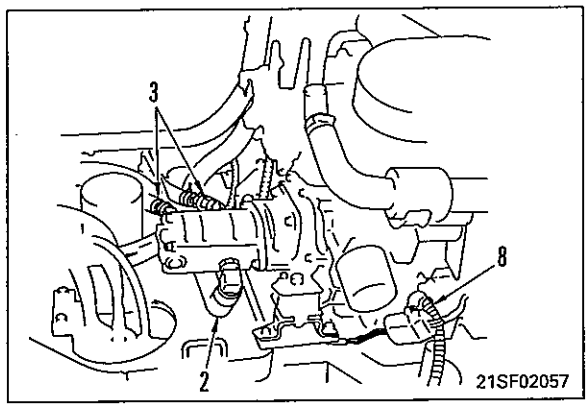
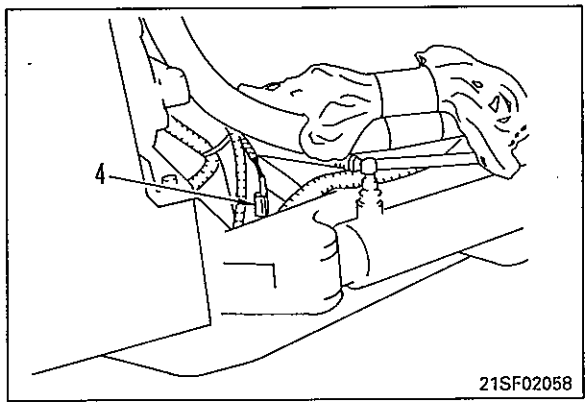
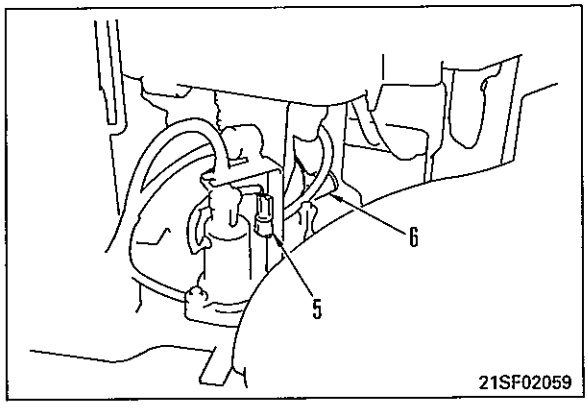




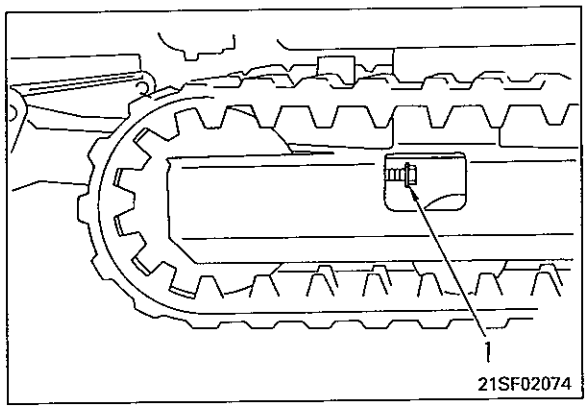




REMOVAL OF RUBBER SHOE ASSEMBLY

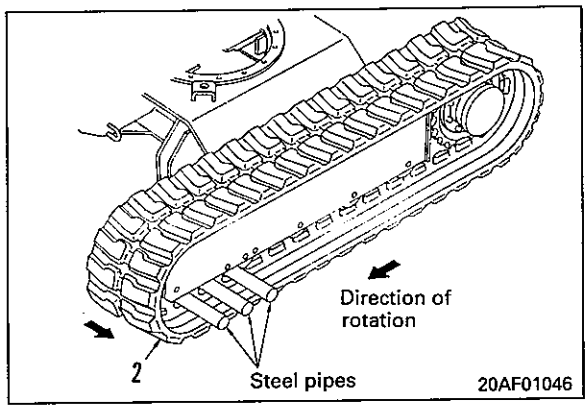
1. Lower work equipment to ground and loosen bolt (1) to relieve track shoe tension.
2. Swing work equipment 90°, and jack up chassis slightly.
3. Mesh steel pipes in rubber shoe (2), rotate sprocket in reverse so that steel pipes raise rubber shoe from idler, then slide track to side to remove rubber shoe.

kg Rubber shoe : 22 kg



INSTALLATION OF RUBBER SHOE ASSEMBLY

- Carry out installation in the reverse order to removal.



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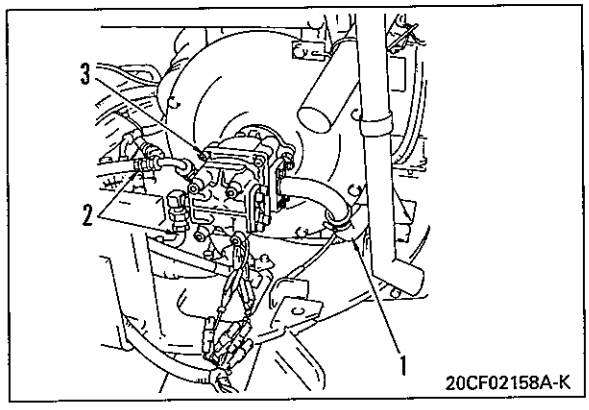
REMOVAL OF MAIN PUMP ASSEMBLY

⚠ Lower the work equipment to the ground and stop the engine. Loosen the oil filler plug slowly to release the pressure inside the hydraulic tank. Then set the safety lock lever to the LOCK position.

1. Drain hydraulic oil.

Hydraulic tank : 13.8 ℓ

2. Remove machine cover assembly.
   For details, see REMOVAL OF MACHINE COVER ASSEMBLY.
3. Disconnect pump inlet hose (1) and 2 outlet hoses (2).
4. Remove main pump assembly (3).



INSTALLATION OF MAIN PUMP ASSEMBLY.

- Carry out installation in the reverse order to removal.
- Refilling with oil (hydraulic tank)
  - ★ Add oil through oil filler to the specified level and run the engine to circulate the oil through the system. Then check the oil level again.

REMOVAL OF WORK EQUIPMENT ASSEMBLY

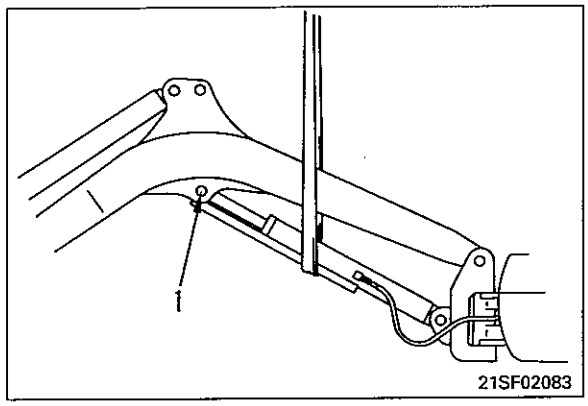
⚠ Extend the arm and bucket fully and lower the work equipment completely to the ground.

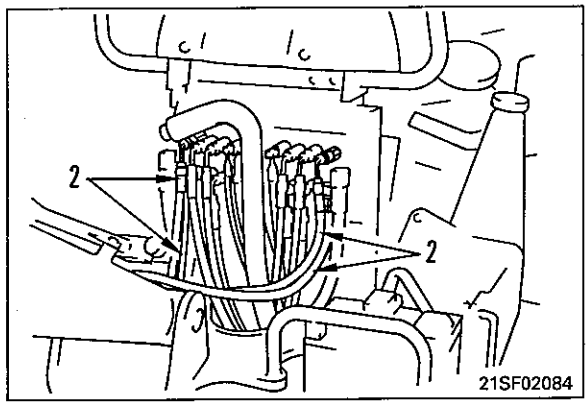
1. Remove pin (1). ※1 ※2
   ★ Note the number and thickness of the shims, and keep them in a safe place.
   ★ Sling the boom cylinder assembly and remove the pin.

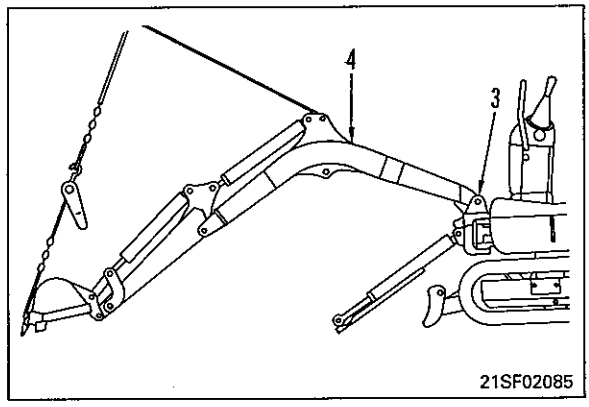
   ⚠ Start the engine, retract the boom cylinder rod, then tie the rod with wire to prevent it from coming out, and lower it onto a block.

   ⚠ Stop the engine and loosen the oil filler plug of the hydraulic tank slowly to release the pressure inside the hydraulic tank. Then set the safety lock lever to the LOCK position.
2. Disconnect hose (2).
   ★ Mark all the hoses with tags to prevent mistakes in the mounting position when installing.
3. Disconnect wiring.
4. Remove pin (3). ※3 ※4
   ★ Note the number and thickness of the shims, and keep them in a safe place.
   ★ Sling the work equipment assembly and remove the pin.
5. Remove work equipment assembly (4).

   kg Work equipment assembly : 74 kg







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INSTALLATION OF WORK EQUIPMENT ASSEMBLY

- Carry out installation in the reverse order to removal.

※1 ※3

⚠ When aligning the position of the pin hole, run the engine at low idling, and align slowly. Never insert your fingers in the pin holes.

※2 ※4

★ Insert the shims securely.

- Refilling with oil (hydraulic tank)
  ★ Add oil through oil filler to the specified level and run the engine to circulate the oil through the system. Then check the oil level again.
- Bleeding air
  ★ For details, see TESTING AND ADJUSTING, Bleeding air from hydraulic cylinder.

REMOVAL OF HYDRAULIC TANK ASSEMBLY

⚠ Lower the work equipment to the ground and stop the engine. Then loosen the oil filler plug slowly to release the pressure inside the hydraulic tank.

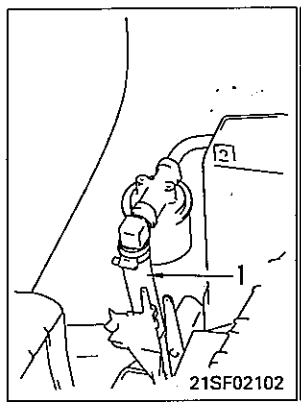
1. Drain hydraulic oil.

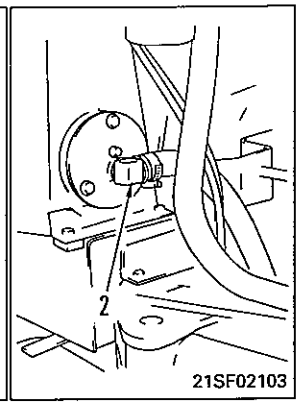
   Hydraulic tank : 13.8 ℓ

2. Remove left and right covers.
   For details, see REMOVAL OF MACHINE COVER ASSEMBLY.

3. Disconnect hoses (1) and (2).

4. Remove hydraulic tank assembly (3).





INSTALLATION OF HYDRAULIC TANK ASSEMBLY

- Carry out installation in the reverse order to removal.
- Refilling with oil (hydraulic tank)
  ★ Add oil through oil filler to the specified level and run the engine to circulate the oil through the system. Then check the oil level again.

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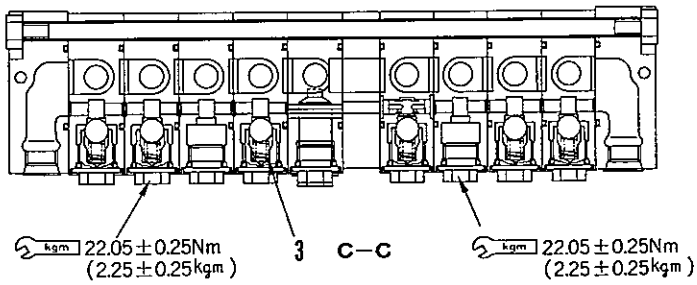

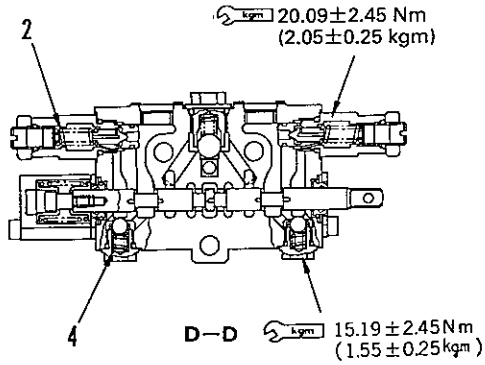

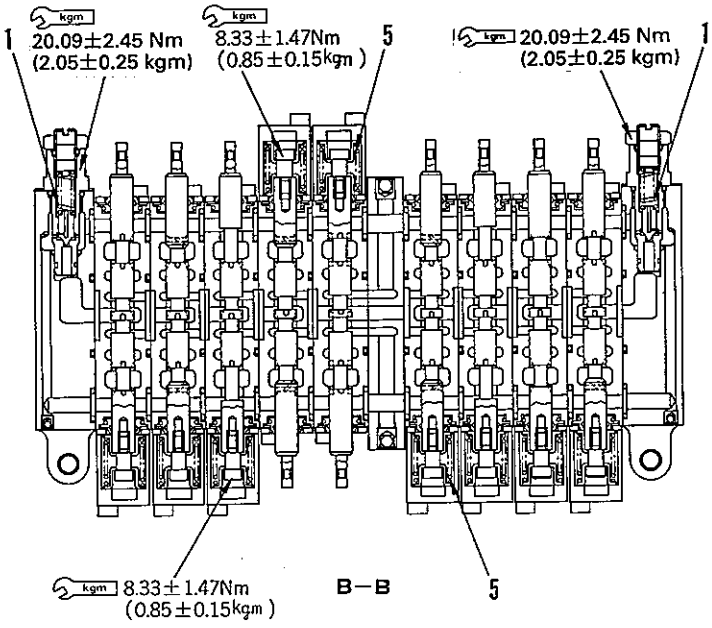

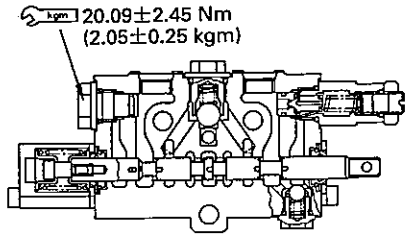

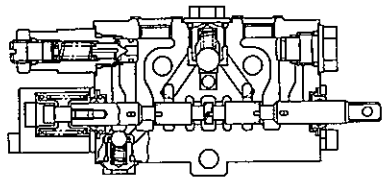

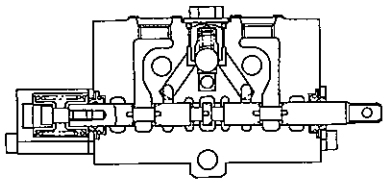

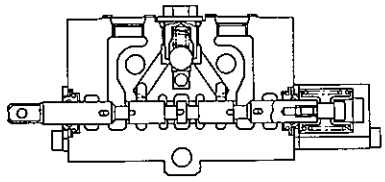

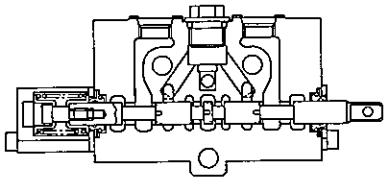

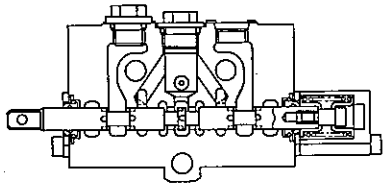

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21SF02034

Model			1D84-1
Type			Single-cylinder vertical 4 cycle diesel engine
Cooling system			Forced air cooling by flywheel fan
Combustion system			Direct injection system
Starting system			Cell motor start (Rope start in emergency)
Number of cylinders - Bore x Stroke		mm (in.)	1 - 84 x 70 (3.307 x 2.756)
Displacement		ℓ (cu.in.)	0.387 (23.6)
Continuous	Output	HP	8.0
	Crankshaft (Camshaft)	rpm	3600 (1800)
Maximum	Output	HP	9.0
	Crankshaft (Camshaft)	rpm	3600 (1800)
Speed at no-load, max/min		rpm	3750 ±50/1200 (crankshaft revolutions)
Compression ratio			19
PTO shaft	Revolutions		Crankshaft or camshaft (Camshaft PTO rpm is reduced by 50%)
	Direction of revolution		Counterclockwise viewed from PTO shaft
Fuel oil	Fuel injection pump		Bosch type, YANMAR YPFE-M without rolier guide
	Fuel injection timing(FID)	bTDC	15 ± 1
	Fuel injection nozzle		Hole nozzle
	Fuel injection pressure	kg/cm^2 (psi)	200 (2,845)
	Fuel oil selection		Diesel fuel BS 2869 A1 or equivalent
	Fuel oil filter		Paper element, FO tank built-in type
	Fuel oil tank capacity	ℓ (US gal)	5.5 (1.5)
Lubricating oil	Type of lubrication		Forced lubrication via trochoid pump; splash lubrication for valve rocker arm chamber
	Lubricating oil filter		Resin, 60 mesh
	Lubricating oil selection		SAE 10W 30, API grade CC or higher
	Lubricating oil capacity	ℓ (US qts.)	1.65 (1.74) (effective 0.6 (0.63))
Air cleaner system			Wet type paper element filter
Exhaust silencer			Expansion silencer (w/cover)
Governor			All speed governor, mechanical
Engine dimensions (Length x Width x Height)		mm (in.)	431 x 464 x 494 (16.968 x 18.268 x 19.449)
Dry weight		kg (lb)	50 (110.2)
Others	Permissible angle of inclination	deg	20 (Momentary 30)
	Balancer shaft		Single shaft
	Piston top clearance	mm (in.)	0.5 – 0.7 (0.0197 – 0.0276)
	Valve clearance (cold state)	mm (in.)	0.15 (0.0059)
	Cold weather starting aid		—

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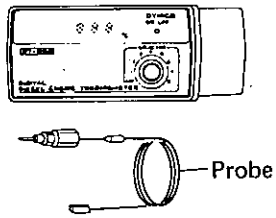
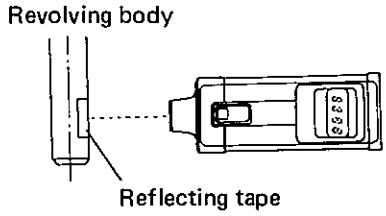
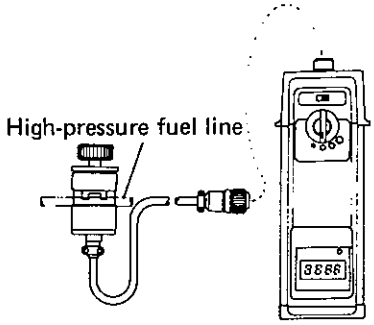
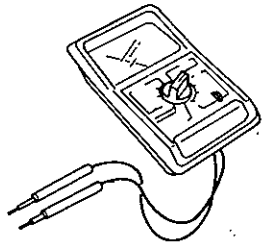
3. Instruments

(Select the appropriate thermometer and tachometer from among the following types.)

Instrument (Part No.)		Remarks	Illustration
Thermometer	Digital type Probe	Instantaneously measures temperature in each cylinder using a changeover switch. CA-64	
Tachometer	Photoelectric type (non-contacting) Reflecting tape (10 pieces)	Reflecting tape is applied to the outside of the rotating parts to measure RPMs. Capable of measuring RPM of reduction gears, step-up gears, and pulleys.	
	High-pressure fuel pipe clamping type Model GE-450	Measures engine RPM's using pulse system.	
Circuit tester		To measure resistance, DC voltage, AC voltage, DC current, and for continuity testing.	

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Tightening Torque kg-cm (lb-ft)
90–100 (5.8–7.2)

14. Intake pipe

Install the intake bend.

- Make sure the intake bend packing is in position.

15. Cooling fan case

1) Install the starter pulley.
2) Install the cooling fan case.
(Re-attach the recoil if it has been removed.)
   - Attach the seal rubber to the case.
   - Make sure the collar and fancase supporting rubber are in the proper position.

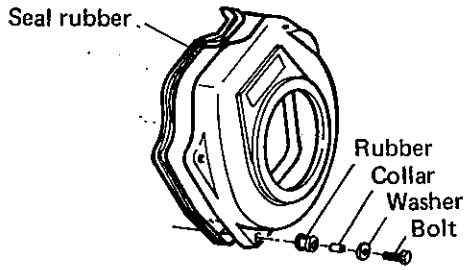


Fig. 2-23 Cooling fan case

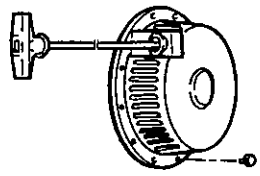


Fig. 2-24 Recoil starter

16. Air cleaner

1) Attach the air cleaner case.
2) Install the element.
3) Replace the cover.
   - Make sure the air cleaner packing s in position.

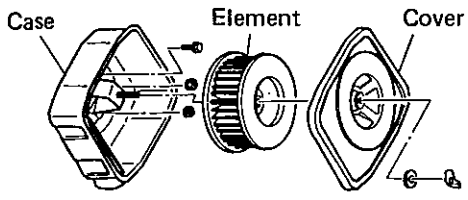


Fig. 2-25 Unassembled air cleaner

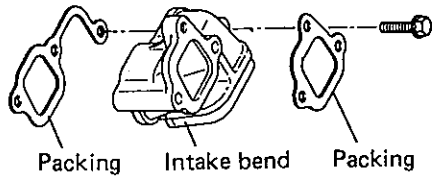


Fig. 2-26 Intake pipe

17. Starting motor

(Only for Model with starting motor)
Install the starting motor.

18. Exhaust silencer

Install the exhaust silencer.

- The silencer cover does not have to be removed.

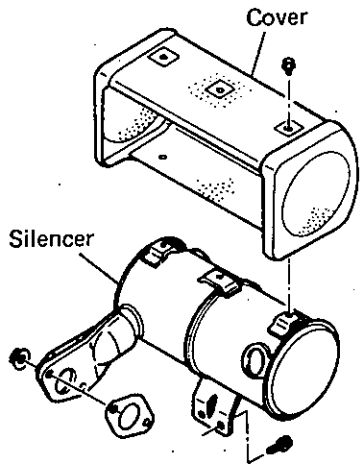
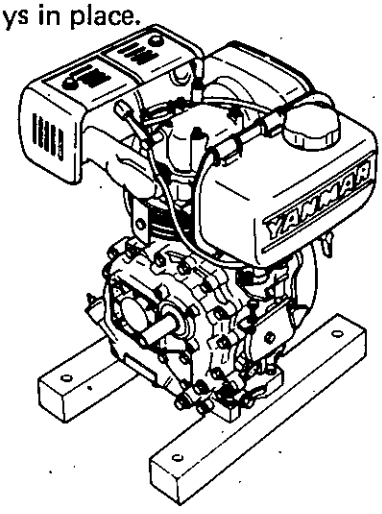


Fig. 2-27 Exhaust silencer

19. Fuel tank

1) Connect the fuel pipe to the fuel injection pump.
2) Attach the fuel tank using the upper stay.
3) Insert the fuel return pipe to the fuel tank.
   - Make sure the vibration absorbing rubber stays in place.



Piston ID mark

Model	Specification	Mark
—	S	G
	D	
1D75-1	S	S
	D	D
—	S	S
	D	D
1D84-1	S	S
	D	D

Note: S and D spec pistons are not interchangeable.

S spec.: Camshaft P.T.O.
D spec.: Crankshaft P.T.O.

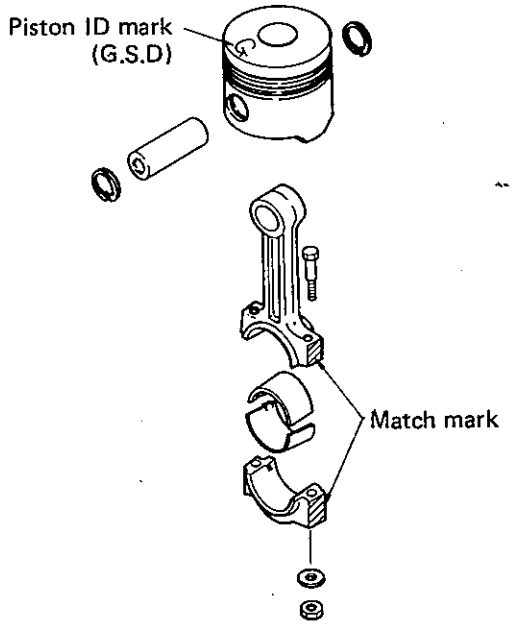


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Fig. 3-9 Piston and connecting rod

2) Fuel injection valve

(1) Specifications Model YDLLA-P

Item \ Specification	—	1D75-1	1D84-1
Mark to identify assembly ①	AB	AC	AF
Mark to identify nozzle valve and nozzle body ②	YANMAR 150P 224A1	YANMAR 150P 204B0	YANMAR 150P 224B0

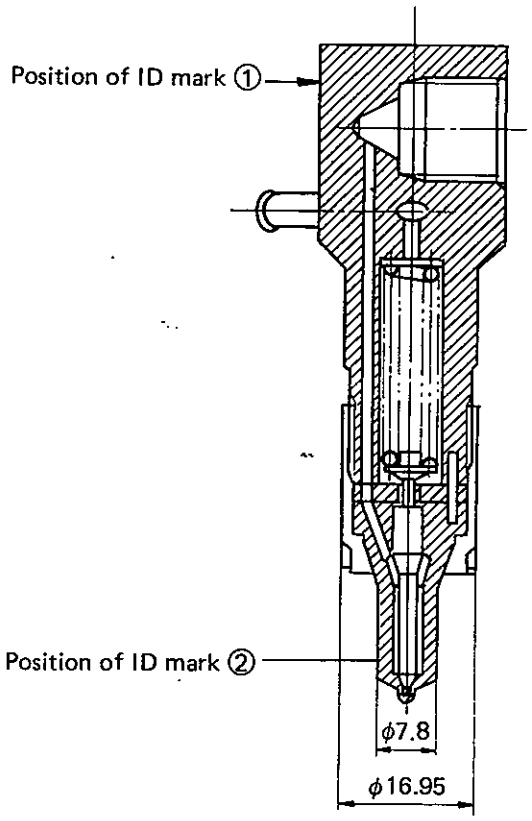

Fig. 3-20 Structure of injection valve

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[CAUTIONS]

1. When replacing fuel injection valve, be sure to check engine model against the identity marks shown above.
2. When removing the fuel injection valve, wrap it in cloth to protect the nozzle tip (injection port). Don't place the nozzle tip directly on the ground.

(2) Check

1) Carbon deposits
(Flowering)

Carbon deposits build up on the nozzle in the form of flowers. Flowering lowers combustion performance significantly. Make sure the nozzle is clean.

2) Shape of injection spray

Move the lever of the nozzle tester up and down slowly to check the spray.

Normal shape of spray

1. The spray should all be at the same angle.
(from all four injection ports)
2. The spray should be a fine mist.
3. The spray should be smooth and steady without deviations. (4 nozzles)

(3) Cautions when installing fuel injection valve

1) Tighten the fuel injection valve assy to the specified torque.
2) Clean the sleeve surface. Be sure to replace the nozzle gasket at the same time.

Note:
If nozzle gasket stays in cylinder head after injection valve assembly has been removed from cylinder head, screw M8 or M9 stud bolt (more than 100 mm long) in nozzle gasket, then pull out stud bolt to remove gasket.

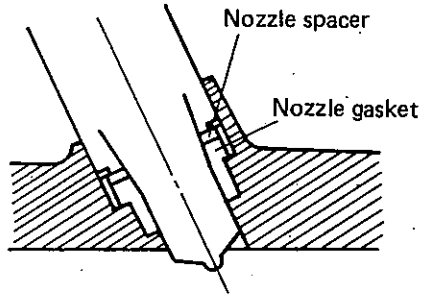

Fig. 3-21 Fuel injection nozzle

Tightening torque

kg-cm (lb-ft)

Installing fuel injection valve assy (2-M6 nuts)	80 – 100 (5.8 – 7.2)

Unit: mm (in)

Parts			Model	Standard	Service limit	Remarks
Crankshaft and Main bearing						
Pin part		Pin O.D.	—	φ29.965–29.982 (φ1.1797–1.1804)	29.90 (1.1772)	
			1D75-1	φ35.965–35.982 (φ1.4160–1.4166)	φ35.90 (φ1.4134)	
			1D84-1	φ39.965–39.982 (φ1.5734–1.5741)	φ39.90 (φ1.5709)	
		Oil clearance	1D75-1	0.025–0.055 (0.0010–0.0022)	0.12 (0.0047)	
			1D84-1	0.032–0.063 (0.0013–0.0025)		
Journal part	Plain bearing side	Journal O.D.	—	φ30.002–30.015 (φ1.1812–1.1817)	φ29.91 (φ1.1776)	
			1D75-1	φ35.002–35.018 (φ13780–1.3787)	φ34.91 (φ1.3744)	
			1D84-1	φ40.002–40.018) (φ1.5749–1.5755)	φ39.91 (φ1.5713)	
		Bearing I.D. (Plain)	—	φ30.015–30.078 (φ1.1817–1.1842)	φ30.13 (φ1.1862)	
			1D75-1	φ35.009–35.078 (φ1.3783–1.3810)	φ35.13 (φ1.3831)	
			1D84-1	φ40.009–40.078 (φ1.5752–1.5779)	φ40.13 (φ1.5799)	
		Oil clearance	—	0.03–0.08 (0.0012–0.0031)	0.17 (0.0067)	
			1D75-1 1D84-1	0.027–0.079) (0.0011–0.0031)		
	Ball bearing side	Journal O.D.	—	φ30.002–30.015 (φ1.1812–1.1817)	—	
			1D75-1	φ35.007–35.018 (φ1.3780–1.3787)	—	
			1D84-1	φ40.007–40.018 (φ1.5749–1.5755)	—	

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