TECHNICAL SPECIFICATIONS

DIESEL ENGINE	
Model	YANMAR 3TNE74
Type	vertical, 4-cycles, Swirl chamber, water cooled
Net power at flywheel at 2000 rpm^{-1} (ISO9249)	11 kW
Number of cylinders	3 in-line
Bore x Stroke	74 mm x 78 mm
Total displacement	1.006 L
ELECTRICAL SYSTEM	
Voltage of operation	12 V
Batteries (capacity 20 h)	45 Ah
Alternator (current)	20 A
Starter motor (Power)	1 kW
HYDRAULIC COMPONENTS	
Pump	with axial pistons, with variable displacement + gear pump
Slew motor	orbit at fixed displacement
Travel motor	with axial pistons, variable volume for 2 speeds
Control valve	10-spool multiple
Cylinders boom, arm, bucket, swing, dozer, crawler width	double action
SPEED AND PERFORMANCE ON GRADIENTS	
Crawlers	rubber / steel
Slewing speed	9.0 rpm^{-1}
Travel speed	
slow	2.0 km/h
fast	3.5 km/h
Maximum climbable gradient	58%
SWINGING	
Type	swinging with cylinder
Swinging angle	
Right side	50°
Left side	85°

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STANDARD WORKING TIME TABLE FOR THE MAINTENANCE OF EXCAVATOR

Standard maintenance time table
- Units of working time : 6 minutes = 0.1 hour
- Calculating method of standard maintenance time:
  Maintenance time = Working time X Number of workers
  (Working time = Maintenance time / Number of workers)

- When more than one work are done,
  - Add each standard maintenance time
  - A net time (readily starting) is given except covers easily removed by hand.
  - Assy works include the following works marked with black dot.

- O/H : The removing and installing time are not included.

- Abbreviations in the table.

ASSY:	Assembly
ATT:	Attachment
BRG:	Bearing
C/V:	Control valve
Cyl:	Cylinder
E/G:	Engine
F hose:	Flexible hose
Inst.:	Installation
O/H:	Overhaul
SW:	Switch
SOL:	Solenoid
V:	Valve

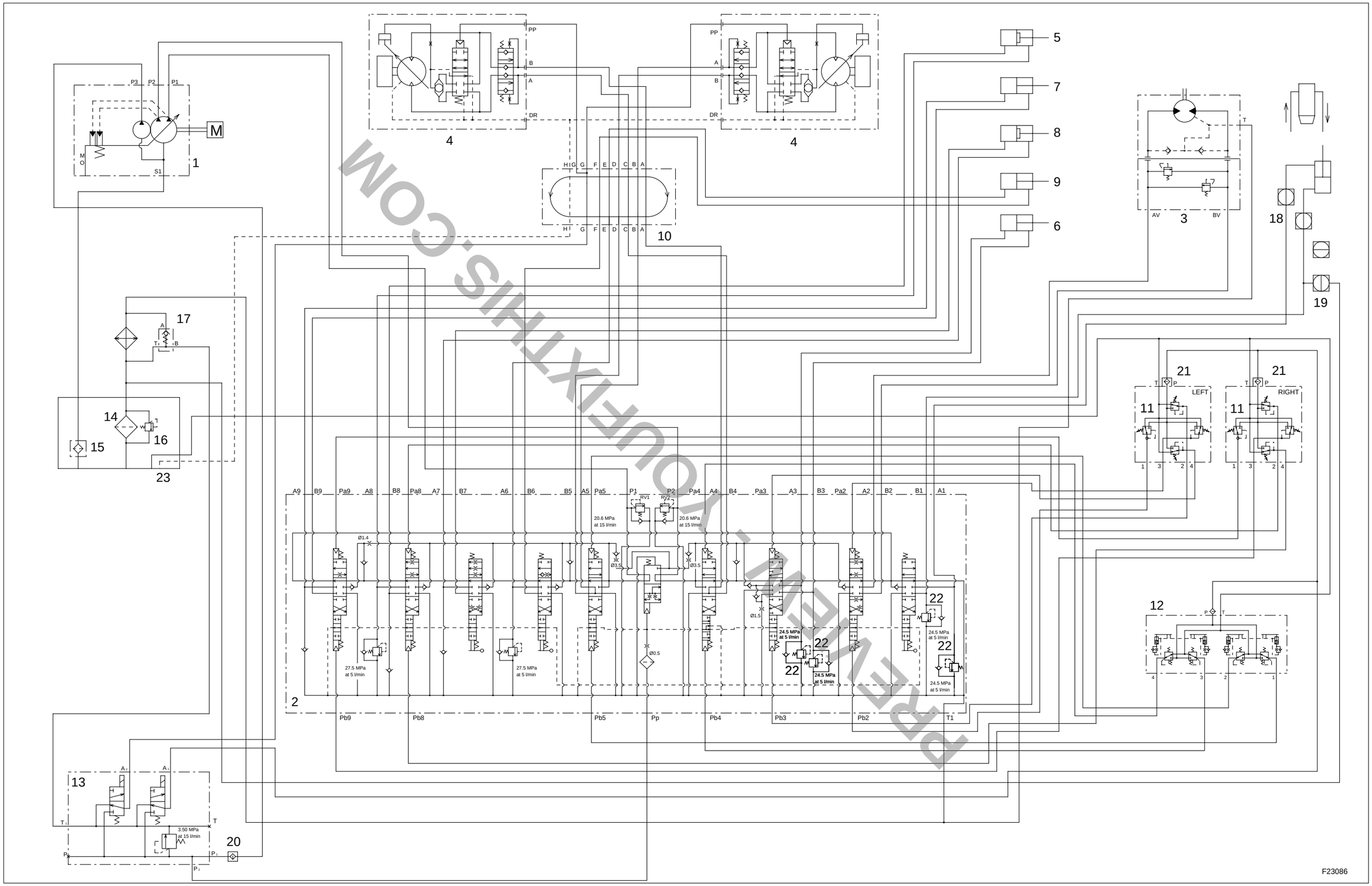
GROUP No.		EQUIPMENT PORTION	WORK TO BE DONE	UNIT	REMARK	UNIT : HOUR
Attachment	00	Bucket portion			See section n°10	
	01	Bucket ASSY	Removal/Inst.	1 pc.	Include adjustment	0.4
	02	• Bucket removing/ installing position	Preparation	1 pc.		0.1
	03	• Bucket installing pin	Removal/Inst.	1 pc.	Include stopper pin.	0.1
	04	• Bucket drive pin	- ditto -	1 pc.		0.1
	05	• Bucket sling and transfer	Preparation	1 pc.		0.1
	06	Bucket (Single)	O/H	1 pc.	Not include removing and installing	0.6
	07	• Bushing	Replace	1 pc.		0.5
	10	Arm portion			See section n°10	
	11	Arm ASSY	Removal/Inst.	1 pc.		0.8
	12	• Bucket cylinder removing/ installing position and piping	Preparation	1 pc.		0.2
	13	• Bucket cylinder rod pin	Removal/Inst.	1 pc.	Include stopper pin.	0.1
	14	• Bucket cylinder head pin	- ditto -	1 pc.	Include stopper pin.	0.1
	15	• Bucket cylinder assy	- ditto -	1 pc.		0.1
	16	• Arm cylinder rod pin	- ditto -	1 pc.	Include stopper pin.	0.1
	17	• Boom top pin	- ditto -	1 pc.		0.1
	18	• Arm sling and transfer	- ditto -	1 pc.		0.1
	20	Boom portion			See section n°10	
	21	Boom ASSY	Removal/Inst.	1 pc.		1.0
	22	• Boom removing/ installing position	Preparation	1 pc.		0.1
	23	• Boom cylinder temporary slinging	- ditto -	1 pc.		0.1
	24	• Boom cylinder rod pin	Removal/Inst.	1 pc.	Include stopper pin.	0.1
	25	• Boom cylinder piping	- ditto -	1 pc.		0.1
	26	• Arm & Bucket piping	- ditto -	1 pc.		0.2

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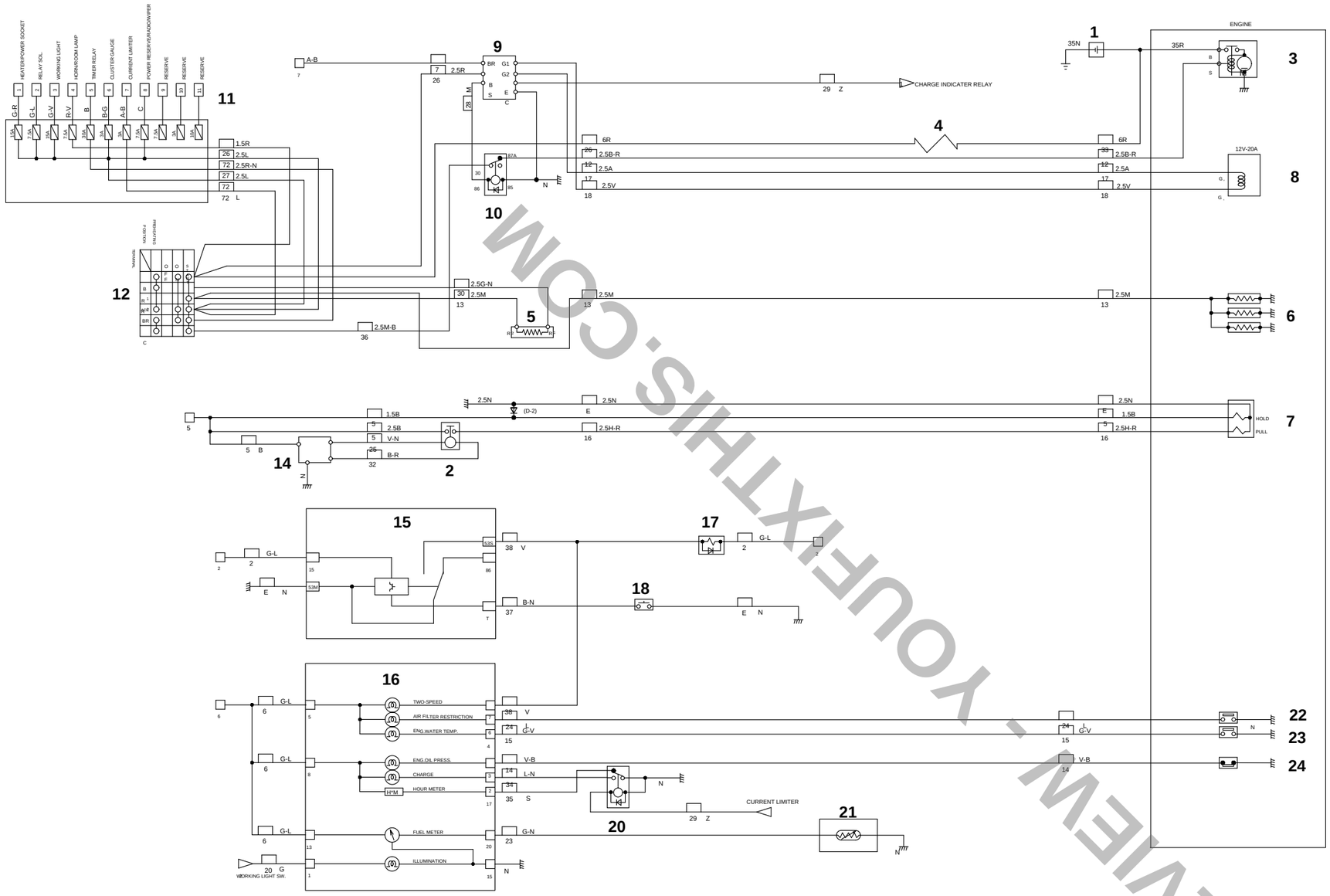
HYDRAULIC CIRCUIT (RIGID CRAWLER FRAME)

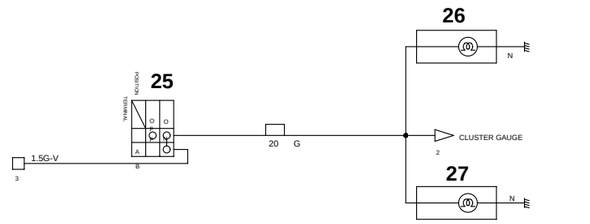


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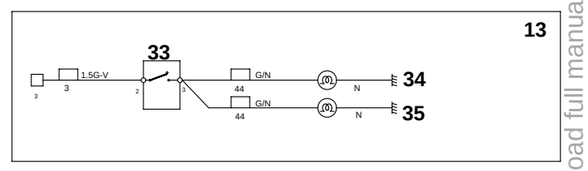
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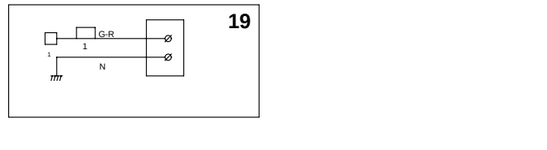


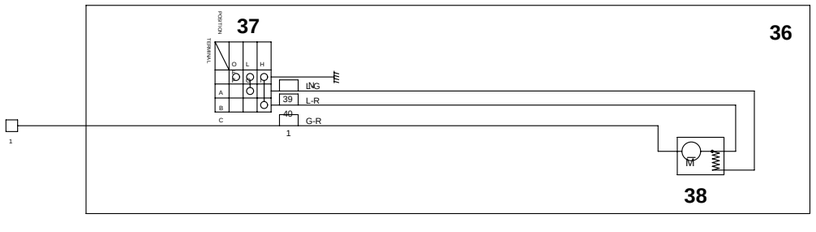


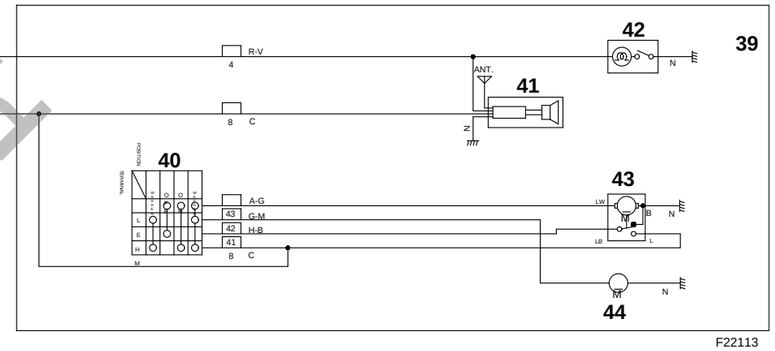












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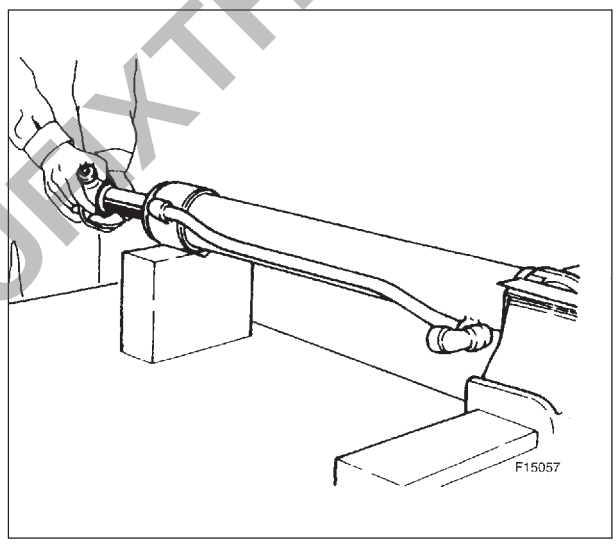
DISASSEMBLY AND ASSEMBLY

GENERAL PRECAUTIONS

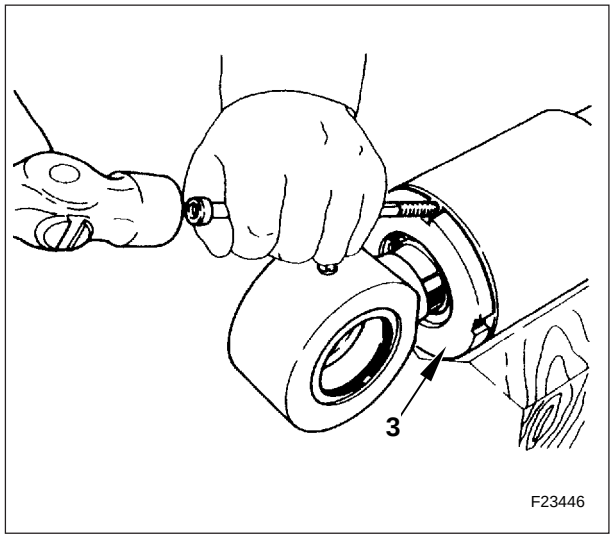
- Carry out the disassembly and assembly works in a clean work shop, and always keep disassembled parts at clean conditions.
- Prior to disassembly, thoroughly clean the cylinder externally.
- Use caution not to give any damages to the parts while carrying out the disassembly / assembly works.
- Thinly apply grease or hydraulic oil to seals prior to installation.
- After the installation of O-ring, confirm there is no twist on it.
- Apply clean hydraulic oil to each sliding portion before the installation.
- Confirm each sliding portion for no burr and defect, and its smooth sliding operation.
- This manual describes mainly for the swing cylinder as an typical example.

DISASSEMBLY

1. Disassembly of cylinder assy
Fix the clevis portion of tube with a vice, and hold the other end with a wooden stand to hold the cylinder in level.
Drain hydraulic oil remained in the cylinder.
- Slowly move the piston rod so that the hydraulic oil does not spout out.



2. Make straight the locking fin for the cylinder head (**3**).
- Use cautions bending / straightening of locking fin, because locking fin and cylinder tube are made with one-piece.



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GENERAL PRECAUTIONS

Troubleshooting provides the process to investigate the cause of trouble in order when a trouble occurred. This manual describes the way how to solve the specific phenomenon systematically as quick as possible. For the troubleshooting concerning the inside of equipment, refer to the troubleshooting for each manual of the equipment.

CONFIRM ACTUAL TROUBLED CONDITIONS AT SITE

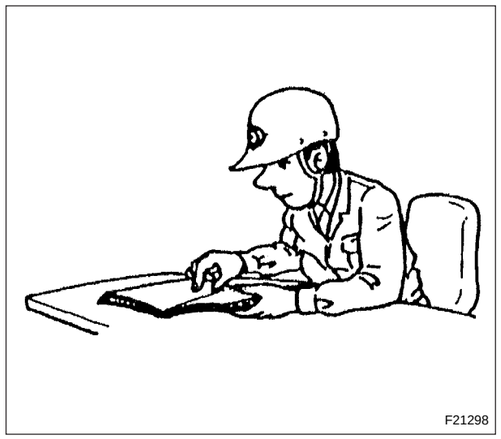
1. Get to the site as quickly as possible:
Verify the machine model, serial number, situation of trouble and field, and notify possible arrival time to the user.

2. Verify background of trouble occurred:
- Model name and serial number.
- Kind of attachment.
  Check that the combination of attachments was proper and that the operating manner was not unreasonable.
- Operating time on the hour-meter.
- Record of troubles.
  First trouble or repeated trouble.
- History of the trouble and additional modifications.
  Reoccurrence of the same trouble in the past or trouble due to additional modification.

3. How to diagnose trouble:
- Verify defective part.
- Reproduce the troubled conditions.
- Where the defective part can not be verified, surmise the possible causes systematically.
- Verify the surmised cause.
- Report estimated repairing method, procedures and term to the user.

4. Explanation of the cause of trouble:
- Explain the cause of trouble to the user.
  For example, explain the oil leakage through the piston is caused by defect on the piston rod. And the proper operating manner of the machine should be explained to the user to prevent reoccurrence of the same kind of trouble.
- Handling of damaged parts
  The damaged parts to be claimed and returned are the evidence, so they should be handled with care. For example, protect them from invasion of water, soil, etc., into ports on a hydraulic equipment, etc., at the returning them. And also use care not to give any damages and breakage for transport.


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SAFETY PRECAUTIONS

GENERALITIES

Read the Operation and Maintenance Instruction Manual carefully before starting, operating, maintaining, fuelling or servicing the machine.
Carefully read the explanation to each and all safety signs in the special section of this Manual before starting, operating, maintaining, fuelling or servicing the machine.
Machine-mounted safety plates are colour coded yellow with black borders when they refer to points where special **WARNING** must be paid and failure to observe them may cause a serious **DANGER** to the integrity of machine operators.
They are white with red borders and black lettering when they refer to a **FORBIDDEN** practice.
It is fundamental that all machine operators know very well the meaning of each safety plate as this considerably decreases operating hazards and accidents.
Do not allow unauthorised personnel to operate or service this machine.
Do not wear rings, wrist watches, jewellery, loose or hanging garments, such as ties, torn clothing, scarves, unbuttoned or unzipped jackets that can get caught in moving parts.
Wear certified safety clothes such as: hard hat, no-slip footwear, heavy gloves, ear protection, safety glasses , reflector vests, respirators every time the job requires it.
Ask your employer about safety regulations in force and protective equipment.
Always keep the operator's compartment, step plates, grab-rails and handles clean and clear of foreign objects, oil, grease, mud or snow to minimise the danger of slipping or stumbling.
Remove mud or grease from your shoes before operating the machine.
Do not jump on or off the machine. Always keep both hands and one foot, or both feet and one hand in contact with steps and/or grab rails.
Do not use controls or hoses as hand holds.
Hoses and controls are movable parts and do not provide solid support.
Besides, controls may be inadvertently moved and cause unexpected movement of the machine or its attachments.
Never operate the machine or its attachments from any position other than sitting in the driver's seat.
Keep head, body, limbs, hands and feet inside the operator's compartment at all times to reduce exposure to external hazards.
Be careful of possible slippery conditions of the steps and hand rails as well as of the ground around the machine.
Wear protective boots or shoes with the soles made of highly no-slip rubber.
Do not leave the machine until it has come to a complete stop.
Always check height, width and weight limitations which may be encountered in the working site and ensure the machine does not exceed them.
Assess exact paths of gas ducts, water mains, telephone lines, sewers, overhead and underground electric lines and all other possible obstacles.
Such paths should be opportunely defined by competent Authorities.
If necessary, require that the service is interrupted or said installations are moved prior to starting the work.
You must know the working capacity of the machine.
Define the rear upper structure swing area and provide for opportune barriers to prevent access into it.
Never exceed machine lifting capacity.
Remain within the limits shown in the loading capacity chart located on the machine.

STARTING

Never start or operate a failed machine. Walk all around the machine before mounting.
Before operating the machine, make sure that any possible dangerous condition has been properly removed.
Before starting machine, check that steering and attachment controls are in the neutral position and the safety lever is in the LOCK position.
Immediately report any malfunction of parts or systems to the maintenance managers for proper action.
Prior to starting the engine, check, adjust and lock the driver's seat for maximum riding comfort and control accessibility.
Prior to operating the machine and/or its attachments, check that bystanders are outside the machine operating range. Sound the horn.
Obey all hand signals, safety indications and signs.

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AVOID ACCIDENTS

Most accidents, whether they occur in industry, on the farm, at home or on the highway, are caused by the failure of some individuals to follow simple and fundamental safety rules or precautions. For this reason MOST ACCIDENTS CAN BE PREVENTED by recognising the real cause and doing something about it before the accident occurs.
Regardless of the care used in the design and construction of any type of equipment there are conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.
Carefully read indications, cautions and safety warning quoted in the "SAFETY RULES" section.
A careful operator is the best insurance against an accident.
The complete observance of one simple rule would prevent many thousand serious injuries each year.
That rule is:
Never attempt to clean, oil or adjust a machine while it is in motion.

ATTENTION

On machines having hydraulically, mechanically and/or cable controlled equipment (such as showels, loaders, dozers, scrapers etc.) be certain the equipment is lowered to the ground before servicing, adjusting and/or repairing.
If it is necessary to have the equipment partially or fully raised to gain access to certain items, be sure the equipment is suitably supported by means other than the hydraulic lift cylinders, cable and/or mechanical device used for controlling the equipment.

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SAFETY PRECAUTIONS

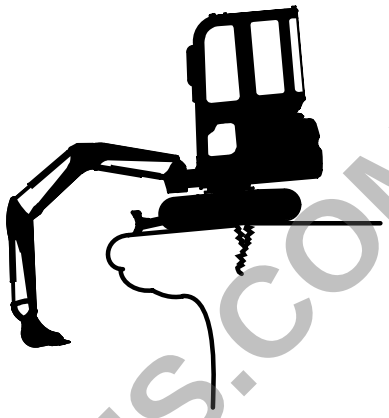
AVOID UNDERCUTTING

Never undercut or the footing might collapse.

Before starting to work, make sure of the excavator control direction.

If the footing starts to collapse and if sufficient retreat is not possible, do not panic.

Often, the machine can be secured by lowering the front attachment.

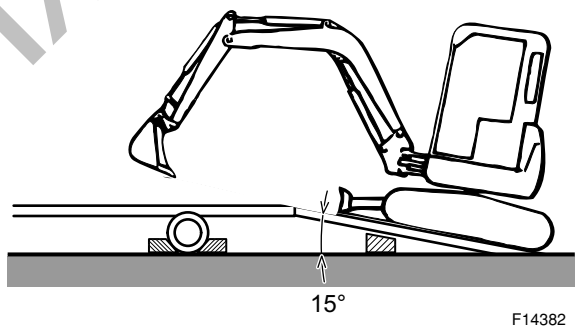


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SAFETY TRANSPORTING

The danger of tipping is present when loading/unloading the machine onto/from a truck or trailer bed.

- Be sure to observe local regulations when transporting the machine on public roads.
- Provide an appropriate truck or trailer for transporting the machine.

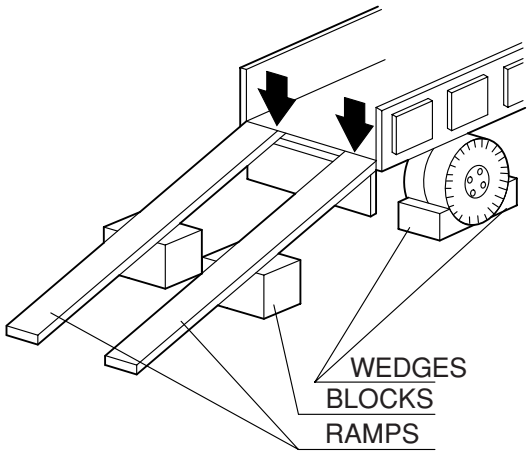


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Take the following precautions when loading/unloading the machine:

- Select firm level ground.
- Be sure to use a loading dock or ramp.
- Be sure to have a signal person when loading/unloading the machine.
- Always turn the auto-idle (A/I) switch off when loading or unloading the machine, to avoid unexpected speed increase due to unintentional operation of a control lever.
- Always select the slow speed mode with the travel speed selector.

In the high speed mode, travel speed may automatically increase.

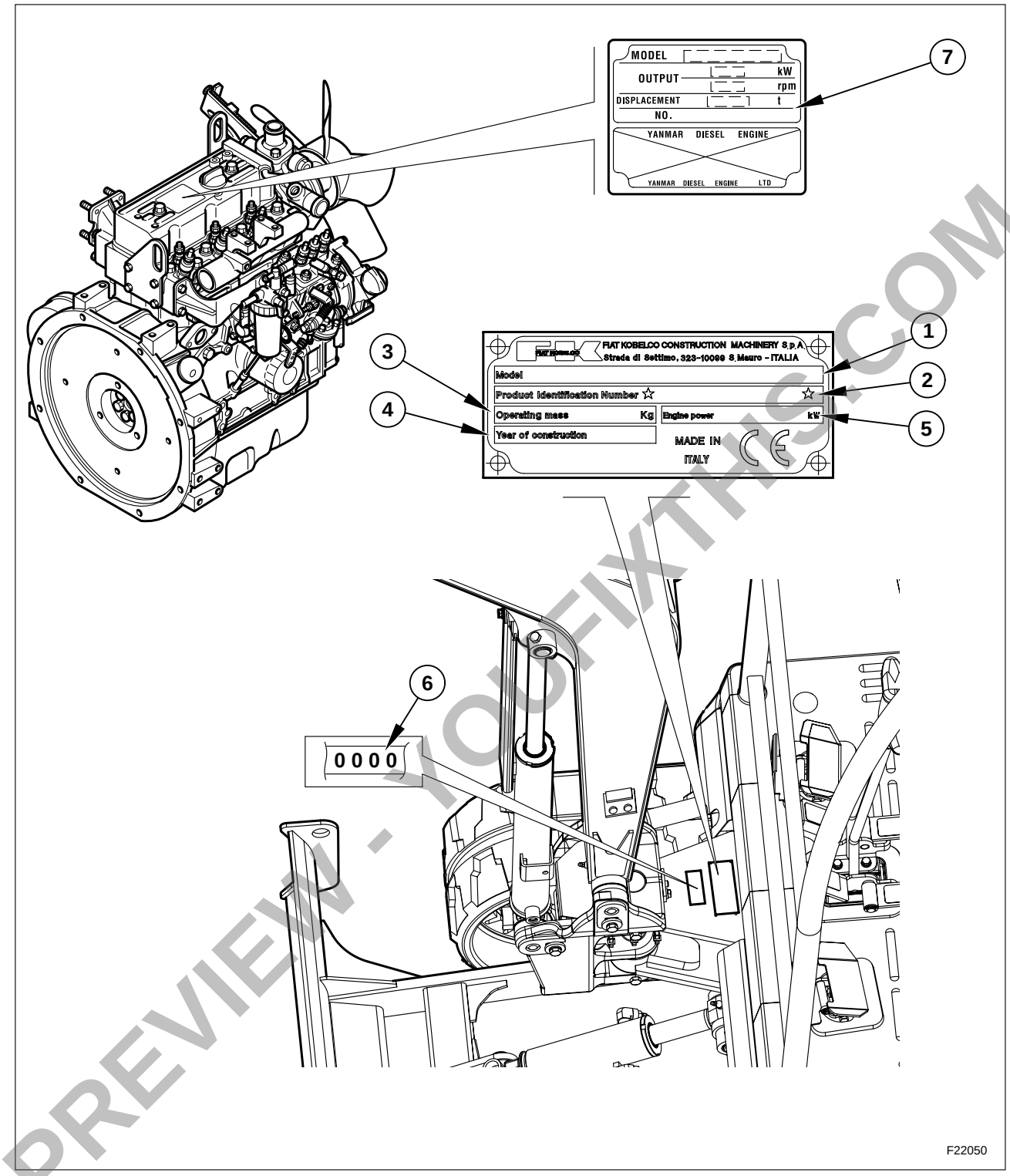


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IDENTIFICATION DATA



EXCAVATOR MARKING PLATES

1. Machine technical type
2. Frame identification number
3. Machine total mass
4. Machine manufacturing year
5. Engine power in kW
6. Frame identification number
7. Identification decal: diesel engine type and serial number

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Pilot Circuit Pressure

- Measuring Conditions

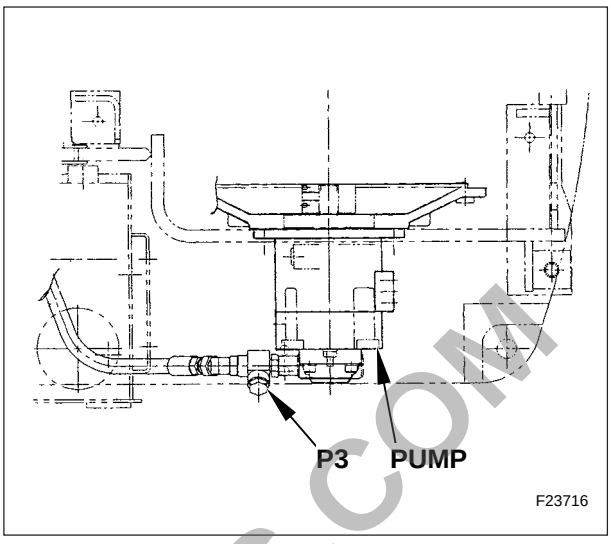
  Engine: High idling
  Hydraulic oil temp.: 50 ~ 60 °C
  Coolant temp.: 60 ~ 90 °C
  at radiator surface

- Measurement

  Setting a pressure gauge to the pressure detecting port (plugged), measure the pilot relief pressure.

Pressure Detecting Port		Relief Valve
Port Location	Size	
P3	PF1/4	PR

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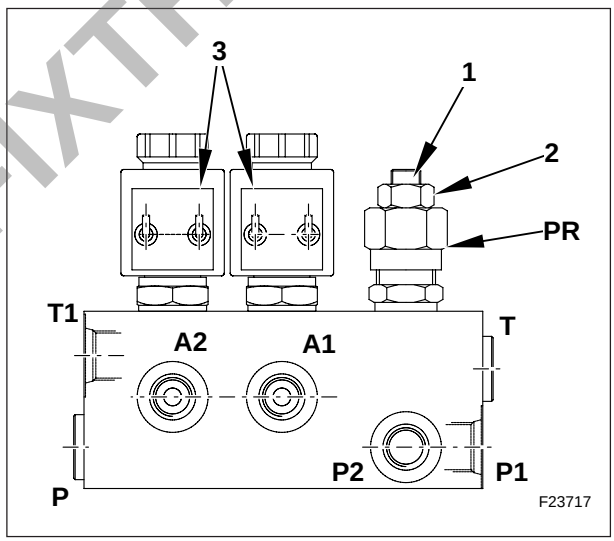
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- Pressure Adjustment

  Adjust it with the relief valve attached to the solenoid valve.

  - Loosen the lock nut (**2**), then turn the setscrew (**1**) to adjust the set pressure.
    CW screwing: Set pressure is increased.
    CCW screwing: Set pressure is decreased.
  - After the adjustment, lock the setscrew with the lock nut holding the setscrew not to allow its turning.
  - Again actuate the relief valve, and verify that the set pressure is being stable.

  Tightening Torque
  Relief valve (**PR**): 46 ÷ 51 Nm
  Solenoid Valve(**3**): 39 ÷ 51 Nm
  Set pressure relief valve: 3.5 Mpa (35 bar) at 15 l/min



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SWING OPERATING CIRCUIT

The operation is conducted by the operating pedal, which drives the cable to operate valve.

SWING RIGHT OPERATING CIRCUIT

Swing Operation

By means of stepping down the swing (right) operating pedal, the swing valve spool in control valve (**2**) is shifted through the pulling up motion of the cable. Since the pilot oil pressure is not utilized for it, as the same case as the dozer, it is activated regardless to the safety lock lever.

Main Circuit

- Supply Circuit for Cylinder (**8**)

  The discharged oil from P1 port on variable pump enters into P1 port on control valve (**2**), and is divided into 2 directions through travel straight valve and travel right valve. One is discharged from A7 port through swing valve and supplied to the rod side of cylinder (**8**) to activate the swing motion (right).

  The other enters into swing valve through dozer valve, and part of appropriate volume of oil is returned to the tank due to the throttle effect on the swing valve to restrict the volume of oil to be supplied to the swing cylinder. Then the speed difference, due to difference of pressure receiving area, is lost between head side and rod side of the cylinder, resulting stable swing motion at the similar for both swings for leftward and rightward.

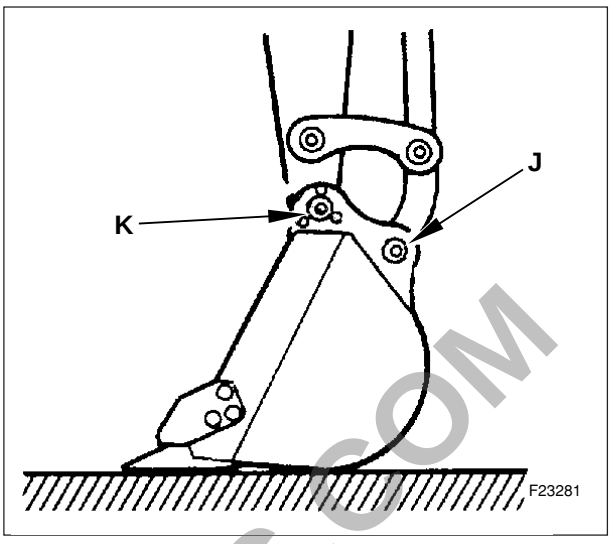
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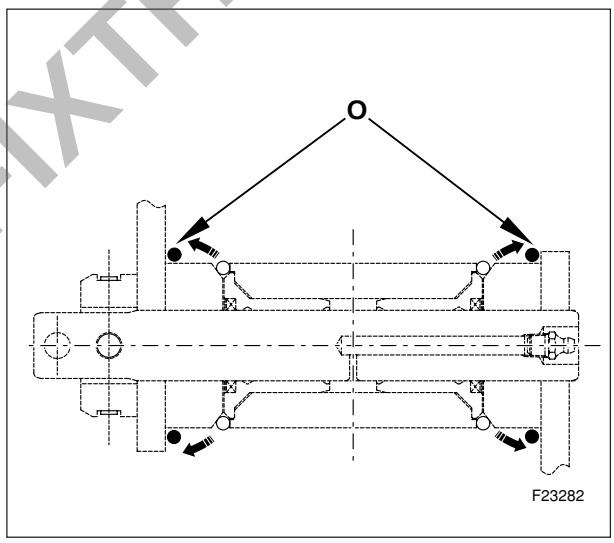
REMOVAL OF BUCKET

1. Operate the operating lever and place the bucket on the ground, so the bucket and arm connecting pins are not loaded.

K = Pin for arm
J = Pin for bucket link

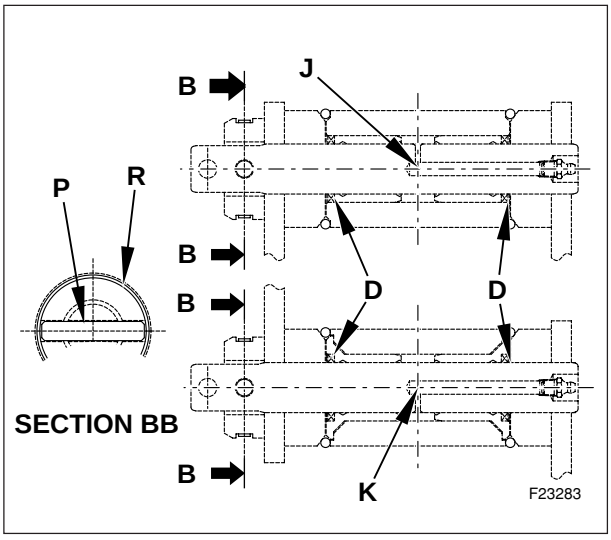


2. Move the O-rings (**O**) toward the bucket bosses using a spatula.



3. In order to remove pin (**K**) which links arm and bucket, remove the ring (**R**) and the pin (**P**) by means of minus driver, and draw out pin (**K**).
- If the pin does not come off easily, the pin is loaded. Take off the load by manipulating the operating lever.
- Take care so the dust seal (**D**) between the arm and the bucket bosses is not damaged.

Adjust the bucket by manipulating the operating lever so the pin (**J**) between the bucket link and the bucket is not loaded.
Remove the ring (**R**) and pin (**P**) then pull out the pin (**J**).



4. Remove bucket assy (for the weights look the table).

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MAINTENANCE STANDARDS

INSPECTION AFTER DISASSEMBLY

PARTS NAME	INSPECTING PORTION	INSPECTION ITEM	REMEDY
Piston rod	1. Neck of rod	Presence of crack	Replace
	2. Stepped part to which piston is attached	Presence of crack	Replace
	3. Threads	Presence of seizure, etc.	Recondition or replace
	4. Bend	Measure amount of bend	Refer to Rod Bend
	5. Plated surface	1) Wearing off of plating 2) Rust on plating 3) Presence of defect	1. Replace 2. Replace 3. Recondition or replace
	6. Rod	Wear of outside	Recondition or replace
	7. Bushing at mounting part	Wear of inside	Replace
Cylinder tube	1. Welded part of bottom	Presence of crack	Replace
	2. Tube at mounting part	Presence of crack	Replace
	3. Tube inside	Presence of defect	Replace if oil leak is seen
	4. Bushing at mounting part	Wear of inside	Replace
Rod cover	1. Bushing	1) Wear of inside 2) Defect of inside	Replace

REPAIR PROCEDURE

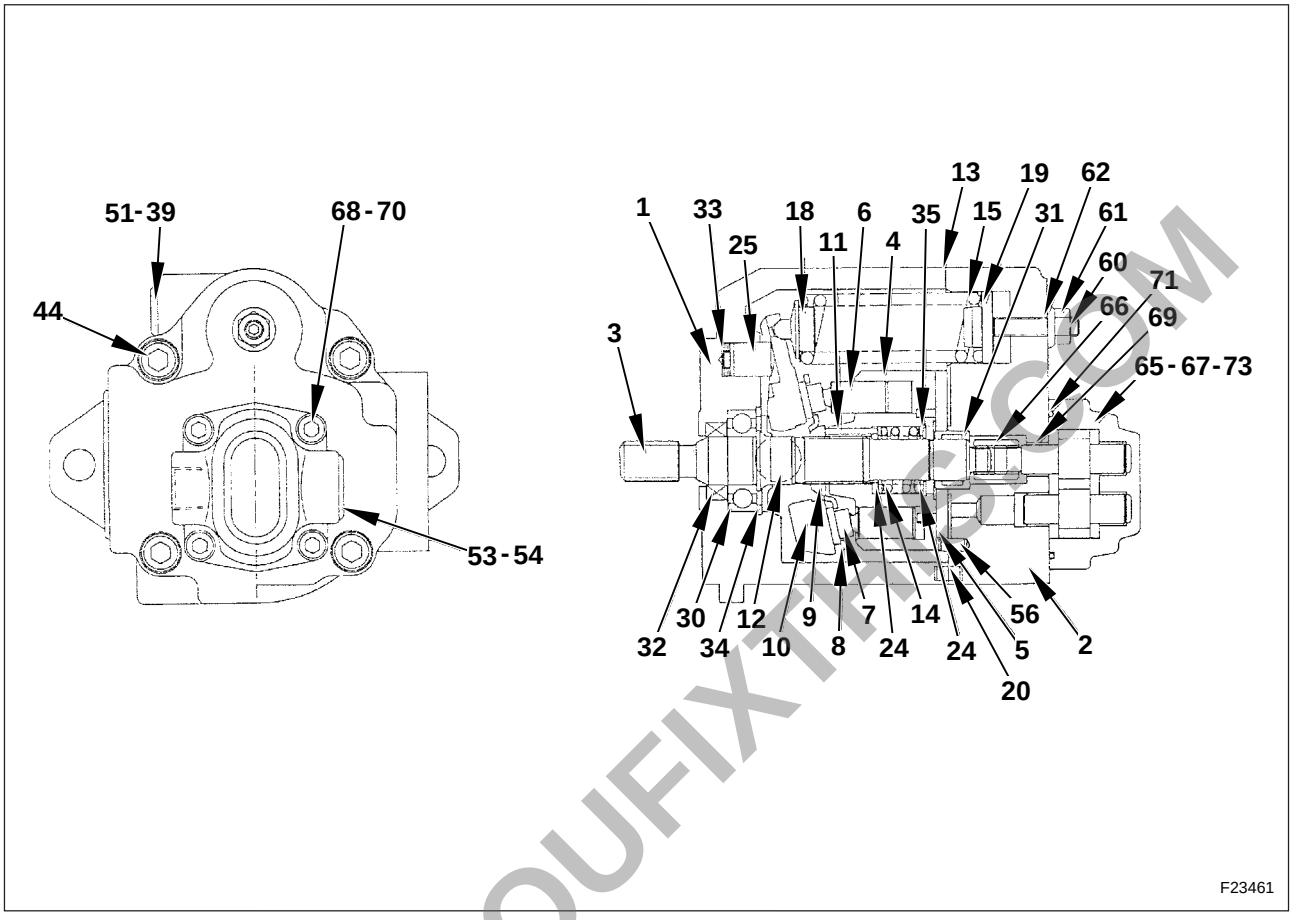
Replace sliding parts and seal parts according to the followings.

Bushing ..... where 1/4 of circumference is worn in copper color.
Seals and slide rings ..... replace them when cylinder is disassembled.
Pin bushing ..... where severe scuffing is appeared.
Piston rod ..... where the bent 0.5 mm/m or more is appeared.

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COMPONENTS



No.	NAME	Q'TY	No.	NAME	Q'TY	No.	NAME	Q'TY
1	BODY S	1	18	SPRING HOLDER	1	54	O-RING	1
2	BODY H	1	19	SPRING GUIDE	1	56	SPRING PIN	1
3	SHAFT	1	20	PIN	2	60	SETSCREW	1
4	CYLINDER BARREL	1	24	RETAINER	2	61	NUT	1
5	VALVE PLATE	1	25	STOPPER PIN A	1	62	SEAL WASHER	1
6	PISTON	10	30	BALL BEARING	1	65	GEAR PUMP KIT	1
7	SHOE	10	31	NEEDLE BEARING	1	66	JOINT	1
8	SHOE HOLDER	1	32	OIL SEAL	1	67	STEEL BALL	2
9	BARREL HOLDER	1	33	CONED DISK SPRING	4	68	SOCKET BOLT	4
10	SWASH PLATE	1	34	SNAP RING	1	69	BUSHING	2
11	NEEDLE	3	35	SNAP RING	1	70	WASHER	4
12	OSCILLATING PIN	2	39	O-RING	1	71	O-RING	1
13	PACKING	1	44	SOCKET BOLT	4	73	GASKET	2
14	SPRING C	1	51	PLUG	1			
15	SPRING T	1	53	PLUG	1			

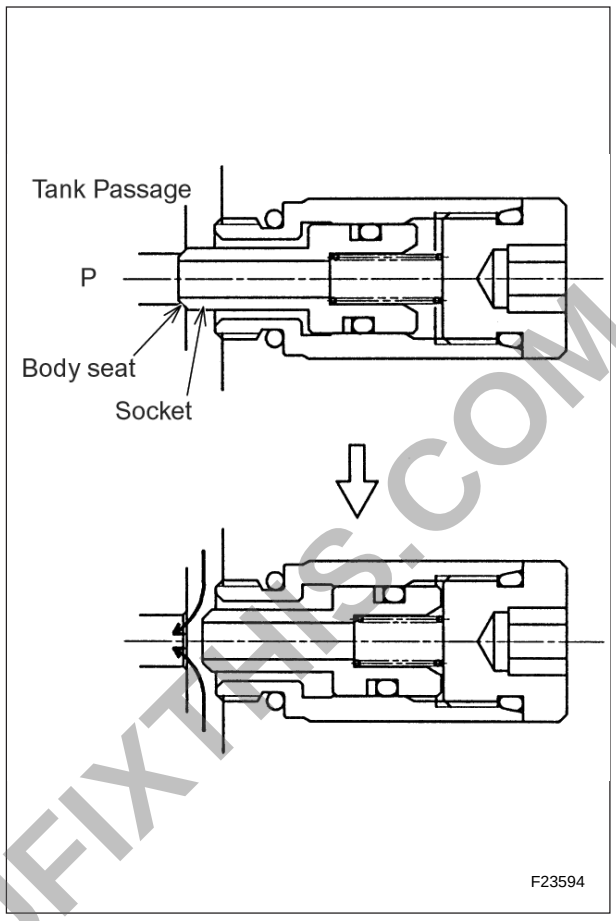
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OPERATION OF ANTI-CAVITATION VALVE

When the negative pressure is generated in the (**P**) port, the oil is supplied through the tank circuit. When the pressure from the (**P**) port rises, the valve is pushed up.
Consequently, the space between the body seat and the socket opens, and the oil flows from the tank circuit into the (**P**) port and the space fills with the oil.



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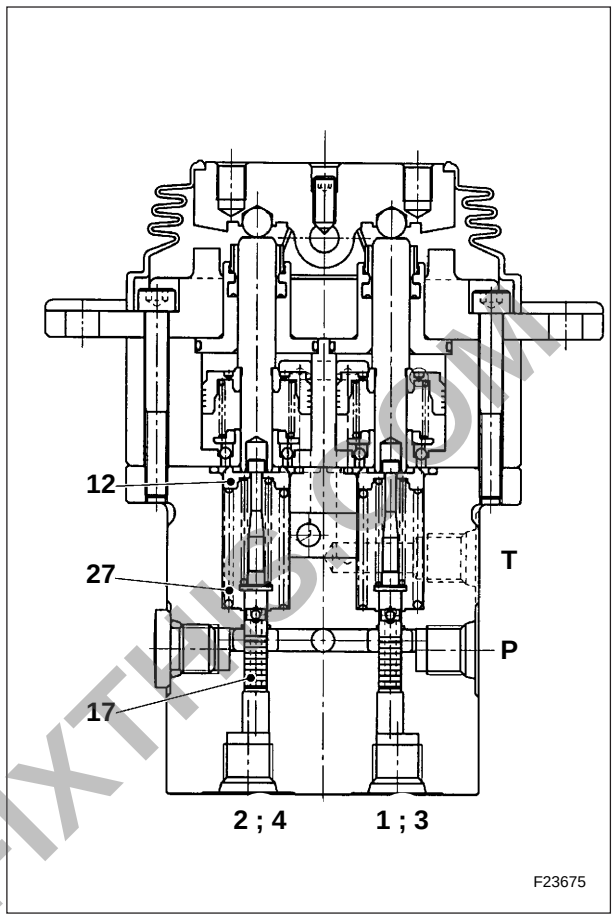
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OPERATION

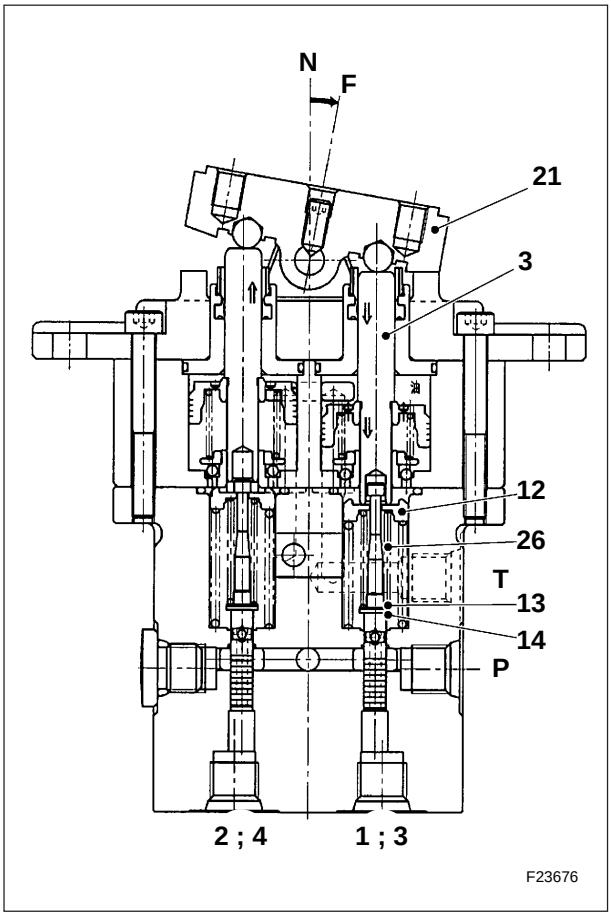
Pressure reducing valve portion

- When lever is in neutral position:
  The spool (**17**) is pushed up by the return spring (**27**) through the spring seat (**12**) and located in the neutral position as shown in the right Figure. Therefore the pressures at the output port 1 and 2 become identical to the one at the port T because the output port is connected only to the port T by shifting the spool position.



- When lever inclined:
  When the cam (**21**) is rotated clockwise, the push rod (**3**) of the port 1 side is pushed downward, the spool moves downward through the spring seat (**12**), the second pressure setting spring (**26**), the shim (**13**) and the washer (**14**), the port P is connected to the port 1, and hydraulic oil supplied by the pilot pump flows to the port 1 to generate the pressure.
  When the pressure increases to the value corresponding to the secondary pressure setting spring adjusted by inclining the lever, the hydraulic pressure acting to the spool balances with that spring force to keep the output pressure at the port 1 constant.
  The spool of the port 2 side keeps the neutral condition, and the return oil from the control valve is discharged through the port T.

N. Neutral position
F. Full stroke

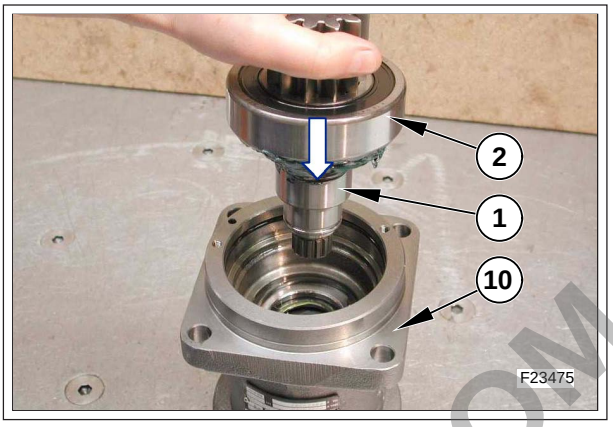


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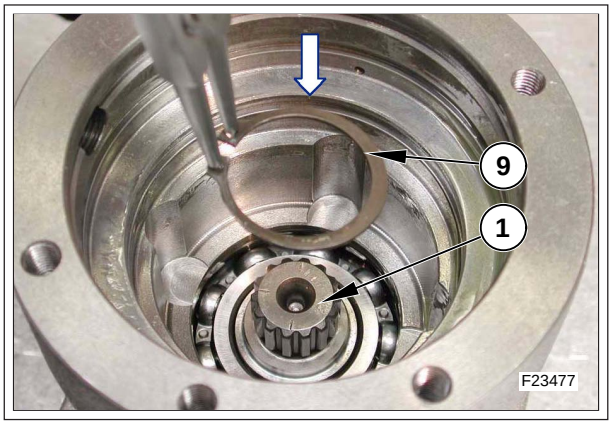
41. Assemble the pinion shaft (**1**) and the bearing (**2**) in the gearbox housing (**10**).



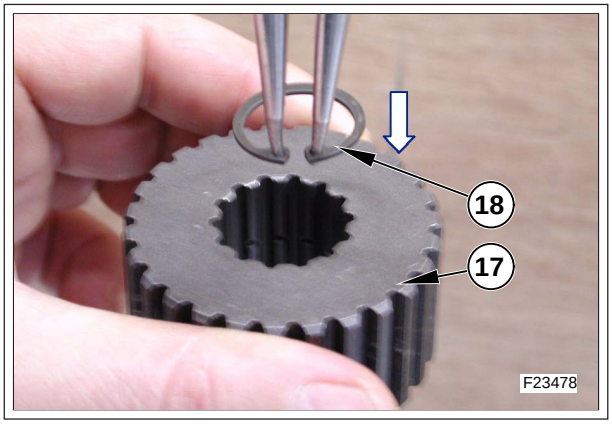
42. By using a press and a tool assemble the output unit.



43. Turn the gearbox upside down and by using pliers assemble the circlip (**9**) into its seat in the pinion shaft (**1**).



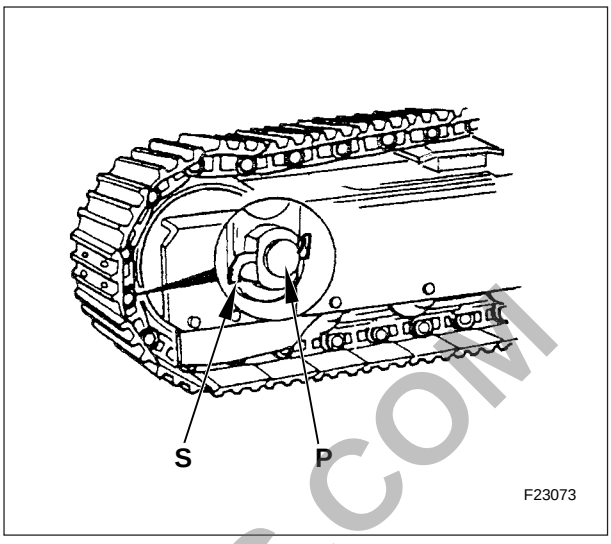
44. By using pliers, assemble the circlip (**18**) into its seat in the brake shaft (**17**).



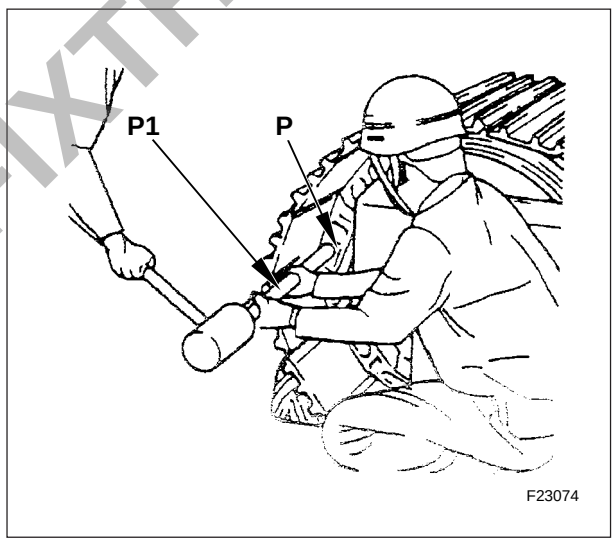
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4. Straighten the curve of lock pin (**S**), and draw out it striking by hammer.



5. Apply master pin drawing out jig (**P1**) to the small diameter section of master pin (**P**), and draw it out striking by hammer.



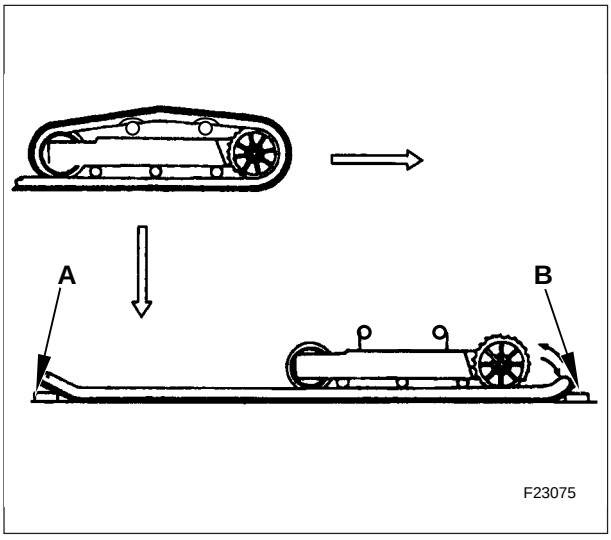
WARNING

- *Especially Pay attention to the front idler which may spring out due to the force of spring when drawing out master pin o repair broken parts relating to the front idler.*
- *Be careful not to be injured by scattering materials when large hammer is used.*
- *Don't be close to the machine because the end of the crawler may drop just before extending the track link assy to the ground while rotating the sprocket. Put square timber just in case.*

6. Move the machine back slowly, and remove the crawler extending it to the ground.

WARNING

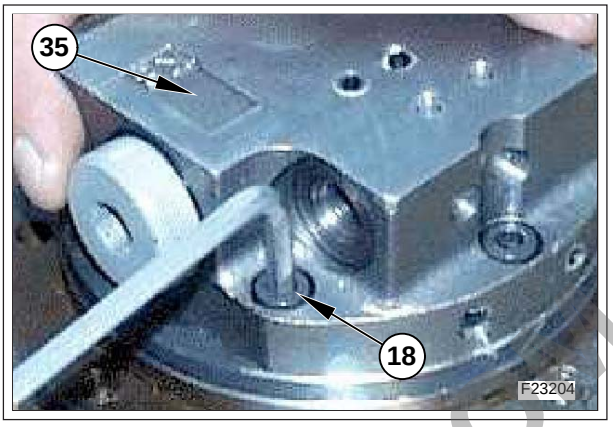
Weight of iron crawler (one side): 88 kg.



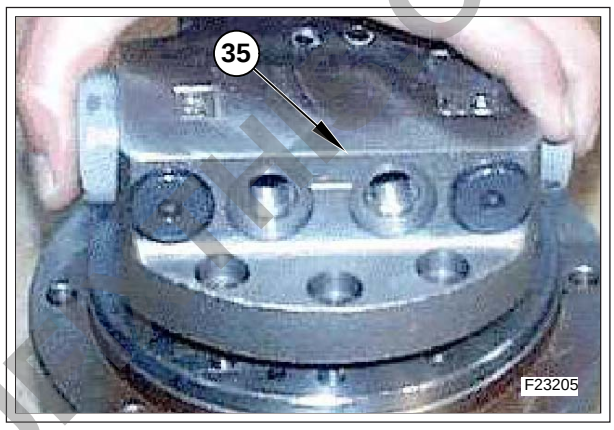
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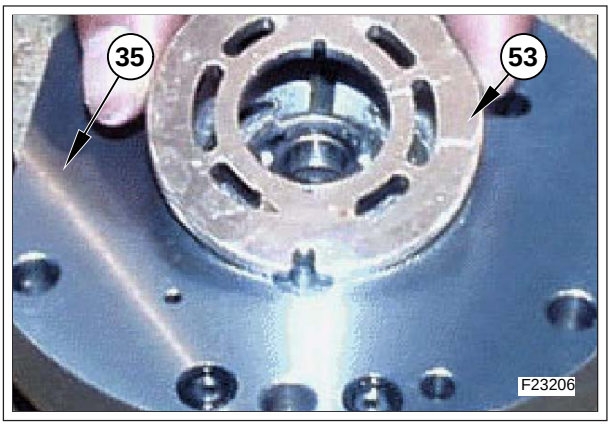
16. Unscrew and remove the 6 socket head screws M8x20 (**18**), that fix the base plate (**35**).



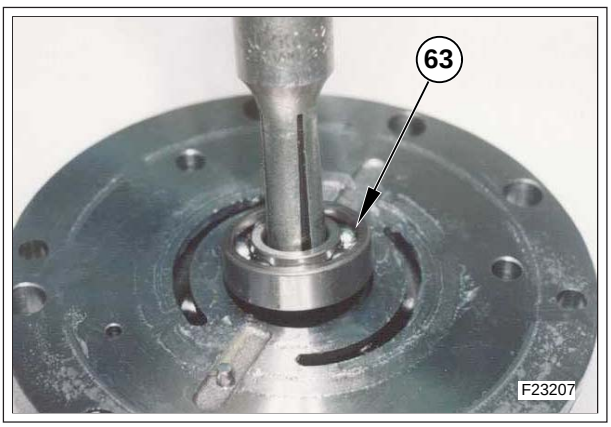
17. Remove carefully the base plate (**35**) until pins are completely out.



18. Turn the base plate (**35**) upside down and remove the valve plate (**53**).



19. Using a puller, remove the bearing (**63**) from the base plate.

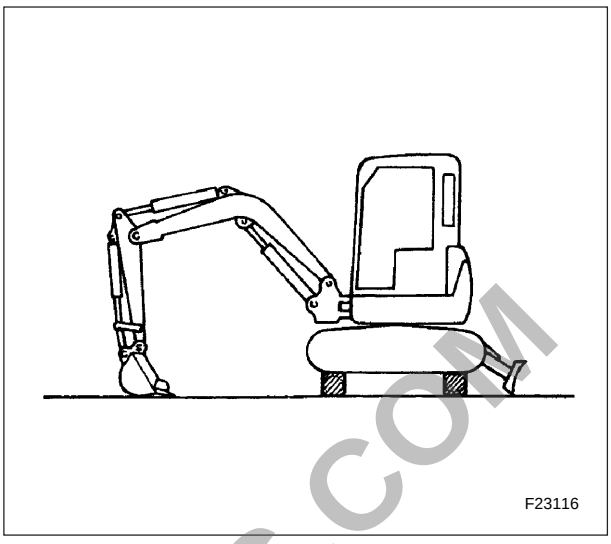


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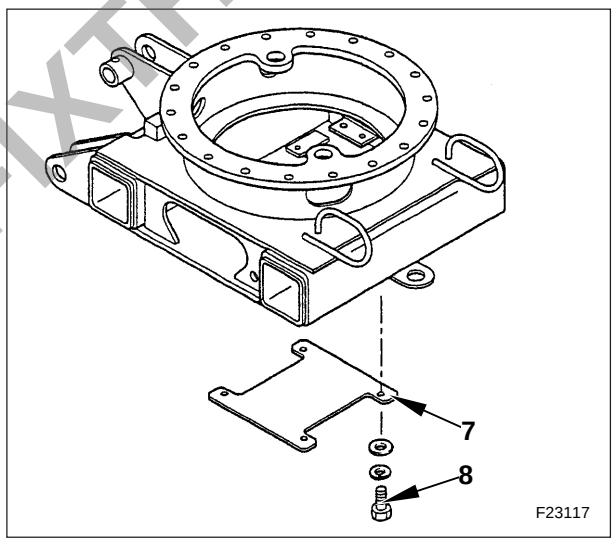
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DISASSEMBLY

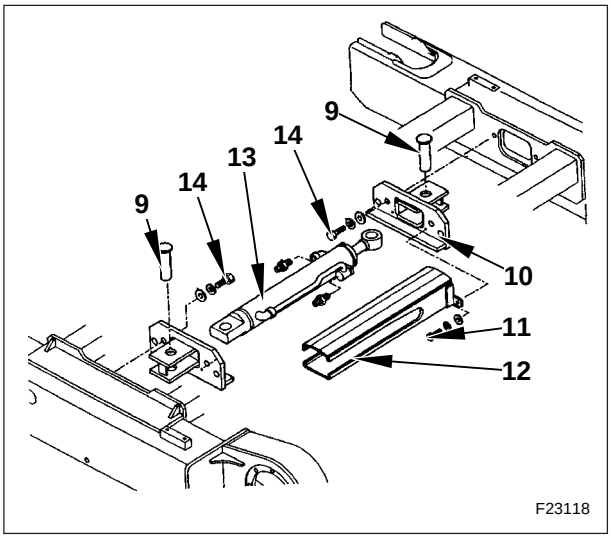
1. Preparation for Removal
Lift up the machine by around 30 cm to secure the working space under the machine, and set a stable supporting stand at four positions, left and right of front and rear of crawler shoes.
Release air in the hydraulic oil tank.



2. Remove capscrews (**8**) and under cover (**7**).



3. Remove the capscrew (**11**) that is fixing the cover (**12**).
Disconnect the hydraulic hose connected to the cylinder crawler width (**13**), and apply a plug to openings.
Remove the capscrews (**14**) that are fixing the bracket (**10**).
Remove the pins (**9**).



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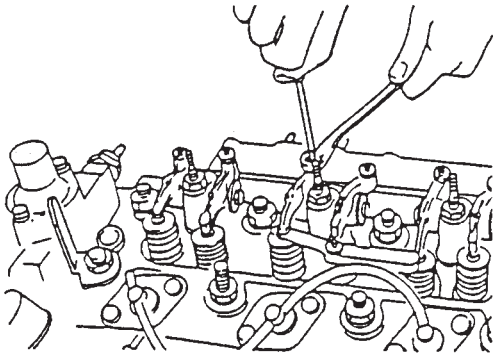
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ADJUSTMENT THE VALVE HEAD CLEARANCE

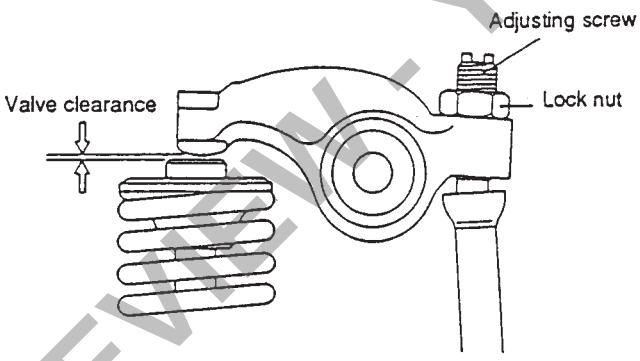
(1) Inspect and adjust a valve head clearance while the engine is in cold state.

(2) Raise the piston in the cylinder to be measured to the top dead center (TDC) of compression.

(3) Loosen the lock nut and adjusting screw. Make sure that the valve cap is free from inclination or trapped dirt.



(4) Insert a thickness gauge in between the rocker arm and valve cap. Tighten the adjusting screw until the clearance listed below is attained.



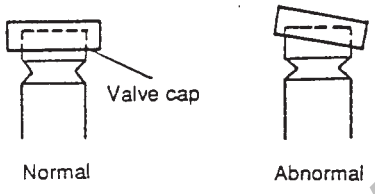
(Adjusting the valve head clearance)

(mm)

	All models
Intake/exhaust valve head cleaarance	0.15 ~ 0.25

∗ : 1. *If the valve cap is worn or otherwise damaged on the head, replace it with a new one.*

2. *Make sure that the valve cap is nested on the head of intake/exhaust valves.*



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CRANKSHAFT

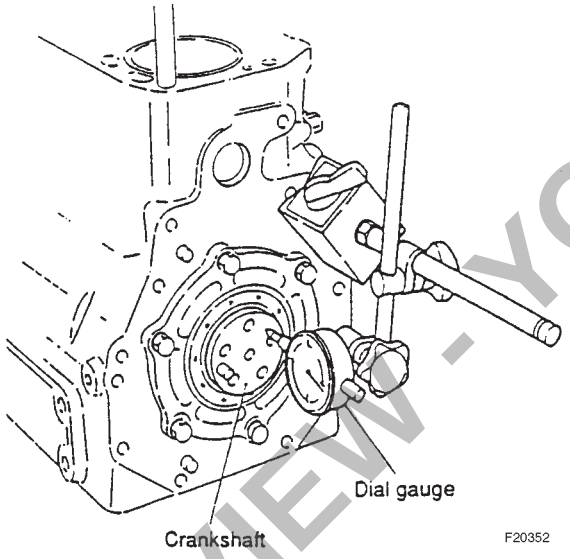
Side gap around the crankshaft

Before extracting the crankshaft and when reassembling it, bring a dial gauge into contact to the end of the crankshaft. Force the crankshaft to both sides in the axial direction to measure the thrust gap. Alternatively, insert a thickness gauge directly into a thrust gap between the thrust metal in the standard part and crankshaft to measure the side gap.

If the limit is exceeded, replace the thrust metal with a new one.

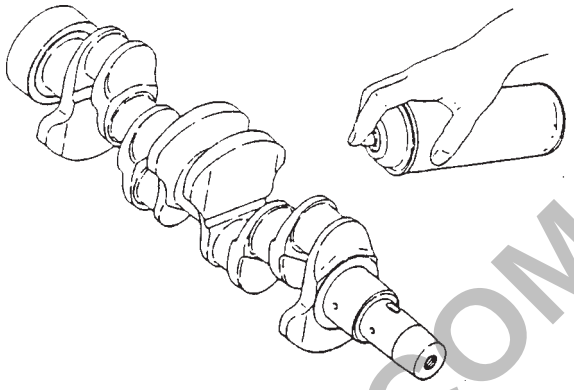
(mm)

	All models
Thrust gap	0.090~0.271



Color check of crankshaft

Clean the crankshaft and check it using a color check kit or a magnaflux inspector. Replace the crankshaft if cracked or badly damaged. If the crankshaft is slightly damaged, correct it by re-grinding.



(Color check inspection) F20351

Checking the metal

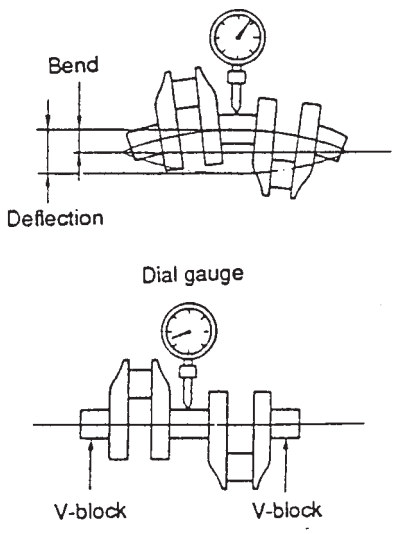
Check the metal for flaking, melting, seizure, and the state of the contact face. Replace the metal if found defective.

Bend of the crankshaft

Support the crankshaft with V-blocks at both ends of the journals; measure the runout at the center journal with a dial gauge while rotating the crankshaft to check the extent of crankshaft bend.

(mm)

	All models
	Standard
Bend	0.02 or less



(Measuring the crankshaft bend) F20353

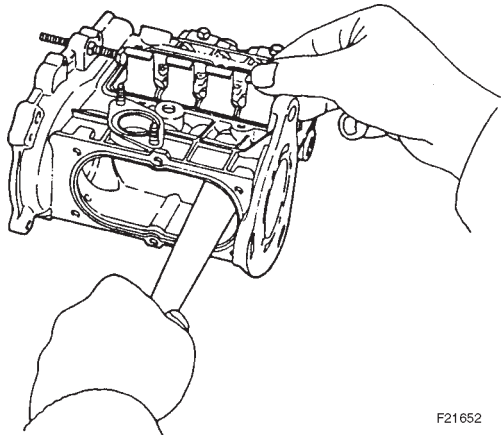
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(12) By using the handle of a hammer, etc., push up the plunger guide from the bottom of the pump and take out the tappet holders (special service tool).

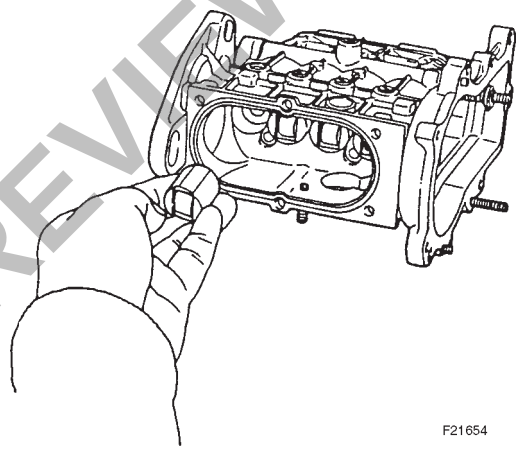
* *Use particular care to remove the tappet holder. Carefully prevent the plunger guide, plunger, etc., from jumping out. This is because the plunger spring is powerful enough to force them out.*



F21652

(13) Take out the plunger guide assembly.

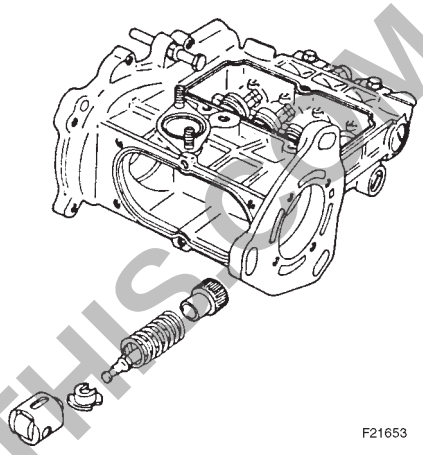
* *Do not erect the fuel injection pump body, wherever possible. Otherwise, the plunger guide assembly falls off. Therfore, hold the fuel injection pump body tilted and remove the plunger guide assembly.*



F21654

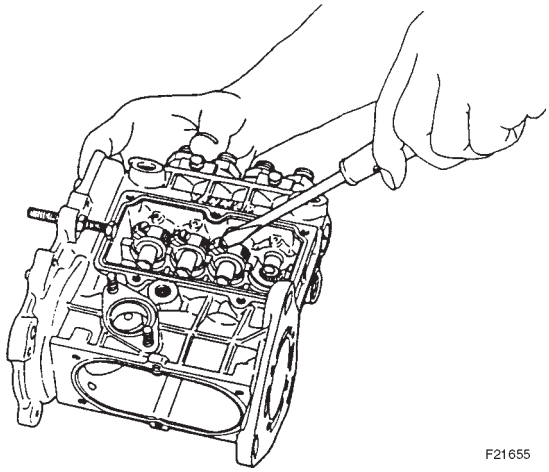
(14) Take out the plunger, plunger spring and plunger spring lower reteiner from the lower part of the fuel injection pump.

* *Separate these parts for each cylinder.*



F21653

(15) Remove the stop screw from the fuel control pinion.



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