INTRODUCTION

TO THE READER

- This manual is written for an experienced technician to provide technical information needed to maintain and repair this machine.
  - Be sure to thoroughly read this manual for correct product information and service procedures.
  - If you have any questions or comments regarding the contents of this manual.

please contact:

Technical Document Center
Hitachi Construction Machinery Co. Ltd.
TEL: 81-298-32-7173
FAX: 81-298-31-1162

ADDITIONAL REFERENCES

- Please refer to the materials listed below in addition to this manual.
  - The Operator's Manual
  - The Parts Catalog
  - Operation Manual of the Engine
  - Parts Catalog of the Engine
  - Hitachi Training Material

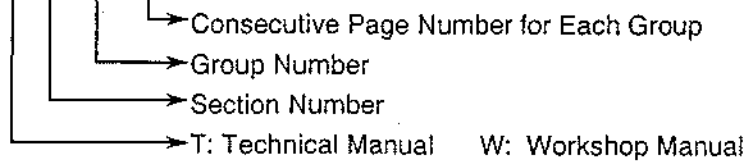
MANUAL COMPOSITION

- The service manual consists of two portions: the T/M (Technical Manual) portion and the W/M (Workshop Manual) portion.
  - Information included in the T/M portion: technical information needed for predelivery and delivery, operation and activation of all devices and systems, operational performance tests, and troubleshooting procedures.
  - Information included in the W/M portion: technical information needed for maintenance and repair of the machine, tools and devices needed for maintenance and repair, maintenance standards, and removal/installation and assemble/disassemble procedures.

PAGE NUMBER

- Each page has a number, located on the center lower part of the page, and each number contains the following information:

Example: T 01-03-05



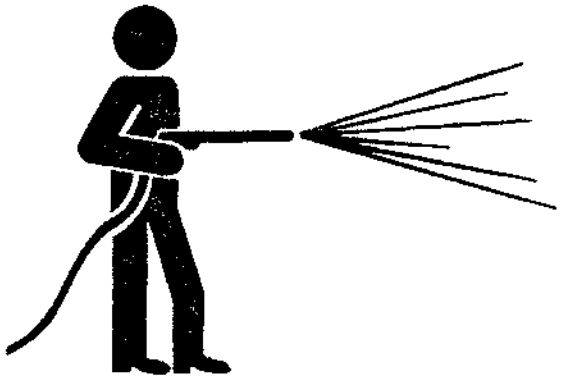
PRACTICE SAFE MAINTENANCE

- Fully understand the procedures of the service to be done before starting work. Also, make sure that your co-workers understand the service procedures as well.

- Prepare and Clean the Work Area
  - Select a firm, level surface, protected from wind and rain.
  - If working under the machine is required, be sure to bring the machine to a shop where a suitable pit is provided.
  - Before starting any service work, clean the work area. Remove any objects that may be a safety hazard to the service personnel or bystanders.
  - Remove any buildup of grease, oil, paints, or debris.

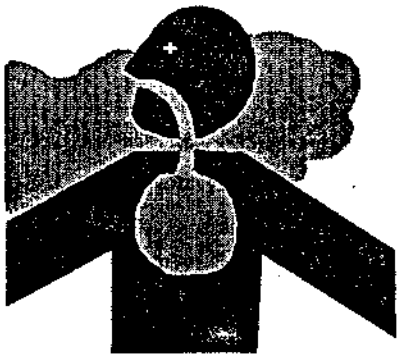
- Park the Machine Safely
  - Refer to the PREPARATION FOR SERVICE WORK section on the previous page.

SA-028



SA-033

- Beware of Exhaust Fumes
  Engine exhaust fumes can cause sickness or death.
  - If you must operate inside a building, be sure there is adequate ventilation.
  - Either use an exhaust pipe extension to remove the exhaust fumes, or open doors and windows to bring enough outside air into the area.



SA-016

- Illuminate Work Area Safely
  - Illuminate your work area adequately but safely.
  - Use a portable safety light for working inside or under the machine.
  - Make sure that the bulb is enclosed by a wire cage. The hot filament of an accidentally broken bulb can ignite spilled fuel or oil.

- Allow the engine and the hydraulic oil to cool before starting any service work.

- Disconnect the battery ground cable (−) before servicing the electrical system or welding on the machine.

SA-037

PRECAUTIONS FOR DISASSEMBLING AND ASSEMBLING

Preparations for Disassembling

- Clean the Machine

  Thoroughly wash the machine before bringing it into the shop. Bringing a dirty machine into the shop may cause machine components to be contaminated during disassembling/assembling, resulting in damage to machine components, as well as decreased efficiency in service work.

- Inspect the Machine

  Be sure to thoroughly understand disassembling procedures beforehand, to help avoid incorrect disassembling of components as well as the purchase of unnecessary service parts.
  Check and record the items listed below to help prevent problems from occurring in the future.

  · The machine model, machine serial number, and hour meter reading,
  · Reason for disassembly (symptoms, failed parts, and causes).
  · Clogging of filters and oil or air leakages, if any.
  · Capacities and dirtiness of lubricants.
  · Loose or damaged parts.

- Prepare and Clean Tools and Disassembly Area

  Prepare tools to be used and areas for disassembling as well as for disassembled parts. Clean the tools and areas.

Precautions for Disassembling and Assembling

- Precautions for Disassembling

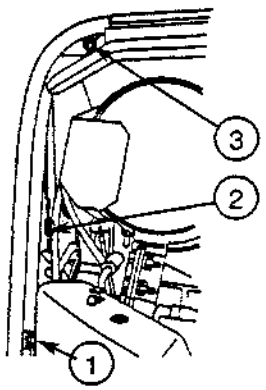
  · Be sure to provide appropriate containers for draining fluids.
  · Use matching marks for easier reassembling.
  · Be sure to use specified special tools, when so instructed.
  · If a part or component cannot be removed after removing its securing nuts and bolts, do not attempt to remove it forcibly. Find the cause(s), then take appropriate measures to remove it.
  · Orderly arrange disassembled parts. Put marks and tags on them as necessary.
  · Store common parts, such as nuts and bolts with reference to where they are to be used and in a manner that will prevent loss.
  · Inspect contact or sliding surfaces of disassembled parts for abnormal wear, sticking, or other damage.
  · Measure and record degrees of wear and clearances.

- Precautions for Assembling

  · Be sure to clean all parts and inspect them for any damage. If any damage is found on a part, repair or replace it with a new one.
  · Dirt or debris on contact or sliding surfaces may shorten the service life of the machine. Take care not to contaminate any contact or sliding surfaces of the parts to be assembled.
  · Be sure that liquid-gasket-applied surfaces are clean and dry.
  · If an anti-corrosive agent has been used on a new part, be sure to thoroughly clean the part so as to remove the agent.
  · Utilize matching marks when assembling.
  · Be sure to use designated tools to assemble bearings, bushings and oil seals.
  · Keep a record of the number of tools used for disassembling/assembling. After assembling is complete, count the number of tools, so as to make sure that no tools are left in the assembled components.

5. Remove muffler side cover mounting bolts (1, 2 and 3).

: 17 mm



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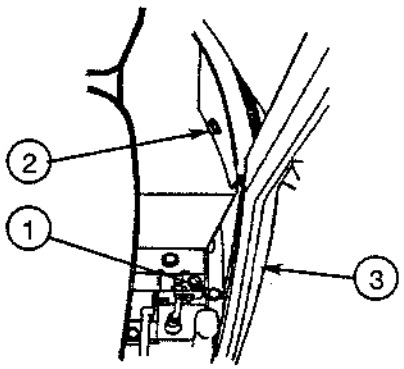
6. Remove cover mounting bolts (1, 2) on the operator's seat side, then remove cover (3).

: 17 mm



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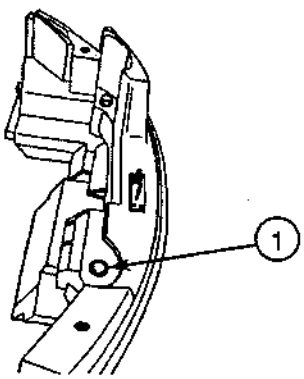
7. Remove two counterweight mounting bolts (1).

: 41 mm



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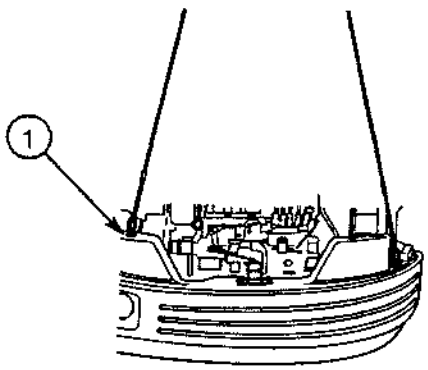
8. Install eye bolts and connect the counterweight to a crane with wire ropes.
Before hoisting the counterweight, use the crane to move backward from the machine.

CAUTION: The approximate weight of the counterweight is 955 kg.



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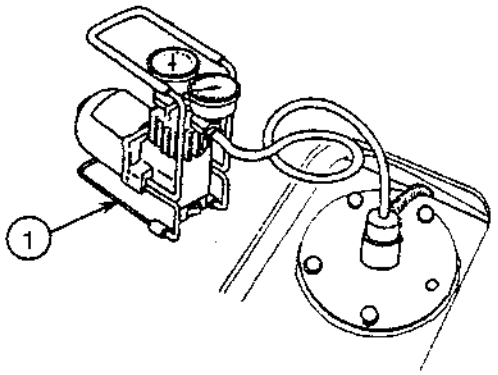
8. Install vacuum pump (1) to the threaded cap opening on the hydraulic oil tank. Operate the pump to create negative pressure in the tank.

NOTE: Keep the vacuum pump running while disconnecting or connecting hoses.



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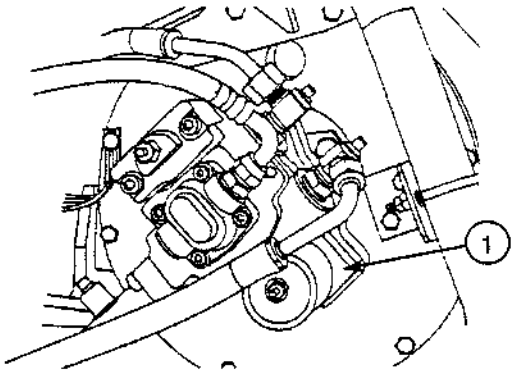
9. Disconnect all hoses from pump (1).

: 22 mm, 27 mm



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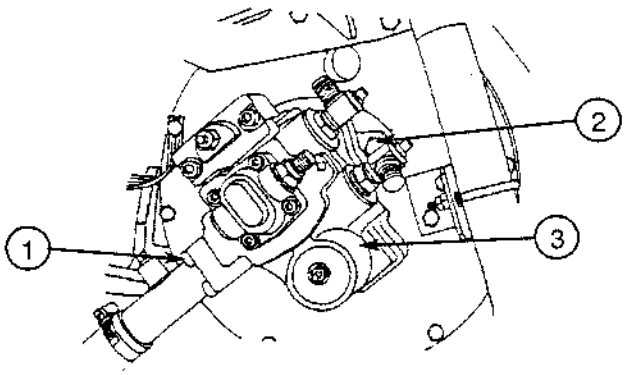
10. Remove four bolts (1) and the suction piping. Connect pump (3) to a crane using a lifting belt. Slightly raise pump (3) so that the belt is tight. Remove two bolts (2), then remove pump (3) using a crane.

: 19 mm, : 8 mm

CAUTION: The approximate weight of the pump is 51 kg.



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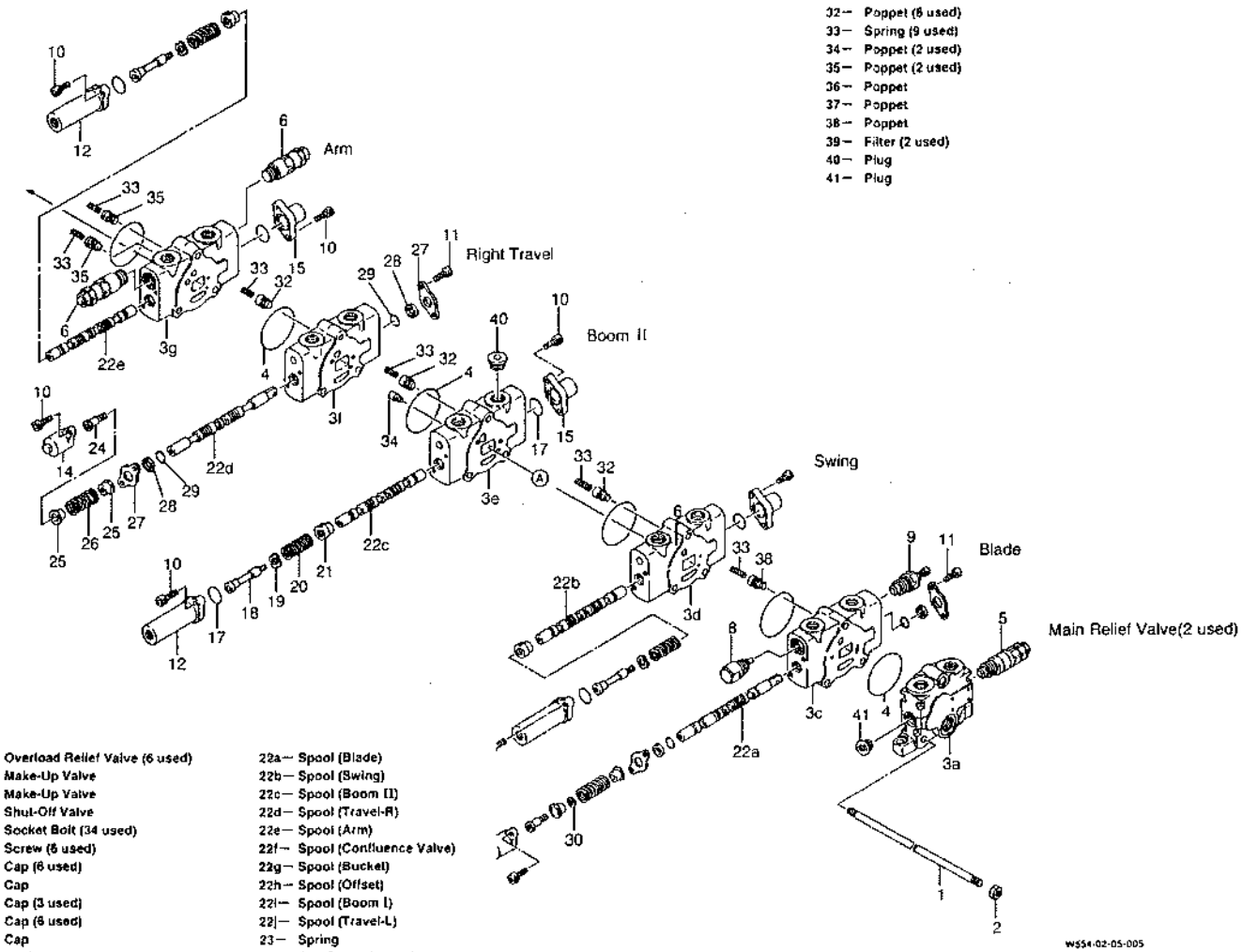


1— Rod (3 used)
2— Nut (6 used)
3a— Housing (Relief)
3b— Housing (Relief)
3c— Housing (Blade)
3d— Housing(Swing)
3e— Housing (Boom II)
3f— Housing (Travel-R)
3g— Housing (Arm)
3h— Housing (Confluence Valve)
3i— Housing (Bucket)
3j— Housing (Offset)
3k— Housing (Boom I)
3l— Housing (Travel-L)
4— O-Ring (11 used)
5— Main Relief Valve (2 used)
6— Overload Relief Valve (6 used)
7— Make-Up Valve
8— Make-Up Valve
9— Shut-Off Valve
10— Socket Bolt (34 used)
11— Screw (6 used)
12— Cap (6 used)
13— Cap
14— Cap (3 used)
15— Cap (6 used)
16— Cap
17— O-Ring (14 used)
18— Spool End (7 used)
19— Spring Seat (7 used)
20— Spring (6 used)
21— Spring Seat (7 used)
22a— Spool (Blade)
22b— Spool (Swing)
22c— Spool (Boom II)
22d— Spool (Travel-R)
22e— Spool (Arm)
22f— Spool (Confluence Valve)
22g— Spool (Bucket)
22h— Spool (Offset)
22i— Spool (Boom I)
22j— Spool (Travel-L)
23— Spring
24— Cap Screw (3 used)
25— Spring Seat (6 used)
26— Spring (3 used)
27— Seal Plate (6 used)
28— Wiper (6 used)
29— O-Ring (6 used)
30— Washer
31— Filter
32— Poppet (6 used)
33— Spring (9 used)
34— Poppet (2 used)
35— Poppet (2 used)
36— Poppet
37— Poppet
38— Poppet
39— Filter (2 used)
40— Plug
41— Plug

Disassemble Swing Motor

Thoroughly clean the motor periphery.
Before disassembling, make matching marks on the mating surfaces of cover (7) and housing (22).
Do not remove the plugs, pin (2) or bearings (6, 23) unless necessary.

1. Secure the motor on a workbench. Remove relief valve (8) from the motor.

: 32 mm

2. Remove socket bolts (9, 30 and 34), then remove cover (7) and swing parking brake switch valve (32).

: 5 mm, 10 mm

3. Remove valve plate (10) from cover (7).

IMPORTANT: Take care not to let valve plate (10) fall or to damage it when handling. In some cases, valve plate (10) may remain in housing (22) when cover (7) is removed.

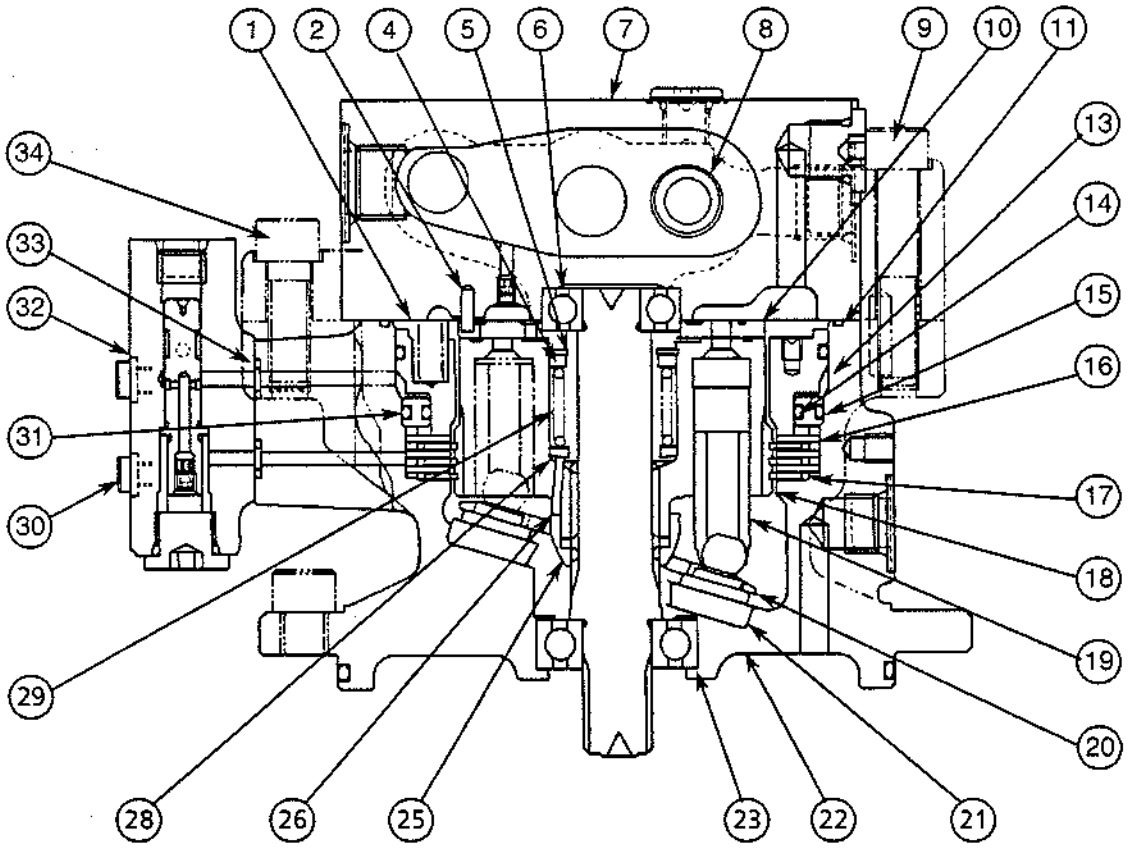
4. Remove spring (1) and O-rings (11, 33).

5. Remove brake piston (13) from housing (22) using socket bolt (30).

6. Remove collar (31) from housing (22). Remove O-rings (14, 15).

7. Rotate housing (22) 90 degrees. Remove cylinder block (18) from housing (22).
Remove plungers (19), retainer plate (20), holder (25), pins (26), collar (28), spring (29), washer (4), retaining ring (5), friction plates (16) and disk plates (17).

8. Remove swash plate (21).



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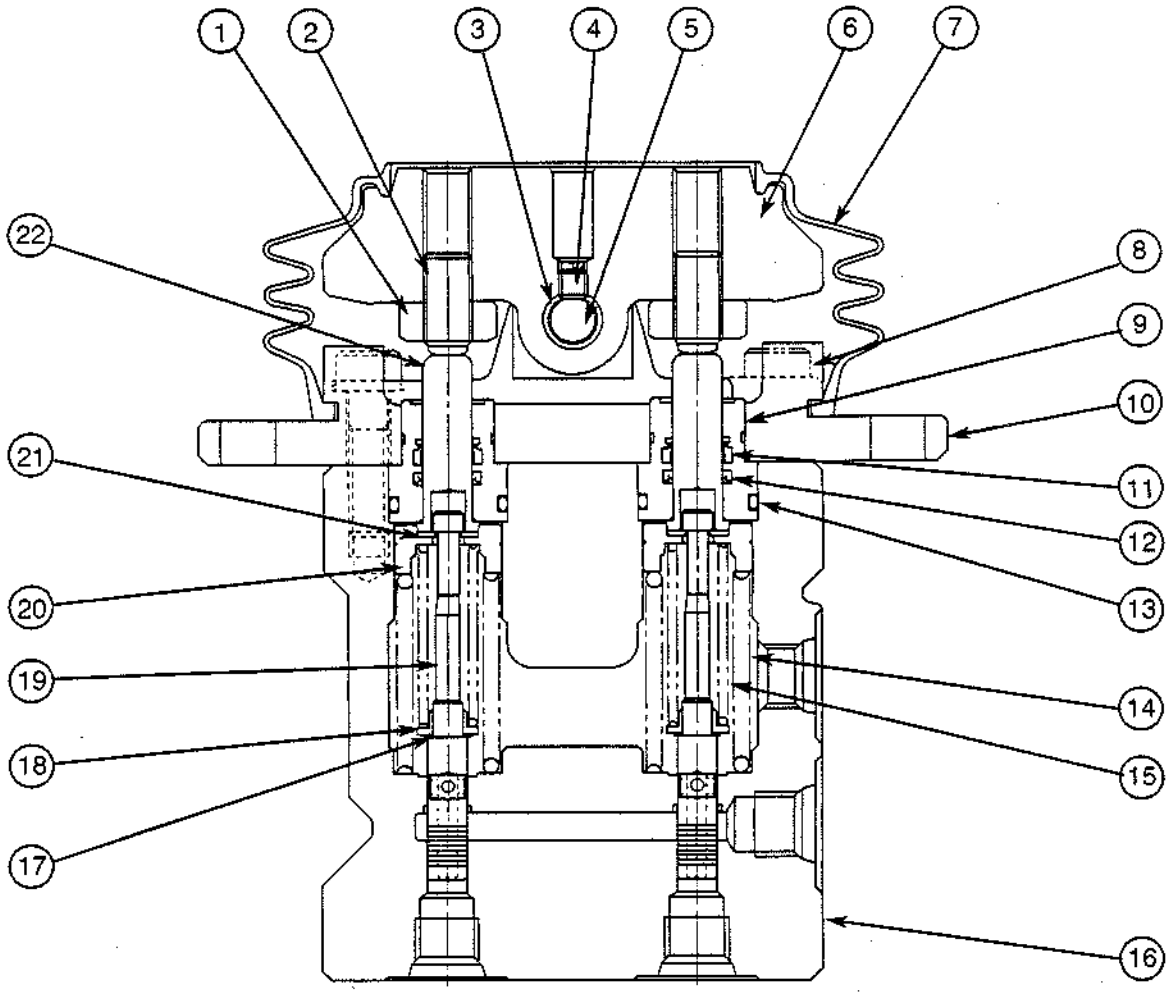
(Offset Pilot Valve)



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1— Lock Nuts
2— Set Screws
3— Bushing
4— Set Screw
5— Pin
6— Cam
7— Boot
8— Socket Bolts
9— Bushings
10— Plate
11— Dust Seal
12— Oil Seal
13— O-Ring
14— Return Spring
15— Balance Spring
16— Housing
17— Shims
18— Spacers
19— Spools
20— Spring Guide
21— Washers
22— Pushers

REMOVE AND INSTALL SWING BEARING

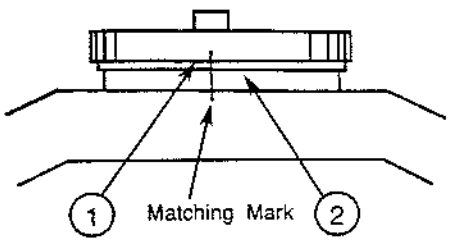
Remove Swing Bearing

CAUTION:

1. **Hydraulic fluid under pressure can penetrate the skin or eyes, causing serious injury. Avoid this hazard by relieving pressure before disconnecting any hydraulic lines.**
2. **Hydraulic oil becomes hot during operation. Disconnecting hydraulic lines soon after operation can result in severe burns. Wait for the oil and components to cool before starting work.**

Before removing the swing bearing, the upperstructure must be removed. Refer to "Remove and Install Main Frame" in Section 02 Upperstructure.
The procedures to be followed after removing the upperstructure are given here.

1. Make matching marks on the mating surfaces of swing bearing (1) inner race and track frame (2).

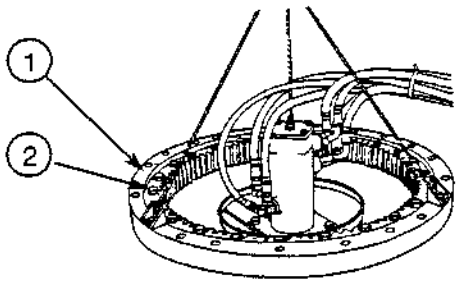


W105-03-01-001

2. Remove all bearing mounting bolts (2). Connect swing bearing (1) to a crane using lifting brackets and wire ropes. Remove bearing (1).

: 19 mm

CAUTION: The approximate weight of the swing bearing is 69.3 kg.



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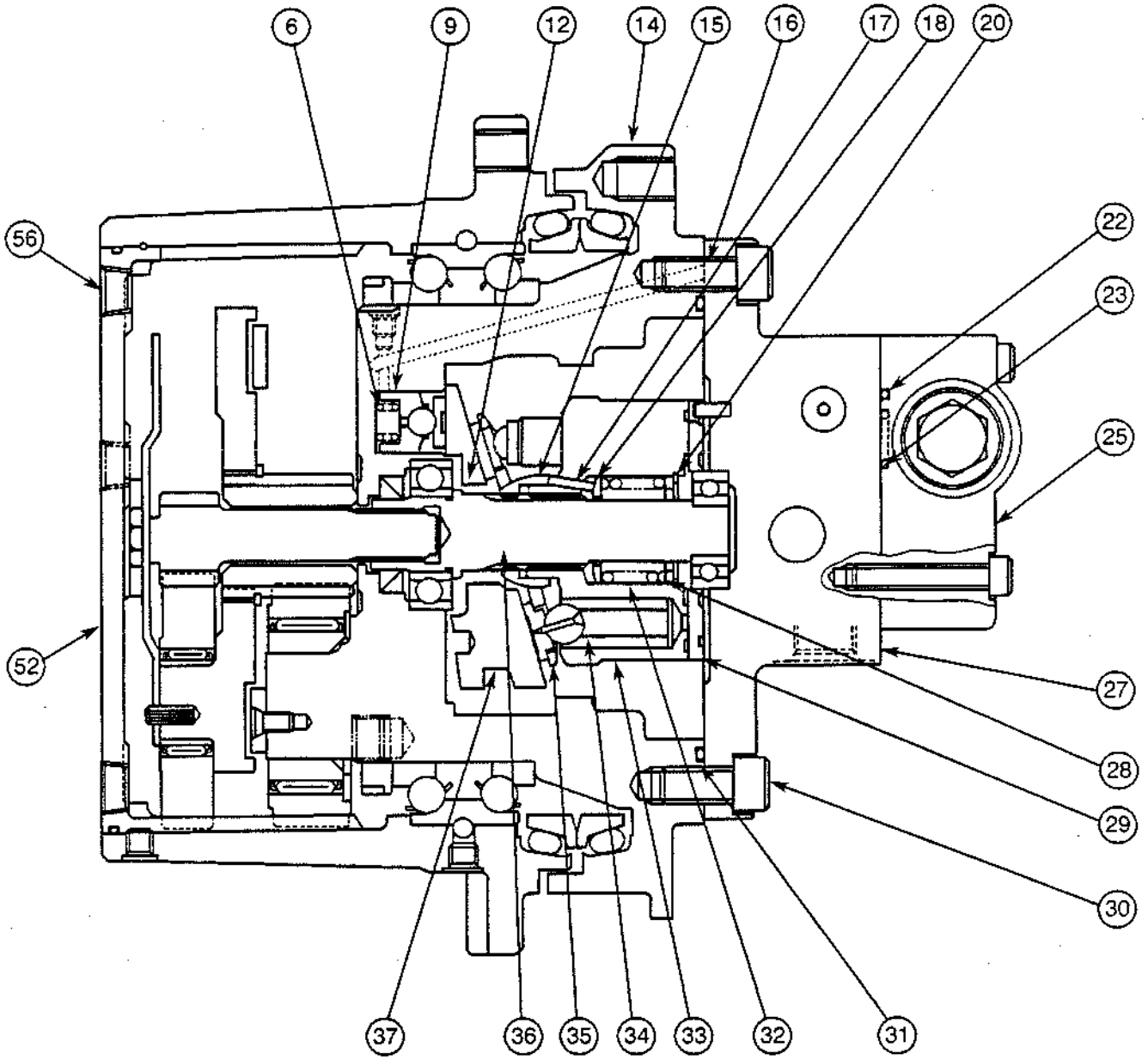

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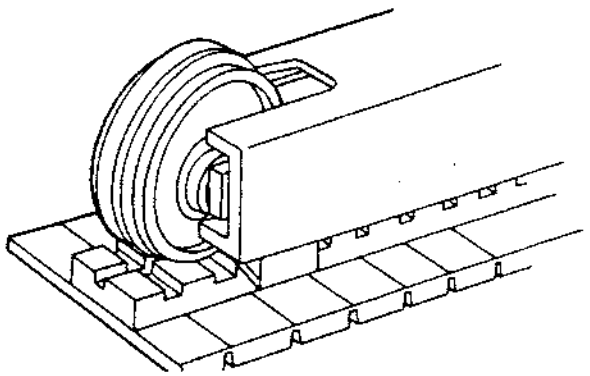
6— Spring (2 used)
9— Control Piston (2 used)
12— Steel Ball (2 used)
14— Housing
15— Holder
16— O-Ring
17— Pin (3 used)
18— Collar
20— Retaining Ring
22— O-Ring (3 used)
23— O-Ring (2 used)
25— Valve Housing
27— Brake Valve
28— Washer
29— Valve Plate
30— Socket Bolt (6 used)
31— O-Ring
32— Spring
33— Cylinder Block
34— Plunger (9 used)
35— Retainer
36— Shaft
37— Swash Plate
52— Cover
56— Plug (3 used)

REMOVE AND INSTALL FRONT IDLER

The procedures to be followed after removing the track links are given here. Refer to "Remove and Install Track Links" in Group 07 for instructions on removal and installation of the track links.

CAUTION: Stay out of the removing direction of the front idler.
The approximate weight of the front idler is 43 kg.



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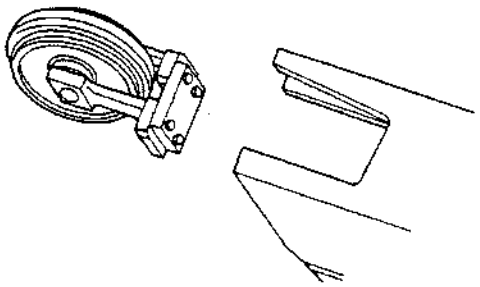
Remove Front Idler

1. Move the front idler and yoke assembly out of place using a crowbar.
2. Remove the front idler and yoke assembly from the track frame.

IMPORTANT: Do not directly place the front idler on the ground.
Use blocks when temporarily putting it down.



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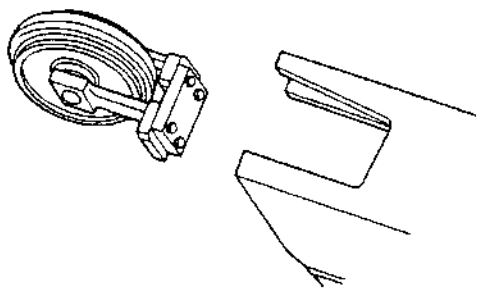
Install Front Idler

1. To install the front idler, simply perform the removing procedures in reverse.

NOTE: Before installing, check that the yoke is correctly positioned. Apply grease to the sliding surfaces of the track frame and bearing after cleaning them.



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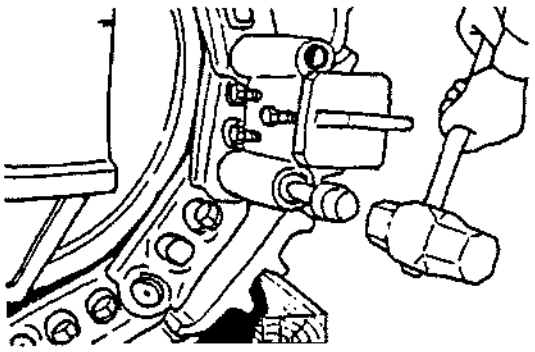
5. Tap in the master pin using a hammer and master pin installer.

IMPORTANT: Tap in the master pin in the correct direction. After inserting, install the lock pin. Be sure to use a new lock pin, not a used one.



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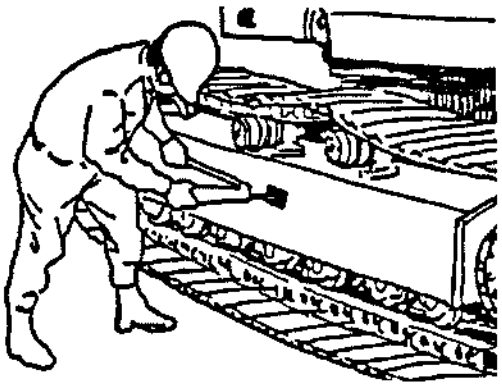
6. Tighten track adjuster valve (1) and add grease via fitting (2) until the sag is within specifications.

: 19 mm, : 88 N·m (9 kgf·m)

Track Sag Specifications (A)

Steel Track : 170~180 mm

Rubber Tracks : 10~15 mm



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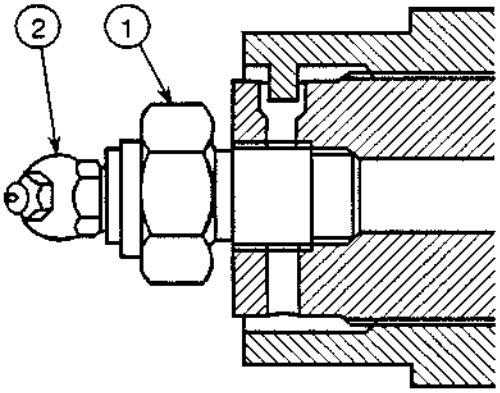

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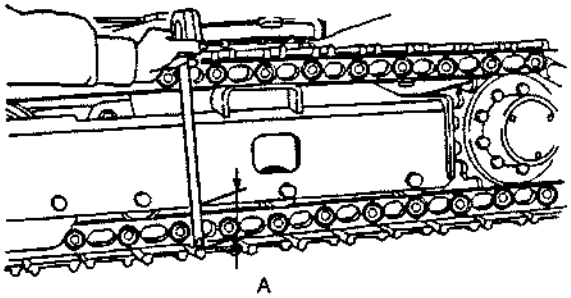

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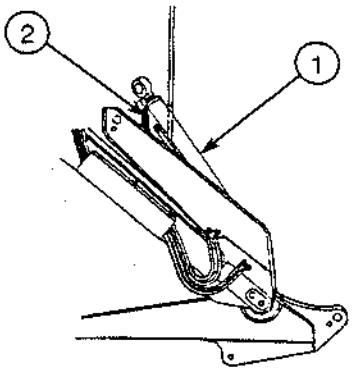
5. Raise cylinder (1) using a crane to make disconnection of hose (2) easier. Disconnect hoses (2) and put a plug on each hose end. Move the lifting belt to the center of gravity of cylinder (1) for stable lifting. Remove cylinder (1) using a crane.

: 22 mm, 27 mm

CAUTION: The approximate weight of the arm cylinder is 35 kg.



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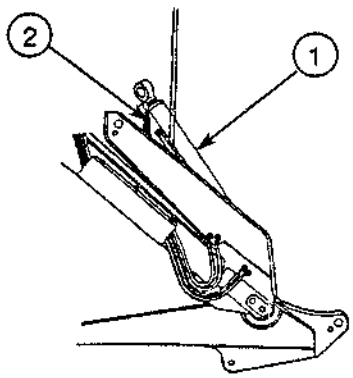
Install Arm Cylinder

1. Raise cylinder (1) bottom, as illustrated, and connect hose (2) to cylinder (1).

: 22 mm, : 39 N·m (4 kgf·m)

: 27 mm, : 93 N·m (9.5 kgf·m)



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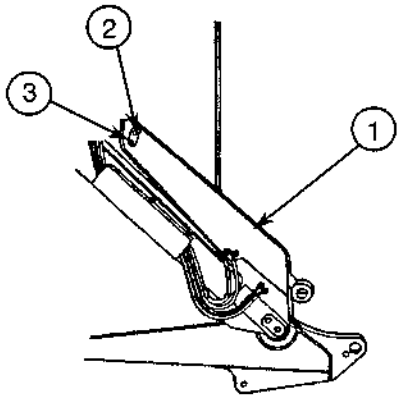
2. Align the pin holes on the cylinder bottom and stay (1). Install pin (2). Tighten bolt (3) to secure pin (2).

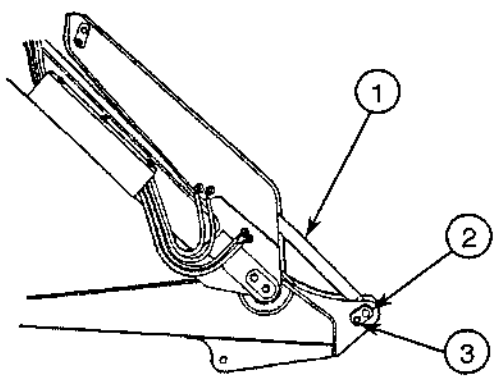
: 22 mm, : 137 N·m (14 kgf·m)



W554-04-02-008

3. Align the pin holes on the cylinder rod end and arm. Install pin (2). Tighten bolt (3) to secure pin (2).

: 22 mm, : 137 N·m (14 kgf·m)



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SERVICE DATA AND SPECIFICATIONS (S.D.S.)

INSPECTION AND ADJUSTMENT

DRIVE BELT DEFLECTION

Unit: mm

	Used belt deflection		Set deflection of new belt
	Limit	Adjusted deflection	
Alternator	20	11 - 13	9 - 11
Air conditioner compressor	12	6 - 7.5	5 - 6.5
Power steering oil pump	15	8 - 9.5	7 - 8.5
Applied pushing force	10 kg		

Inspect drive belt deflections when engine is cold.
If engine is hot, check deflection in 30 minutes or more.

INJECTION NOZZLE

Injection pressure kg/cm²	
Used nozzle	100 - 105
New nozzle	105 - 115

VALVE CLEARANCE

Intake and exhaust	mm	0.35

COMPRESSION PRESSURE

Unit: (kg/cm²)/rpm

Standard	30/200
Minimum	25/200
Differential limit between cylinders	3/200

IDLE SPEED

	F.I.C.D. OFF	F.I.C.D. ON
Idle speed rpm	700±50 (Automotive use) 625±25 (Industrial use)	850±50

COOLING SYSTEM

Radiator cap relief pressure kg/cm²	0.9
Cooling system leakage testing pressure kg/cm²	1.0

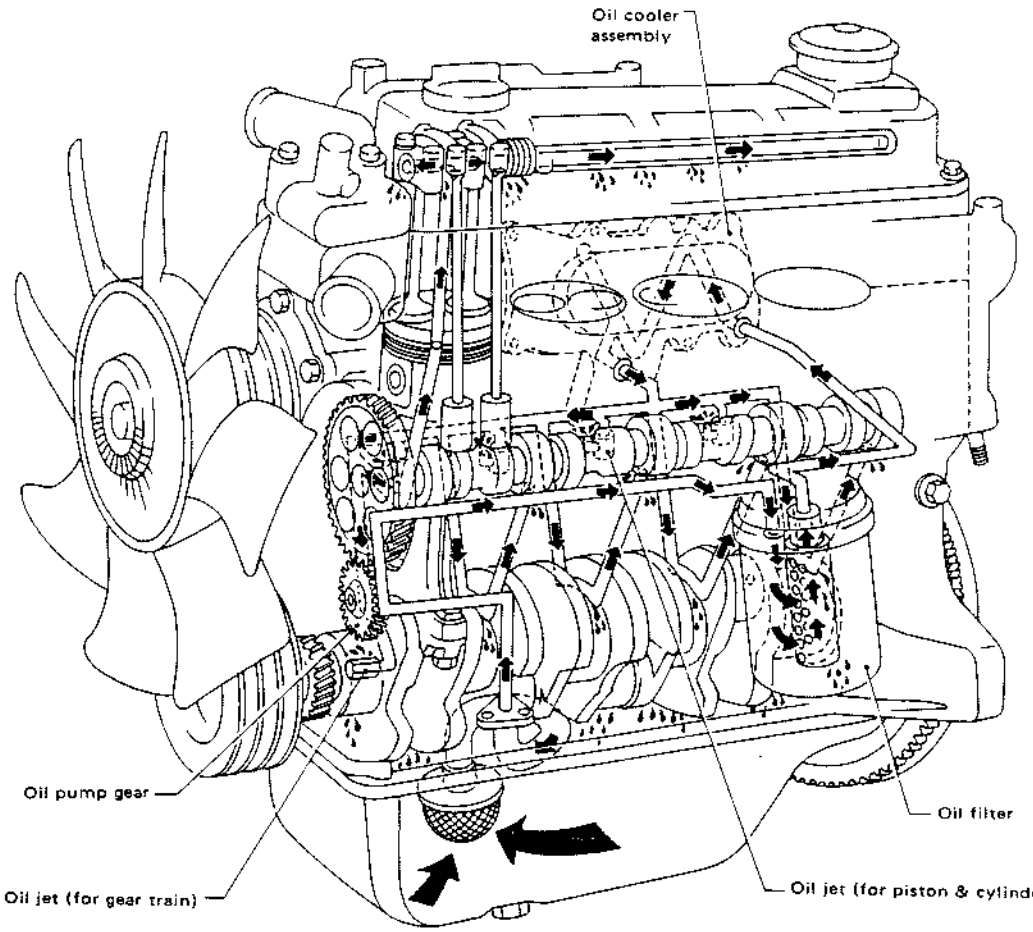
TIGHTENING TORQUE

Unit	kg-m
Intake manifold nut/bolt	1.5 - 2.0
Exhaust manifold nut	2.5 - 3.0 *3.0 - 3.5
Alternator adjusting bar bolt	1.6 - 2.1
Idler pulley nut (A/C compressor)	3.1 - 4.2
P/S oil pump adjusting lock bolt	3.1 - 4.2
Oil pan drain plug	5.5 - 6.0
Injection nozzle to cylinder head	5.5 - 6.5
Spill tube nut	3.0 - 4.0
Injection tube flare nut	2.0 - 2.5
Valve clearance adjusting screw lock nut	1.4 - 1.8
Rocker cover screw	0.1 - 0.2
Cylinder block drain plug	3.0 - 4.0

*: With turbocharged engine only

LUBRICATION SYSTEM

LUBRICATION CIRCUIT



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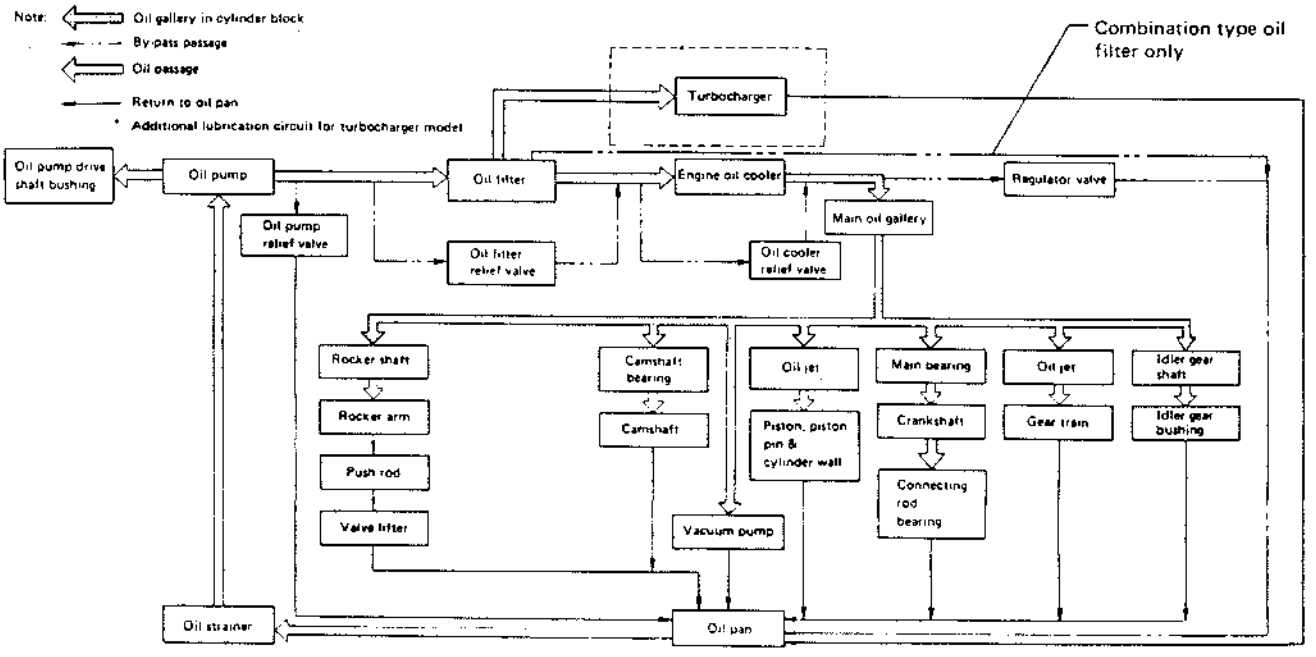

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