Technical Manual

EX25
EX35
EX40
Excavator

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HITACHI

KM581E-01
T581-01

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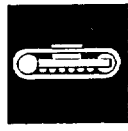
TECHNICAL MANUAL
EX25·35·40
EXCAVATOR



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FOLLOW SAFE PROCECURES

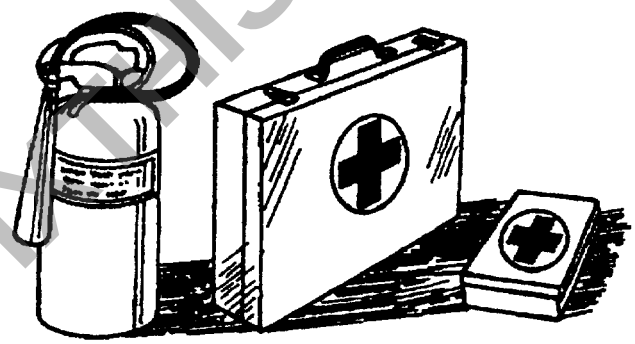
Unsafe work practices are dangerous. Understand service procedure before doing work; do not attempt shortcuts.

PREPARE FOR EMERGENCIES

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



SA-020

HANDLE FLUIDS SAFELY – AVOID FIRES

Handle fuel with care; it is highly flammable. Do not refuel the machine while smoking or near open flame or sparks. Always stop engine before refueling machine. Fill fuel tank outdoors.



SA-018

Store flammable fluids away from fire hazards. Do not incinerate or puncture pressurized containers.

Make sure machine is clean of trash, grease, and debris.

Do not store oily rags; they can ignite and burn spontaneously.



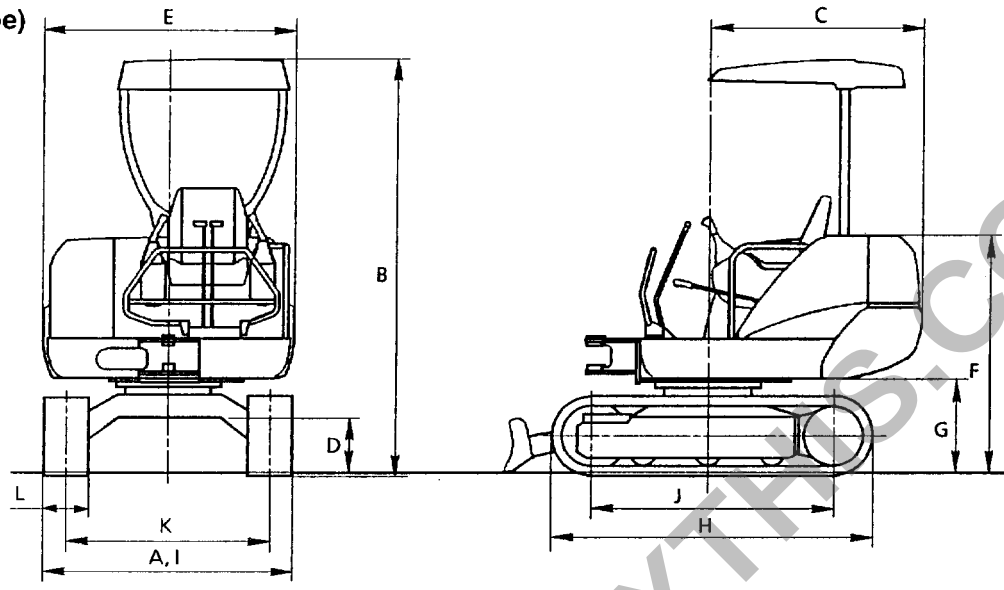
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SPECIFICATIONS

EX25·EX35

(Canopy Type)



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Model	EX25	EX35
Type of front attachment	Boom-Swing Type	
Bucket capacity (Heaped)	0.07 m³	0.10 m³
Operating weight	2 400 kg (5 291 lb)	3 100 kg (6 834 lb)
Basic machine weight	1 790 kg (3 946 lb)	2 370 kg (5 225 lb)
Engine :ISUZU 3KR1,3KR2	18.9 kW (25 ps) / 2400 min-1 (rpm)	19.1 kW (26 ps) / 2200 min-1 (rpm)
A : Overall width	1 450 mm (4 ft 9 in.)	1 520 mm (5 ft 0 in.)
B : Overall height	2 340 mm (7 ft 8 in.)	2 360 mm (7 ft 9 in.)
C : Rear end swing radius	1 230 mm (4 ft 0 in.)	1 380 mm (4 ft 6 in.)
D : Minimum ground clearance	※ 310 mm (1 ft 0 in.)	※ 325 mm (1 ft 1 in.)
E : Overall width of upperstructure	1 420 mm (4 ft 8 in.)	
F : Engine cover height	※ 1 340 mm (4 ft 5 in.)	※ 1 360 mm (4 ft 6 in.)
G : Counterweight clearance	※ 540 mm (1 ft 9 in.)	※ 560 mm (1 ft 10 in.)
H : Undercarriage length	1 840 mm (6 ft 0 in.)	2 075 mm (6 ft 10 in.)
I : Undercarriage width	1 450 mm (4 ft 9 in.)	1 520 mm (5 ft 0 in.)
J : Sprocket center to idler center	1 450 mm (4 ft 9 in.)	1 600 mm (5 ft 3 in.)
K : Track gauge	1 150 mm (3 ft 9 in.)	1 220 mm (4 ft 0 in.)
L : Track shoe width	300 mm (11.8 in.)	
Blade width	1 450 mm (4 ft 9 in.)	1 520 mm (5 ft 0 in.)
Blade height	300 mm (11.8 in.)	
Swing speed	10.0 min-1 (rpm)	10.5 min-1 (rpm)
Travel speed (Fast / Slow)	3.2/2.0 km/h (2.0 / 1.2 mph)	4.2/2.8 km/h (2.6 / 1.7 mph)
Gradeability	30° (tan θ = 0.58)	
Ground pressure (Grouser shoe)	0.25 bar (0.25 kgf / cm², 3.6 psi)	0.28 bar (0.29 kgf / cm², 4.1 psi)

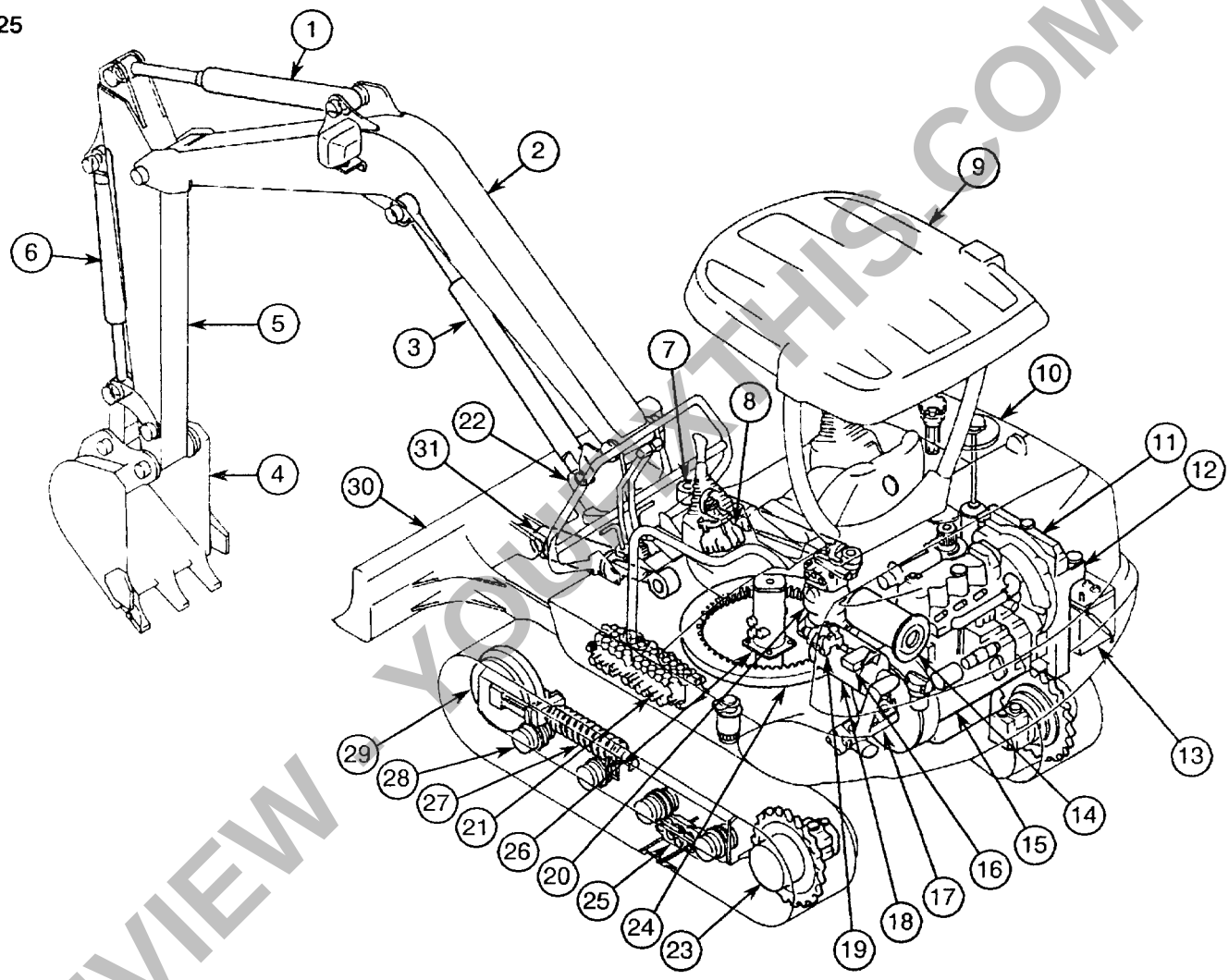
※ The dimensions exclude the height of the shoe lug.

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OUTLINE

The hydraulic excavator consists of three main components.
They are the FRONT ATTACHMENT, UPPERSTRUCTURE and UNDERCARRIAGE.

EX25



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FRONT ATTACHMENT



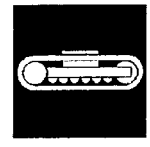
1— Arm Cylinder
2— Boom
3— Boom Cylinder
4— Bucket
5— Arm
6— Bucket Cylinder

UPPERSTRUCTURE



7— Boom-Swing Cylinder
8— Pilot Valve
9— Canopy
10— Hydraulic Oil Tank
11— Radiator
12— Oil Cooler
13— Battery
14— Air Cleaner
15— Engine
16— Pilot Shut-Off Valve
17— Pump Device
18— Muffler
19— Solenoid Valve
20— Swing Device
21— Control Valve
22— Swing Post

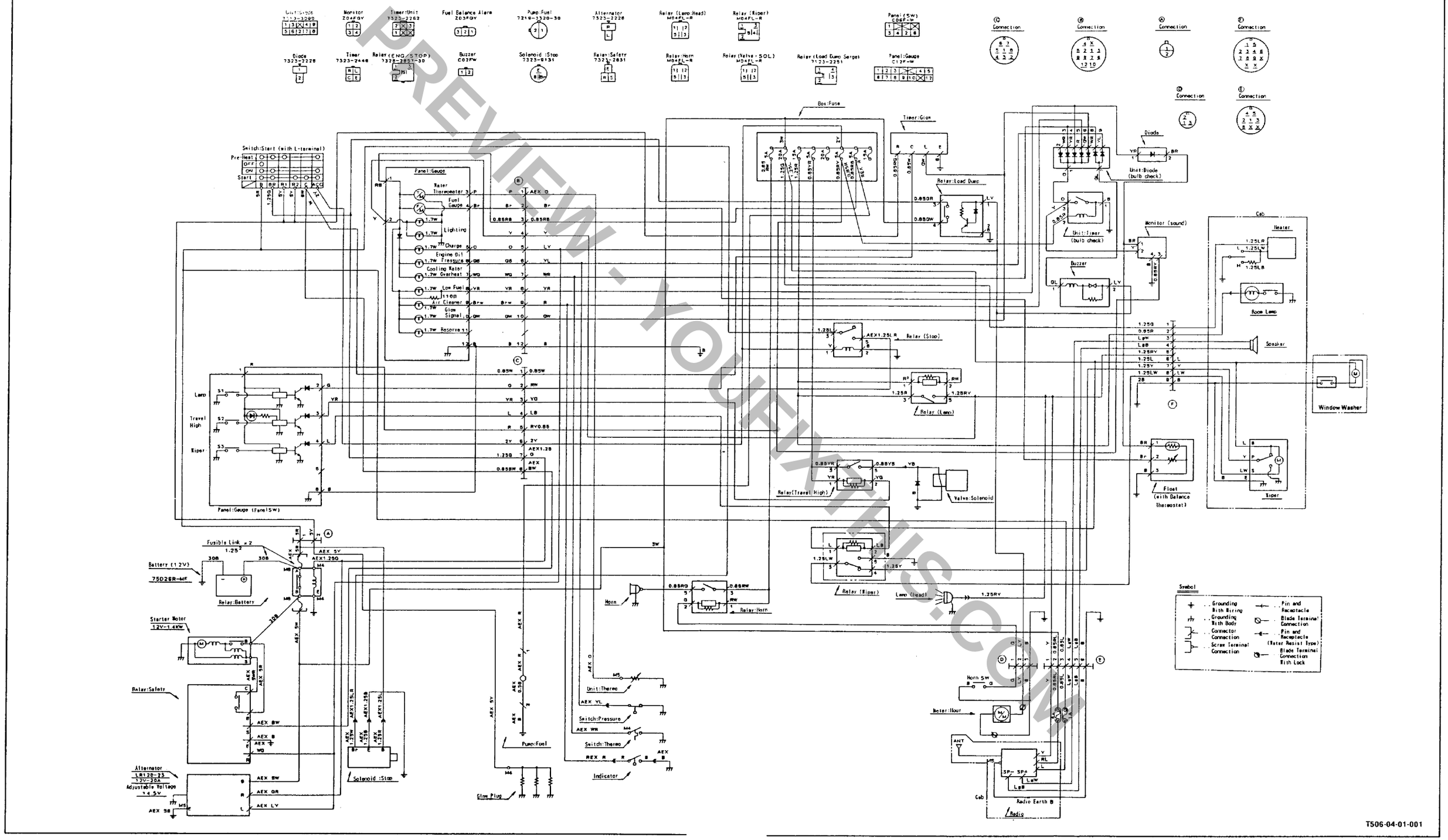
UNDERCARRIAGE



23— Travel Device
24— Swing Bearing
25— Track Link
26— Center Joint
27— Adjuster
28— Lower Roller
29— Front Idler
30— Blade
31— Blade Cylinder

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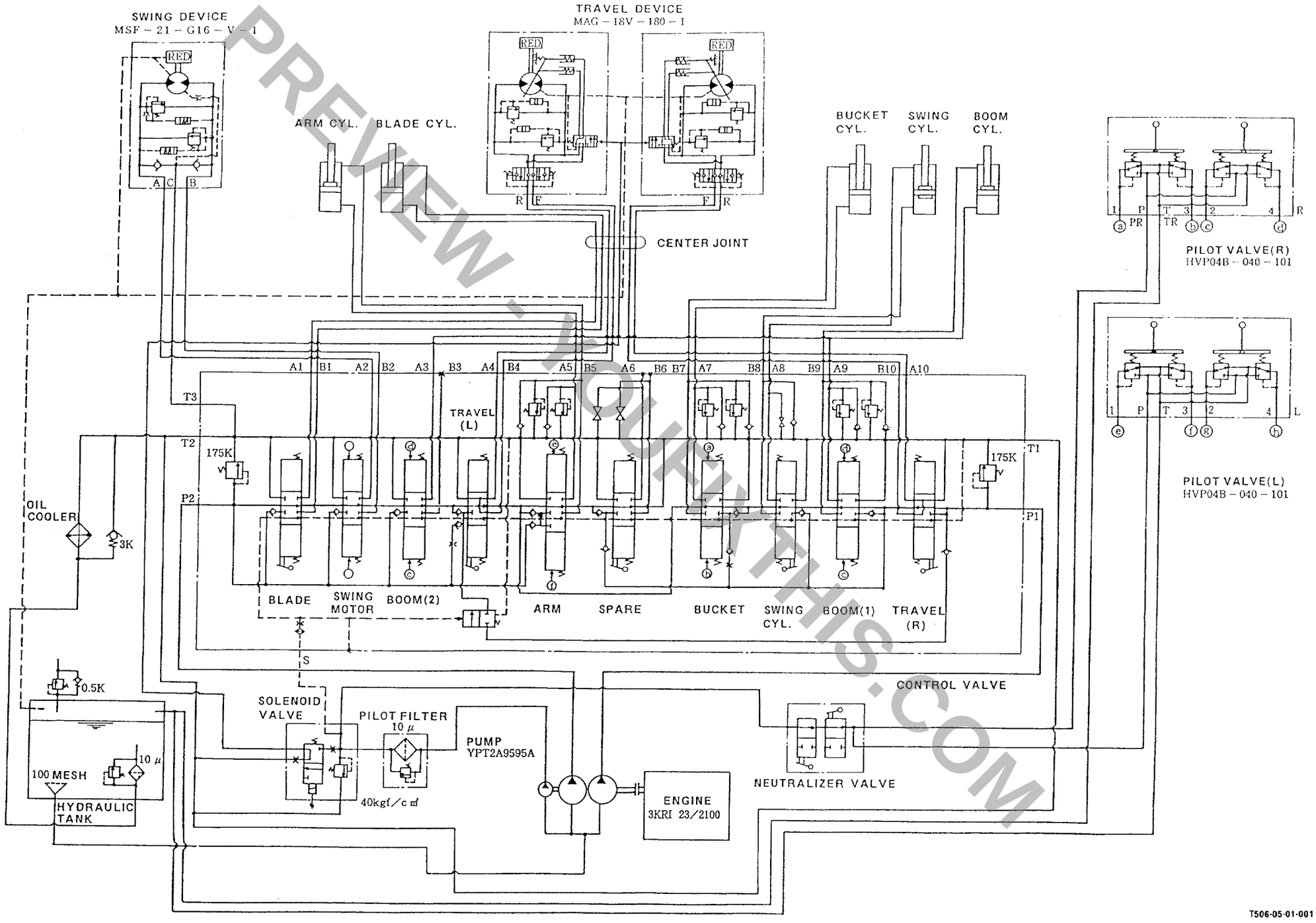
EX25 ELECTRICAL CIRCUIT



T04-01-01

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HYDRAULIC CIRCUIT (EX25)



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INTRODUCTION

Troubleshooting charts shown in this section orderly indicate the procedures how to inspect and locate the causes when some problems occur in machine functions.
Use the chart as a guide to locate causes of malfunctions.



DIAGNOSING PROCEDURE

Follow the five basic steps shown below to carry out troubleshooting efficiently.

1. Know the system

Study the machine technical manuals. Know how the system is composed of and how it works, and what are the construction, functions and specifications of the system components.



T107-07-01-001

2. Ask the operator

Before inspecting, get the full story of malfunctions from a witness--- the operator.

(a) How the machine is used and when it is serviced?
(b) When the trouble was noticed and what work the machine was doing at that time?
(c) What is the phenomenon of the trouble? Was the trouble getting worse, or did it come out suddenly for the first time?
(d) Did the machine have any troubles previously? If so, which parts were repaired before.



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MAINTENANCE

Valve Clearance Measurement (EX25, EX35)

CAUTION: Measure/adjust the valve clearance when the engine is cold. Do not attempt this procedure on a hot engine.

Valve clearance measurement should normally be performed once every 1000 hours. However, if the tappet noise increases or the engine performance decreases, measure and adjust valve clearance regardless of the interval.

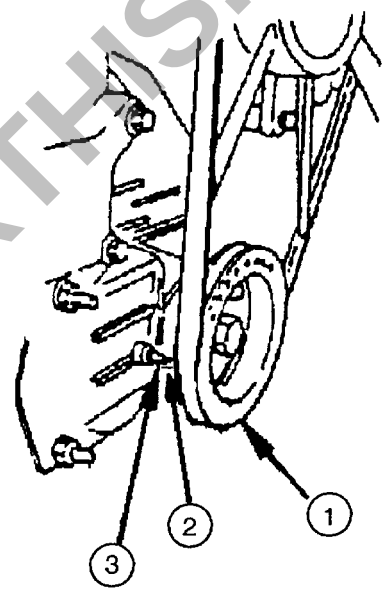
Valve Clearance Standard ····· 0.25mm (Cold engine)

Procedure

(1) Before removing the head cover, clean the area around the head cover to prevent engine contamination.

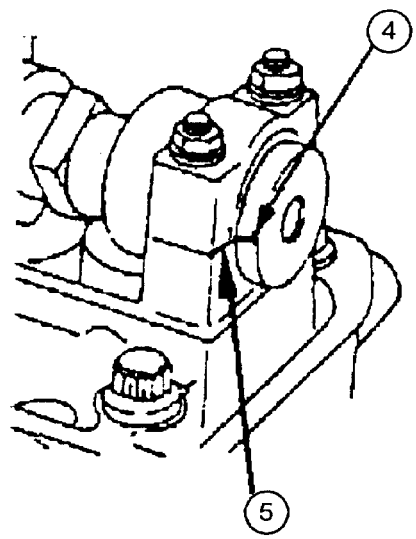
(2) Rotate the crankshaft clockwise by hand to align cylinder No.1 to the top dead center (TDC). Align top mark (2) on crankshaft pulley (1) to pointer (3) on the timing gear case.
If No.1 cylinder without at TDC, turn the crankshaft one full rotation clockwise.

NOTE: The crankshaft can be easily turned when the glow plugs are removed.



T503-02-10-001

(3) Remove the head cover. When timing mark (4) on the rear end on the camshaft is aligned to cam bracket mark (5), No.1 cylinder will be in theTDC position. If the position is incorrect, rotate the crankshaft once more until the top mark on the crankshaft pulley is aligned with the pointer on the timing gear case.



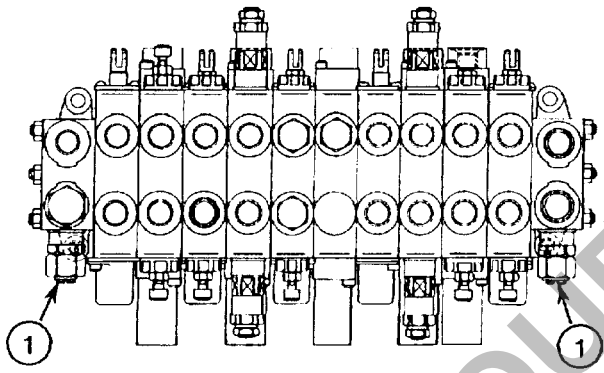
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Evaluation

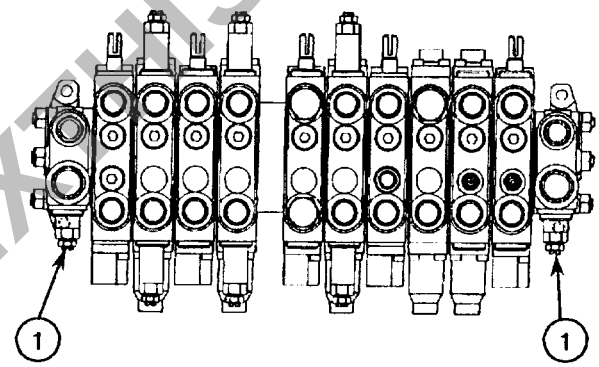
The mean relief pressure should meet the following specifications:

Model	Standard	Allowable limits (kgf/cm2)	Remarks
EX25	185 ± 10	Maximum: 195, Minimum: 150	
EX35	210 ± 10	Maximum: 220, Minimum: 170	
EX40	220 ± 10	Maximum: 230, Minimum: 180	



①Main relief valve

T505-06-04-004



T505-06-04-005

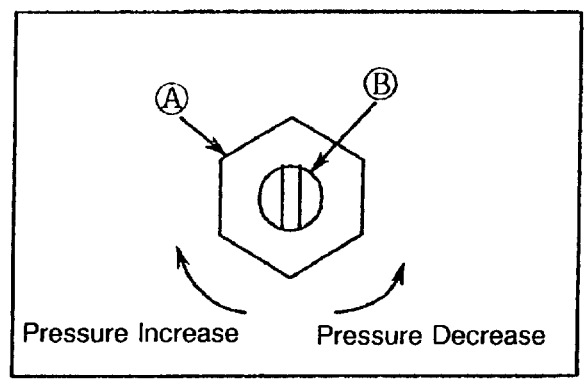
Adjustment:

If the mean pressure is not within specifications, adjust it as follows:

1. Loosen lock nut (A).
2. Turn adjusting screw (B).
3. After adjustment. retighten the lock nut to specification.

Torque Specifications:

EX25: 2 + 0.3 kgf·m
EX35: 2 + 0.4 kgf·m
EX40: 2 + 0.4 kgf·m



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Pressure Variations by Turning Adjusting Screw

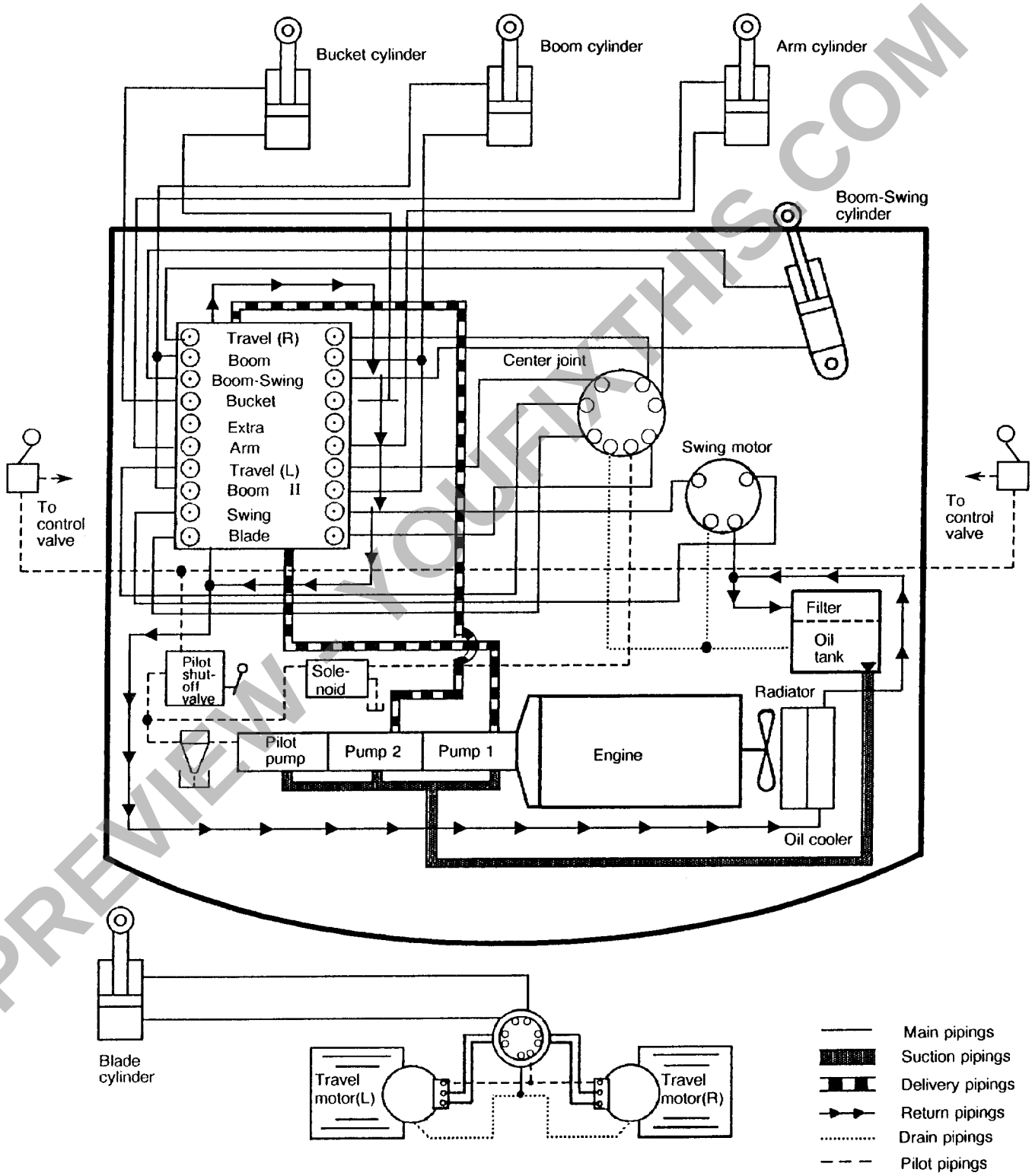
Model	Adjusting Screw Turn	Pressure (kgf/cm2)	Remarks
EX25	1·1/2·1/4 turn	78·39·19.5	
EX35	1·1/2·1/4 turn	110·55·27.5	
EX40	1·1/2·1/4 turn	110·55·27.5	

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GENERAL

Hydraulic oil pipings consists of main pipings and pilot pipings.

★ The circuit diagram shows the pipings in EX25 and EX40.
(EX35 does not have the boom II section.)



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