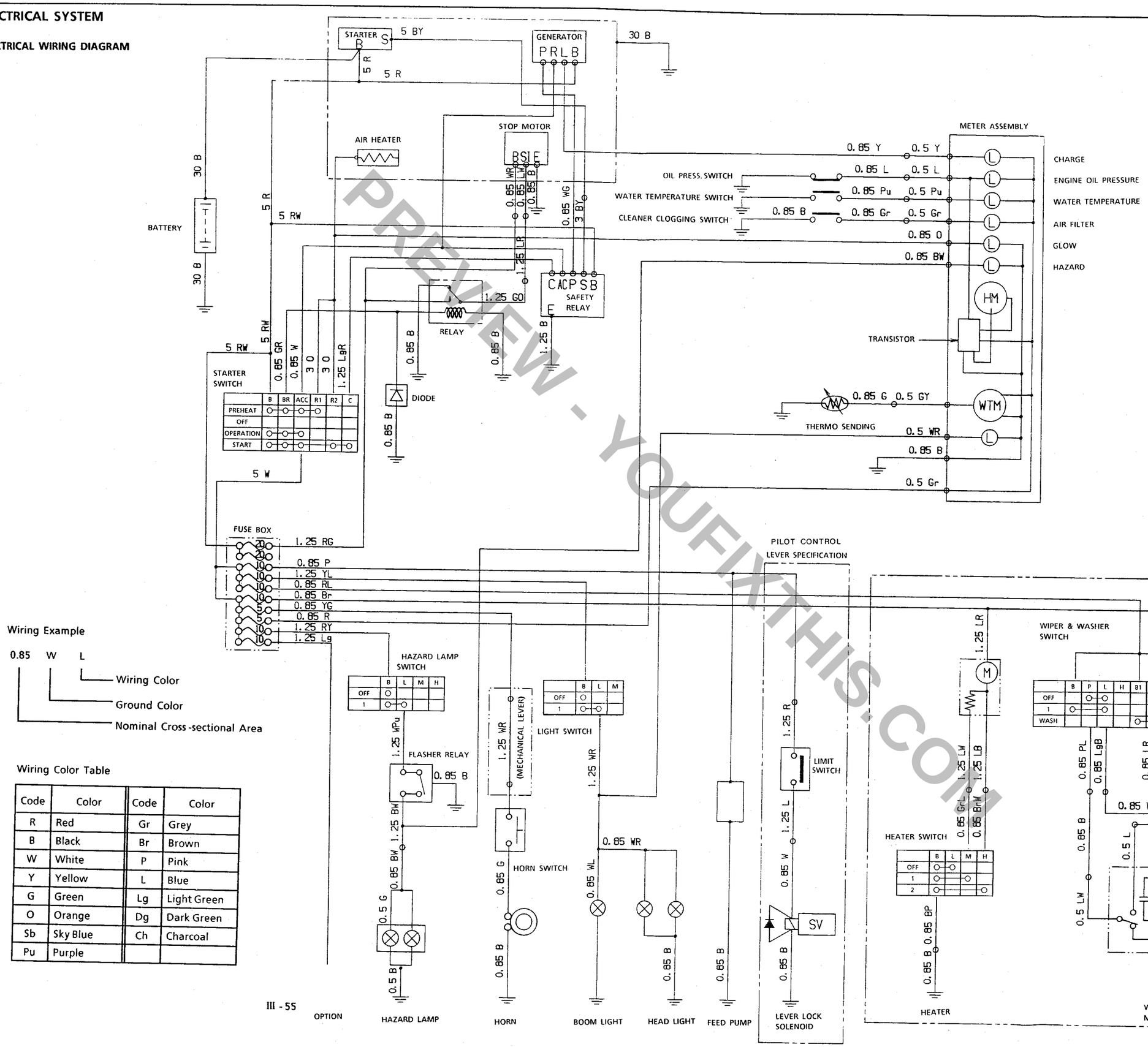
ELECTRICAL SYSTEM

ELECTRICAL WIRING DIAGRAM



Wiring Example

0.85 W L

- L — Wiring Color
- W — Ground Color
- 0.85 — Nominal Cross-sectional Area

Wiring Color Table

Code	Color	Code	Color
R	Red	Gr	Grey
B	Black	Br	Brown
W	White	P	Pink
Y	Yellow	L	Blue
G	Green	Lg	Light Green
O	Orange	Dg	Dark Green
Sb	Sky Blue	Ch	Charcoal
Pu	Purple		

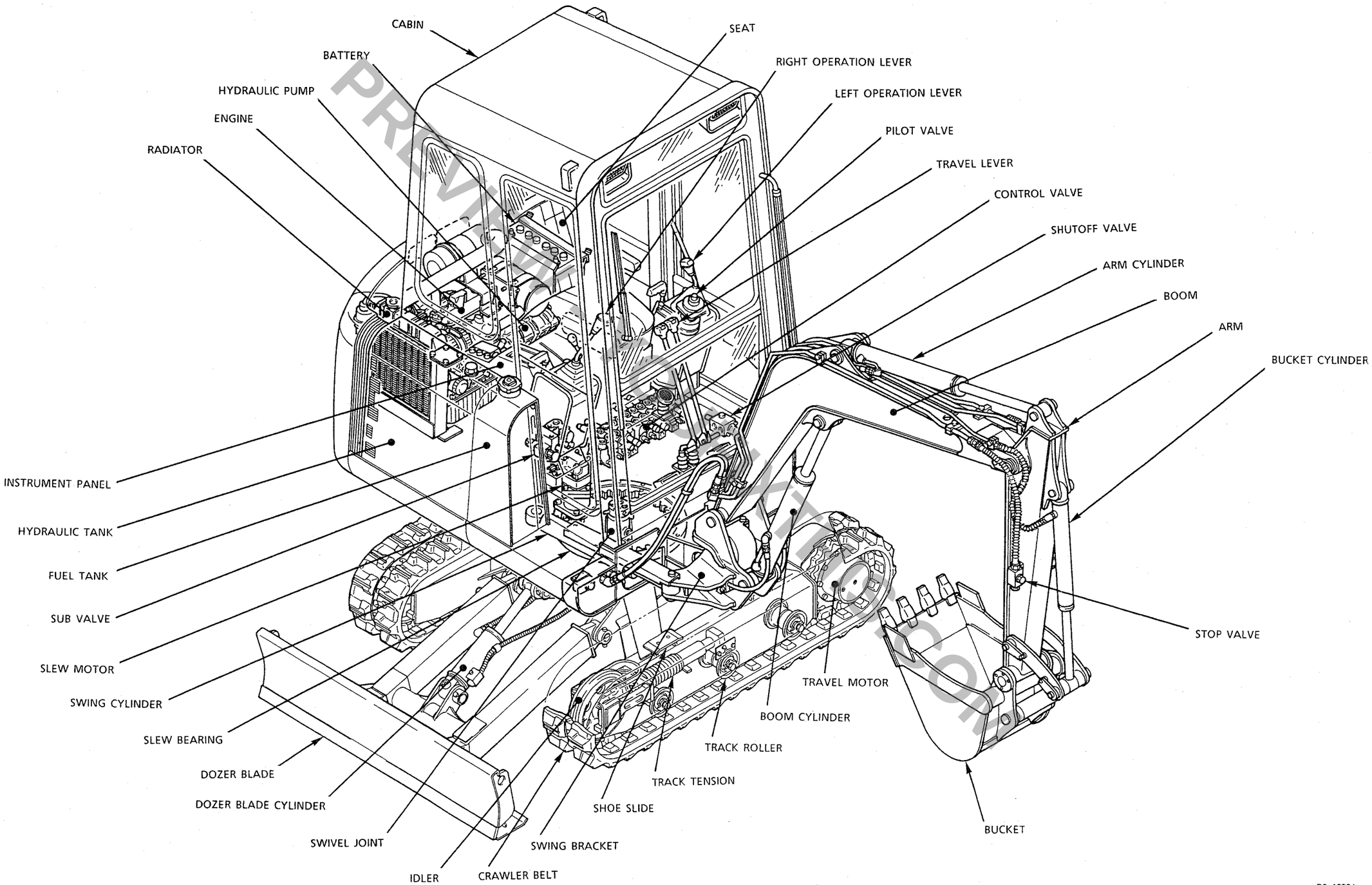
OPTION

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D3-8003

EXTERNAL VIEW



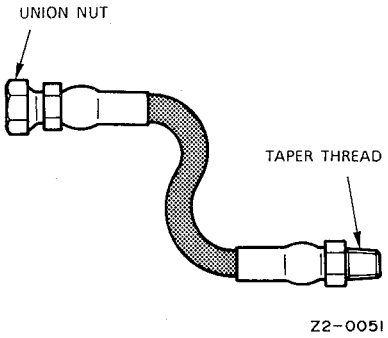
D3–1003A

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TIGHTENING TORQUES

Hydraulic Hoses

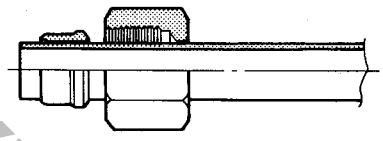
Hose Fitting Size	Torque			
	Union Nut (PF)		Taper Threads (PT)	
	kgf·m	ft-lb	kgf·m	ft-lb
1/8	$1.0^{+0.5}_{0}$	$7.3^{+3.5}_{0}$	$1.2^{\pm 0.12}$	$8.7^{\pm 0.8}$
1/4	$2.5^{+0.5}_{0}$	$18.1^{+3.5}_{0}$	$3.0^{\pm 0.30}$	$21.7^{\pm 2.1}$
3/8	$5.0^{+0.5}_{0}$	$36.2^{+3.5}_{0}$	$5.5^{\pm 0.55}$	$39.8^{\pm 3.9}$
1/2	$6.0^{+0.5}_{0}$	$43.4^{+3.5}_{0}$	$9.0^{\pm 0.90}$	$65.1^{\pm 6.4}$
3/4	$12.0^{+0.5}_{0}$	$86.8^{+3.5}_{0}$	$15.0^{\pm 1.50}$	$108.5^{\pm 10.7}$
1	$14.0^{+0.5}_{0}$	$101.3^{+3.5}_{0}$	$20.0^{\pm 2.00}$	$144.7^{\pm 14.3}$



Z2-0051

Bite Type Pipe Fitting For Steel Pipe

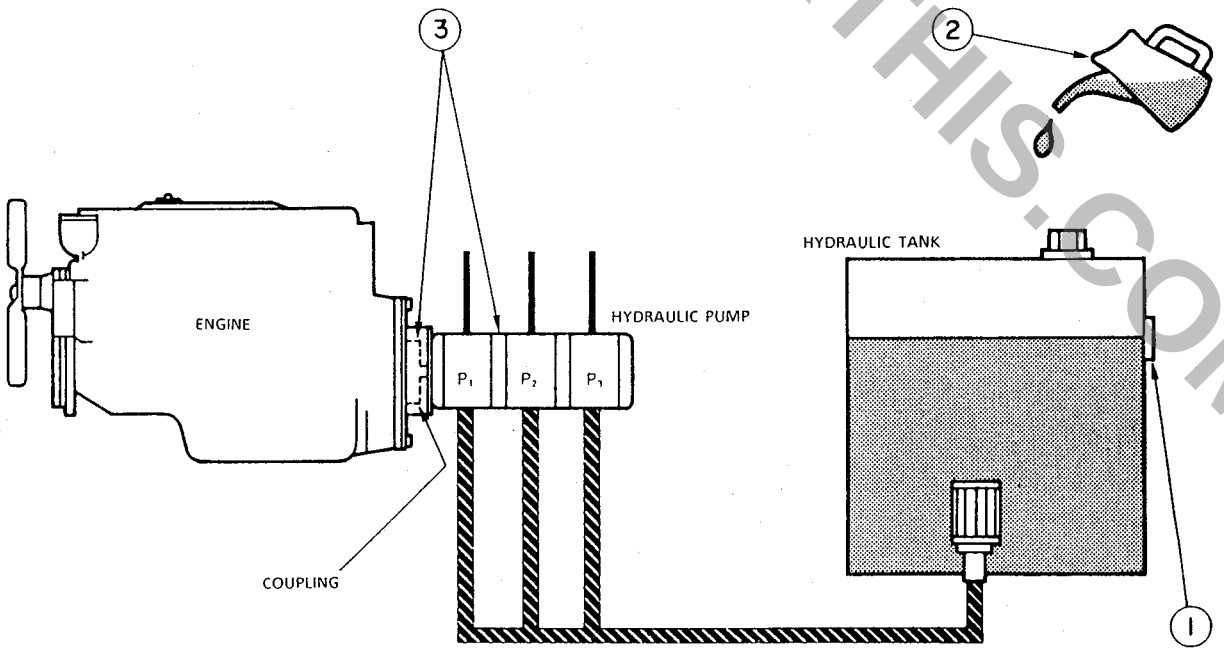
Pipe Outer Diameter (mm)	Torque	
	kgf·m	ft-lb
8	$3.5^{\pm 0.5}$	$25.3^{\pm 3.5}$
10	$4.25^{\pm 0.25}$	$30.7^{\pm 1.7}$
12	$6.0^{\pm 0.5}$	$43.4^{\pm 3.5}$
15	$9.0^{\pm 0.5}$	$65.1^{\pm 3.5}$
16	$9.5^{\pm 0.5}$	$68.7^{\pm 3.5}$
18	$13.5^{\pm 0.5}$	$97.6^{\pm 3.5}$
22	$21.0^{\pm 1.0}$	$151.8^{\pm 7.2}$
27.2	$25.0^{\pm 1.0}$	$181.0^{\pm 7.2}$
28	$32.0^{\pm 2.0}$	$231.4^{\pm 14.3}$
32	$32.0^{\pm 2.0}$	$231.4^{\pm 14.3}$
35	$42.0^{\pm 2.0}$	$303.7^{\pm 14.3}$


Z2-0061

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NO OPERATIONS CAN BE DONE.

1	Inspect the hydraulic oil level.	Insufficient →	2	Replenish the hydraulic oil.
↓ Proper Amount				
3	Hydraulic pump or coupling is faulty.	→		• Repair the pump or replace the pump. • Replace the coupling.



Z3-1015

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SPECIFICATIONS

SPECIFICATIONS

Serial Number		1203001~	
Type		Rubber Crawler	Steel Crawler
Standard Bucket Capacity (SAE Rated)	$m^3(yd^3)$	0.057 (0.075)	←
Weight in Transport Condition	kg(lb)	2030 (4480)[1940 (4280)] 2040 (4490)[1950 (4290)] *	2150 (4740) [2060(4540)] 2160 (4750) [2070(4550)]*
Dimensions	mm(in)		
Overall Length		4050 (159.4)	←
Overall Width		1310 (51.6)	←
Overall Height		2420 (95.2)[2370 (93.3)]	←
Minimum Ground Clearance		300 (11.8)	←
Minimum Height of Upper Machinery		550 (21.7)	←
Overall Width of Upper Machinery		1250 (49.2)	←
Overall Width of Crawler		1310 (51.6)	1300 (51.2)
Overall Length of Crawler		1775 (69.9)	1740 (68.4)
Minimum Slew Radius		1565 (61.6)	←
Maximum Height of Hoe at Minimum Slew Radius		3105 (122.3)	←
Tail Swing Radius		1225 (48.2)	←
Dozer Blade Width		1310 (51.6)	←
Dozer Blade Height		330 (13)	←
Working Range	mm(in)		
Maximum Digging Height		3965 (156.1)	←
Maximum Digging Depth		2320 (91.3)	←
Vertical Digging Depth		1820 (71.6)	←
Maximum Digging Reach		4155 (163.6)	←
Maximum Reach at Ground		4045 (159.3)	4040 (159.1)
Maximum Dumping Height		2805 (110.5)	←
Bucket Offset : Right/Left		555 (21.9)/470 (18.5)	←
Dozer Blade Lift : Above/ Below ground		385 (15.1)/260 (10.3)	←
Performance			
Digging Force : Arm/Bucket	kg(lb)	1100 (2425)/1500 (3307)	←
Slew Speed	rpm	10	←
Travel Speed	km/h(mph)	Low2.4(1.47)/High 4.3(2.65)	Low2.2(1.37)/High 4.0(2.50)
Traction Force	kg(lb)	2210 (4860)	←
Gradeability	deg	30	←
Ground Pressure (JIS)	$kgf/cm^2(psi)$	0.27 (3.84)[0.26(3.70)]	0.30 (4.33)[0.29 (4.12)]

Values in [ ] are for models with canopy specifications.

Values with the * mark are for Northern Europe specification models.

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[6] MAINTENANCE CHECK LIST

To maintain long-lasting and safe engine performance, make it a rule to carry out regular inspections by following the table below.

Item	Service Interval								
	Every 50 hrs	Every 100 hrs	Every 150 hrs	Every 400 hrs	Every 800 hrs	Every 1000 hrs	Every three months	Every one year	Every two years
Checking fuel pipes and clamps	O								
Changing engine oil *		O							
Cleaning air filter element		O							
Cleaning fuel filter		O							
Checking fan belt tension and damage		O							
Checking water pipes and clamps			O						
Changing oil filter cartridge			O						
Changing fuel filter element				O					
Cleaning radiator interior				O					
Changing radiator cleaner and coolant							O		
Changing air filter element								O	
Checking valve clearance					O				
Checking nozzle injection pressure						O			
Changing water pipes and clamps									O
Changing fuel pipes and clamps									O

* Change engine oil after the first 50 hours of operation.

CAUTION

- When changing or inspecting, be sure to level and stop the engine.

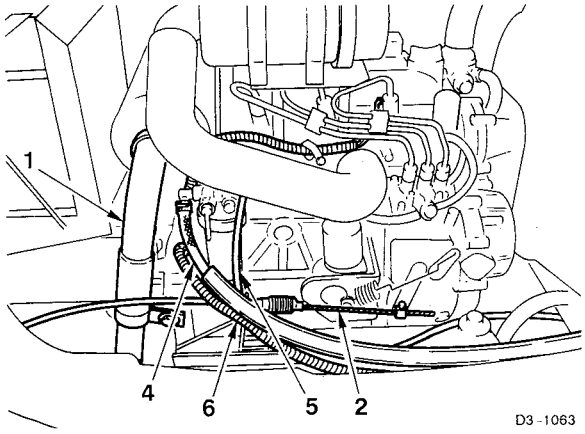
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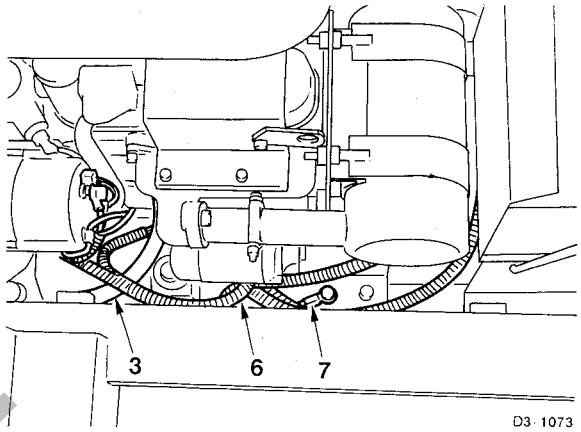
DISASSEMBLY AND ASSEMBLY

Removing the Engine

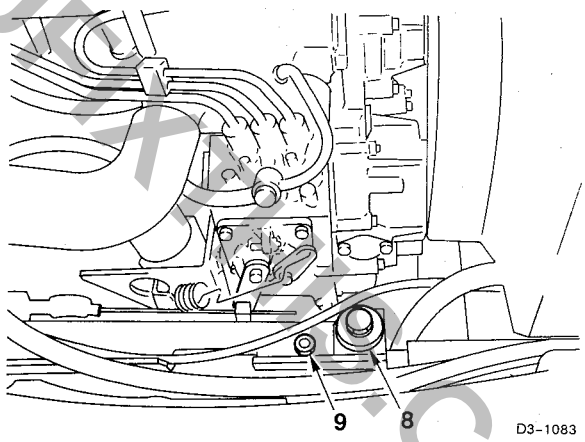
1. Remove the bonnet and the side covers (R), (L).
   • Refer to the item "Removing the Covers".
2. Remove the radiator.
   • Refer to the item "Radiator".
3. Remove the battery and hydraulic pump.
   • Refer to the item "Removing the Hydraulic Pump"
4. Remove the exhaust pipe (1)
5. Disconnect the accelerator wire (2) from the engine.
6. Disconnect the coolant drain hose (3).
7. Disconnect the fuel pipes (4), (5) from the engine.
8. Disconnect the electrical wiring (6) from the engine.
   • Attach labels to each wire to identify them.
9. Disconnect the engine ground cable (7).
10. Remove the stoppers (8).
11. Remove the cushion rubber installation nuts (9), then remove the engine assembly.
    • Engine Unit Weight : Approx. 126 kg



D3-1063



D3-1073



D3-1083

Installing the Engine

Follow the procedure used for removal in reverse order.

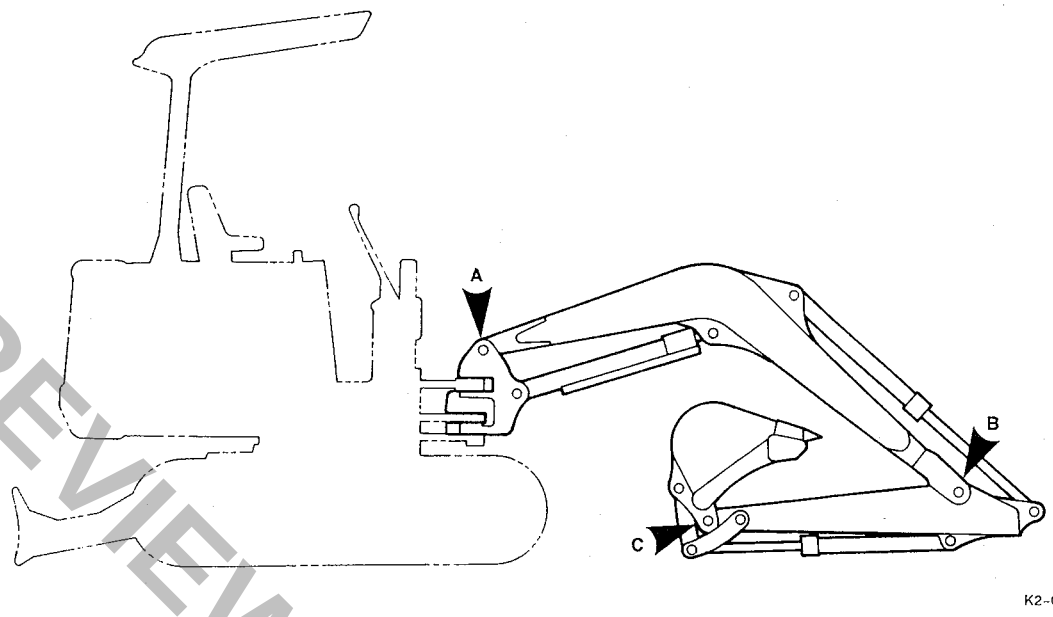
• Cushion Rubber Installation Nut Tightening Torque : 5.6 kgfm

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Axial Clearances for Boom, Arm and Bucket

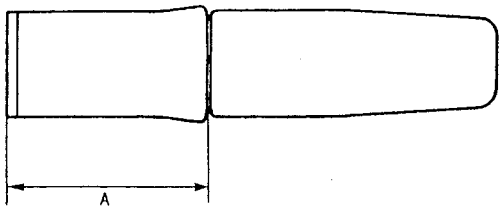


K2-0042

Unit : mm

Code	Item	Designated Standard		Servicing Procedure
		Basic Dimension	Allowable Value	
A	Side of Boom Foot	0.2~1.4	2.5	Adjust shim
B	Side of Arm Cente	0.2~1.4	2.5	
C	Side of Arm Point	0.7~1.4	2.5	Adjust

Tooth (Point)



Z2-0812

Unit : mm

Code	Item	Designated Standard		Servicing Procedure
		Basic Dimension	Allowable Value	
A	Wear on Point	100	50	Replace.
	Damage to Point	Even though small, if hole develops		

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DISASSEMBLY AND ASSEMBLY

Removing the Upper Frame

1. Remove the hoe attachment.
   • Refer to the item "Attachnents, Disassembly and Assembly".

2. Remove the canopy or the cabin.
   • Refer to the item "Removing the Cabin".

3. Remove the hood and the side covers [R], [L].
   • Refer to the item "Removing the Covers".

4. Remove the floor plate [M].

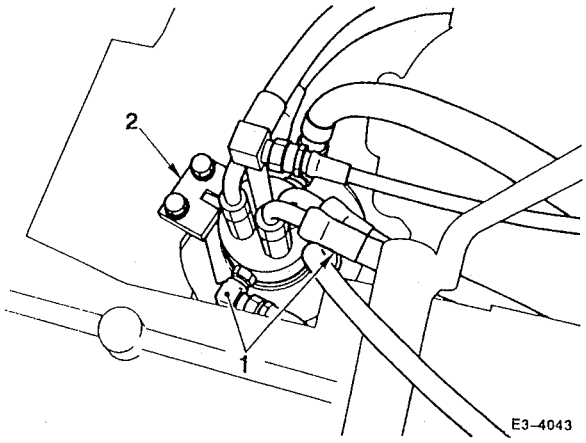
5. Disconnect the swivel joint shaft side piping (1).
   • Make match marks on the installation position of the hoses before disconnecting them.

6. Remove the swivel joint stopper (2).

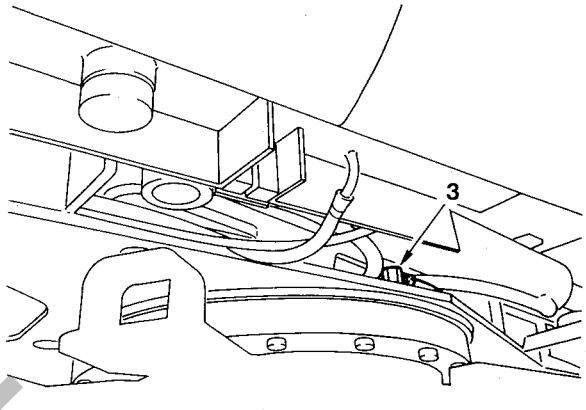
7. Disconnect the grease pipe (3) from the slew bearing.

8. Leaving 2 bolts each on the front and rear, take out the installation bolts (5) from the outer race of the slew bearing (4).
   • Operate the slew lever and remove the installation bolts as the upper frame is being turned.

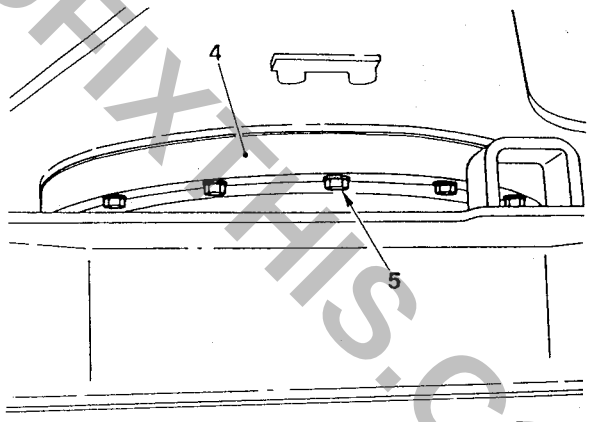
9. Suspend the upper frame and remove it.
   • After suspending the upper frame temporarily, take out the remaining bolts, making sure that it is well balanced.



E3-4043



D3-4033

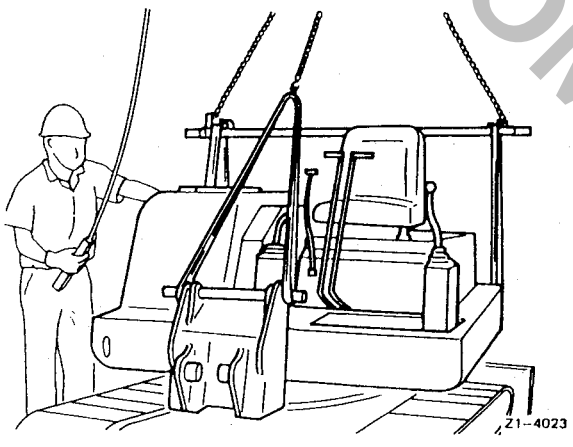


E3-4063

Installing the Upper Frame

Follow the procedure used for removal in reverse order.

- Apply molybdenum disulfide grease to the threads and bearing surface of the slew bearing outer race installation bolts.
- Slew Bearing Installation Bolt Tightening Torque:
  Outer Race; $10.4^{\pm 0.5}$kgfm


Z1-4023

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DISASSEMBLY AND ASSEMBLY

General Cautions

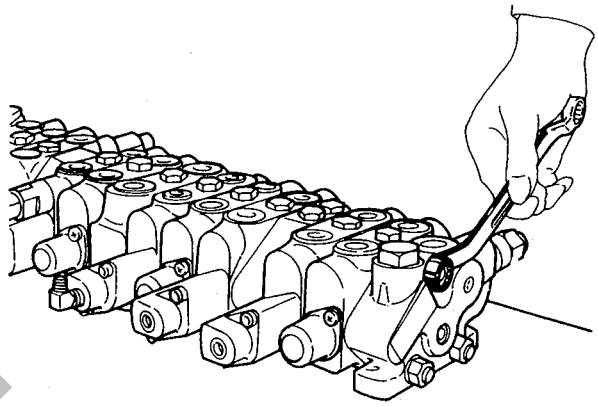
- Since all parts in control valves are precision machined, carry out disassembly and assembly operations in a clean place.
- Before disassembly, clean the outside surfaces around the valves.
- Clean each of the disassembled parts and apply clean hydraulic oil to them.
- Apply hydraulic oil to sliding surfaces and apply a thin coating of grease to seals when assembling them.
- Replace all seals with new ones each time the valves are disassembled.
- Spools and section bodies are specially selected for a precise fit. Therefore, if any damage is found in either of these parts, replace the section assembly as a unit.
- Be sure to number each section and spool to avoid mistakes during assembly.

Following is an explanation of the control valve disassembly procedure.
Follow the procedure used to disassemble the control valve in reverse order when reassembling it.

- Before disassembly, number each section and spool.

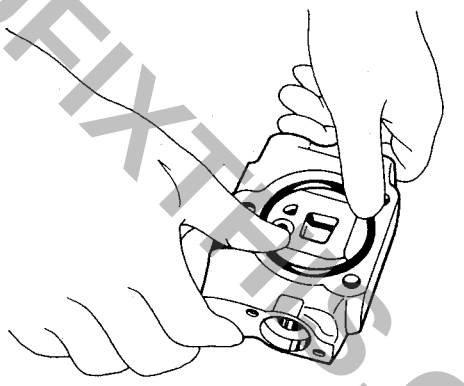
Disassembling the Valve Assembly

1. Loosen the nut and remove the tie rod, then remove the section.
   - Nut Tightening Torque : 2 kgfm



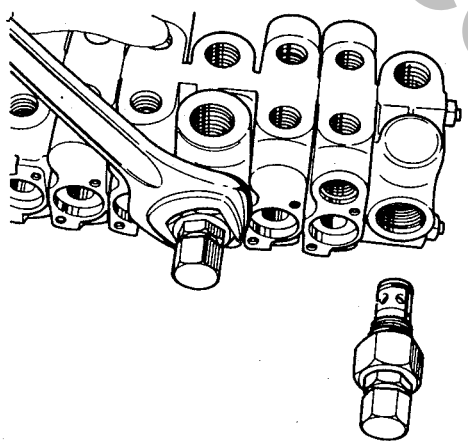
GI-0201

2. Remove the O-ring from the block mating surface.
   - Since the mating surface forms a metal seal, be careful not let this surface become scratched, bruised or otherwise damaged.



Z2-3114

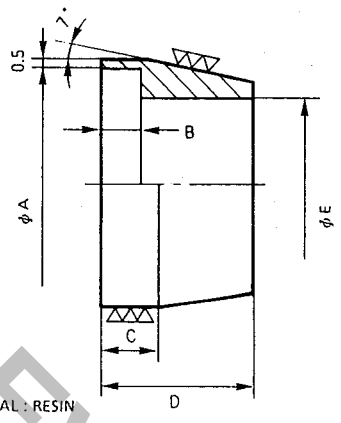
3. Remove the main relief valve, port relief valve and anti-cavitation valve, then remove the O-rings from the valves.
   - Take care not to loosen the lock nuts on the main relief valve and port relief valve, or to let the set screws turn.
   - If the port relief valve is completely disassembled, it cannot be adjusted after reassembly, so do not disassemble it.
   - Housing Tightening Torque : 6.5 kgfm



Z2-3154

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Sliding Jig (C)



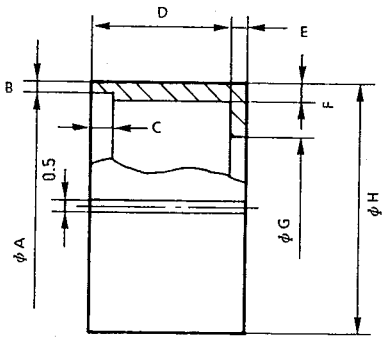
MATERIAL : RESIN

Z1–4124

Units : mm

Boom Cylinder	A	64.4
	B	18.7
	C	23.7
	D	63.7
	E	34.4
Arm Cylinder	A	62.4
	B	18.7
	C	23.7
	D	63.7
	E	32.4
Bucket Cylinder	A	54.4
	B	15.3
	C	20.3
	D	60.3
	E	24.4
Dozer Blade Cylinder	A	79.4
	B	23.5
	C	28.5
	D	68.5
	E	49.4
Swing Cylinder	A	69.4
	B	23.5
	C	28.5
	D	68.5
	E	39.4

Fitting Jig (D)



MATERIAL : RESIN

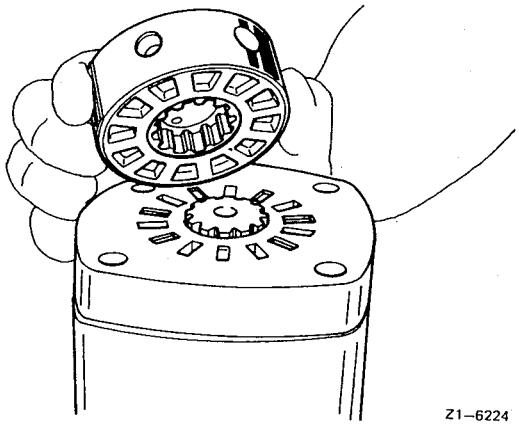
Z1–4114

Units : mm

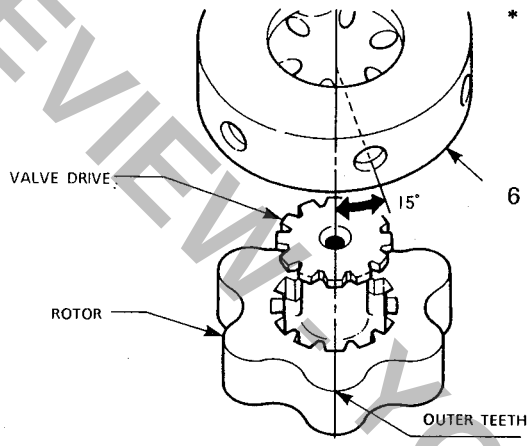
Boom Cylinder	A	64.4
	B	1.0
	C	6.8
	D	75.0
	E	3.4
	F	3.4
	G	44.4
	H	66.4
Arm Cylinder	A	62.4
	B	1.0
	C	6.8
	D	75.0
	E	3.4
	F	3.4
	G	42.4
	H	64.4
Bucket Cylinder	A	54.4
	B	1.0
	C	6.8
	D	80.9
	E	2.9
	F	2.9
	G	34.4
	H	56.4
Dozer Blade Cylinder	A	79.4
	B	1.0
	C	6.8
	D	79.8
	E	3.4
	F	3.4
	G	59.4
	H	81.4
Swing Cylinder	A	69.4
	B	1.0
	C	6.8
	D	79.8
	E	3.4
	F	3.4
	G	49.4
	H	71.4

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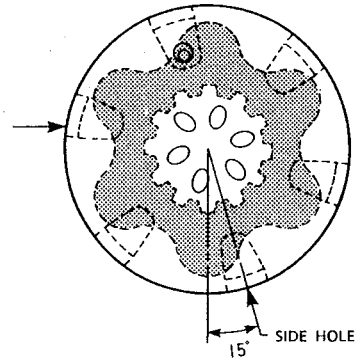
9. Assemble the valve (6).
Valve timing is important in determining the motor's direction or rotation. Assemble the valve with utmost care, referring to the following figure.



Z1–6224

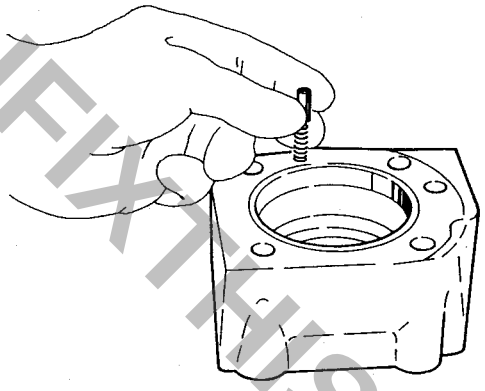


* The rotor's outer teeth and the valve's side hole should deviate from each other by 15°.



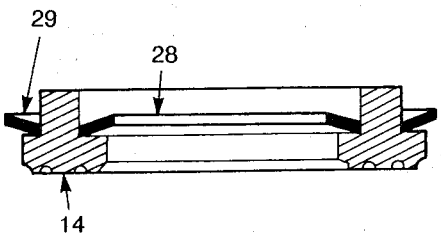
B2-102A

10. Install the O-rings [large, small] in the valve housing. Next, install the springs and pins for the balancing plate.

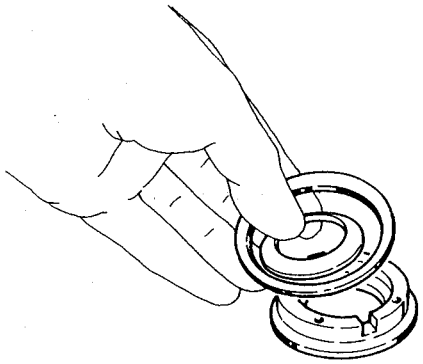


B2-178A

11. Install the inner face seal (28) and outer face seal (29).
- Be careful not to damage the seal inner and outer surfaces.



B2-106A



B2-179A

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MACHINE WON'T ACCELERATE DURING TRAVEL.

Is 1st gear travel normal?

Normal

1 Inspect the accel. pedal. — Faulty → Repair or replace the accel. pedal

Normal

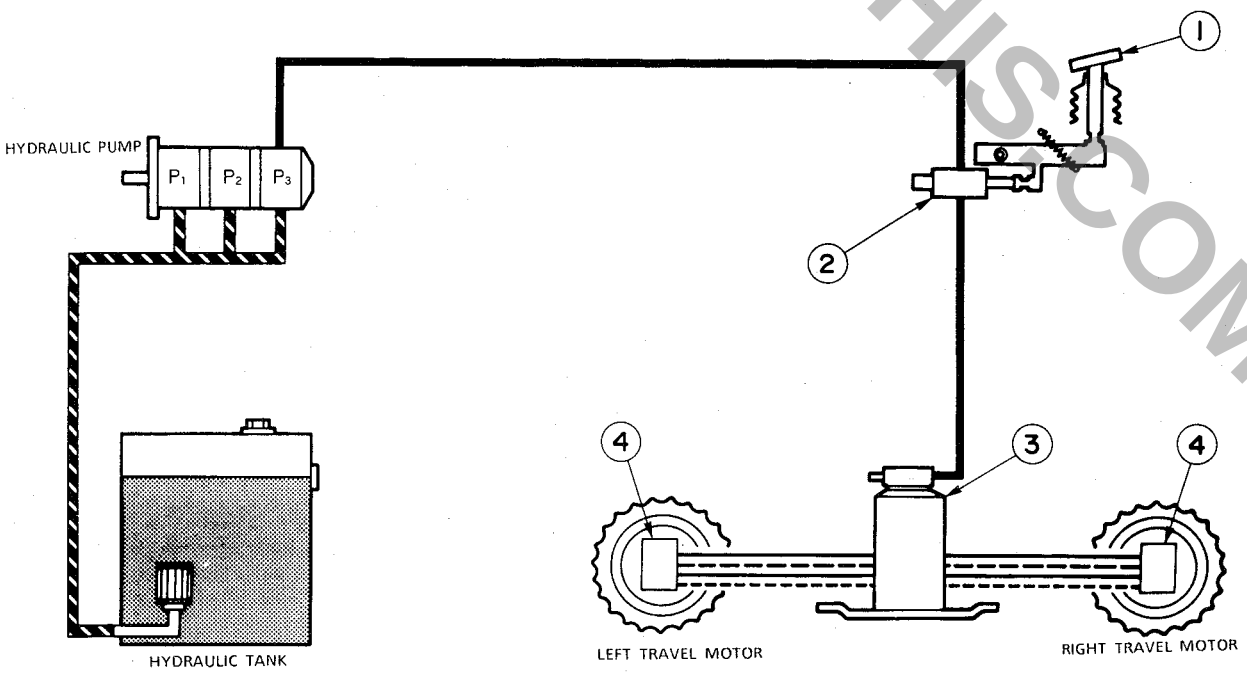
2 Inspect the shutoff valve. — Faulty → Replace the shutoff valve.

Normal

3 Inspect the swivel joint. — Faulty → Repair or replace the swivel joint.

Normal

4 Inspect the 2-speed control valve. — Faulty → Repair or replace the 2-speed control valve.



D3-2045

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CARACTERISTIQUES

Modèle		D1105-B	V1505-B
Nombre de cylindres		3	4
Type		Vertical, à refroidissement par eau, 4 temps, Diesel	
Alésage x course		78 x 78,4 mm	78 x 78,4 mm
Cylindrée totale		1123 cm³	1498 cm³
Puissance aux freins	Puissance continue SAE, Net kW/tr/mn (HP/tr/mn)	16,4/3000 (22,0/3000)	21,6/3000 (29,0/3000)
	Puissance intermittente SAE, Net kW/tr/mn (HP/tr/mn)	18,7/3000 (25,0/3000)	25,0/3000 (33,5/3000)
	Puissance intermittente SAE, brut kW/tr/mn (HP/tr/mn)	20,9/3000 (28,0/30000)	28,0/3000 (37,5/3000)
	DIN6271-NA kW/tr/mn (CV/tr/mn)	16,2/3000 (22,0/3000)	21,3/3000 (29,0/3000)
	DIN6271-NB kW/tr/mn (CV/tr/mn)	17,6/3000 (24,0/3000)	23,5/3000 (32,5/3000)
	DIN70020 kW/tr/mn (CV/tr/mn)	19,5/3000 (26,5/3000)	26,1/3000 (35,5/3000)
Régime maximum à vide tr/mn		3200	
Régime minimum à vide tr/mn		600	
Couple maximum N·m/tr/mn (kgf·m/tr/mn)		67,3/2000 6,86/2000	90,2/2000 9,20/2000
Chambre de combustion		Sphérique (Nouveau TVCS)	
Pompe d'injection		Bosch MD Type Mini	
Régulateur		Mécanique centrifuge	
Sens de rotation		En sens inverse des aiguilles d'une montre (en regardant côté volant)	
Injecteurs		Injecteurs Mini (DNOPD)	
Calage de l'injection		11 à 23° (0,19 à 0,40 rad.) avant PMH	
Order d'injection		1 – 2 – 3	1 – 3 – 4 – 2
Pression d'injection		13,73 MPa (140 kgf/cm²)	
Taux de compression		22:1	
Lubrification		Forcée, par pompe	
Indication de pression d'huile		Par contact électrique	
Filtre de lubrification		Filtre à élément papier (à type cartouche)	
Refroidissement		Radiateur sous pression, circulation forcée avec pompe à eau (non compris dans le moteur de base)	
Démarrage		Démarrage électrique avec démarreur	
		12 V, 1,0 kW	12 V, 1,2 kW
Dispositif auxiliaire au démarrage		Par bougie de préchauffage, dans la chambre de combustion	
Alternateur		12V, 65AH, ou équivalent	12V, 70AH, ou équivalent
Circuit de charge		12 V, 360 W	
Carburant		Gas-oil N° 2–D (ASTM D975)	
Huile de lubrification		MIL-L-46152, MIL-L-2104C, qualité supérieure à la classe CC (API)	
Capacité en huile de lubrification		5,1 ℓ	6,0 ℓ
Poids (à sec)		89,0 kg	106,0 kg

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S. DISASSEMBLING AND SERVICING
DEMONTAGE ET ENTRETIEN
AUSBAU UND WARTUNG

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Nettoyage de l'élément du filtre à air

- En cas d'adhésion de poussières séches
  Insuffler de l'air comprimé sec et propre vers l'intérieur de l'élément.
  La pression d'air à la buse ne doit pas excéder 690 kPa (7 kgf/cm², 6,9 bar).
  Maintenir une distance adéquate entre la buse et le filtre.

Reinigung des Luftfiltereinsatzes

- Wentrockener Staub anhaftet
  Den Einsatz aus der Innenseite mit reiner Druckluft durchblasen.
  Der Luftdruck an der Düse darf 690 kPa (7 kp/cm², 6,9 bar) nicht überschreiten.
  Einen angemessenen Abstand zwischen der Düse und dem Filter aufrechterhalten.

(4) Point de verification de toutes les 800 heures

Verification du jeu des soupapes

■ IMPORTANT
- **Le jeu des soupape doit être et réglé suivant les besoins avec le moteur froid.**

1. Déposer le couvre-culasse.
2. Measurer le jeu au calibre après avoir aligné chaque cylindre sur le haut de course.
3. Si le jeu n'est pas compris dans la gamme de valeurs de référence, régler à l'aide de la vis de réglage.

■ NOTA
- Après avoir tourné le volant dans le sens inverse des aiguilles d'une montre à deux ou trois reprises, vérifier à nouveau le jeu de soupape.
- Après avoir réglé le jeu de soupape, serrer fermement le contre-écrou de vis de réglage.

(1) Partie entaillée
(2) Repère TC
(3) Jeu aux soupapes

(4) Überprüfungspunkte nach allen 800 Stunden

Überprüfung des Ventilspieles

■ WICHTIG
- **Das Ventilspiel bei kaltem Motor gemessen und eingestellt werden.**

1. Entfernen Sie die Zylinderkopfverkleidung.
2. Nach Abgleich jedes Zylinders auf obere Kompressionsmittelstellung, die Abstände mit einem Abstandsmesser ausmessen.
3. Das Spiel mit der Stellschraube berichtigen wenn es nicht innerhalb der vorgeschriebenen Werkdaten ist.

■ ANMERKUNG
- **Das Schwungrad zweimal oder dreimal entgegen dem Uhrzeigerlauf drehen und das Ventilspiel nachprüfen.**
- **Nach Einstellung des Ventilspiels, die Sicherungsmutter der Stellschraube festziehen.**

(1) Eingekerbten Teil
(2) TC- Markierung
(3) Vantilspiel

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[2] PIGNON DE DISTRIBUTION ET ARBRE A CAMES

Jeu d'engrènement de pignon de distribution

1. Disposer un comparateur à cadran (modèle à levier) et sa lèvre sur la dent de pignon.
2. Faire tourner le pignon pour mesurer le battement tout en immobilisant le pignon correspondant.
3. Vérifier le jeu de gaissage des arbres et du pignon si le battement excède la tolérance.
4. Remplacer le pignon si le jeu de graissage est correct.

Jeu latéral de l'pignon 1,2 de renvoi

1. Mesurer le jeu entre commande de pignon de renvoi et collier de pignon de renvoi.
2. Remplacer la collier de pignon de renvoi si le jeu excède la tolérance.

Jeu latéral de l'arbre à cames

1. Tirer la commande de cames solidaire de l'arbre à cames jusqu'à son extrémité.
2. Mesurer le jeu entre commande de cames et butée d'arbre à cames.
3. Remplacer la butée d'arbre à cames si le jeu excède la tolérance.

Alignement de l'arbre à cames

1. Supporter l'arbre à cames avec des blocs trapézoïdaux sur le plateau de dressage et mettre un comparateur à cadran de telle facon que son extrémité soit perpendiculaire au tourillon intermédiaire.
2. Tourner l'arbre à cames sur les blocs trapézoïdaux et obtenir le désalignement (moitié de la valeur mesurée).
3. Si le désalignement excède la limite de service, remplacer l'arbre à cames.

[2] STEUERUNG UND NOCKENWELLE

Spiel der Steuerung

1. Eine Meßuhr (Hebeltyp) mit der Spitze an einem Zahn ansetzen.
2. Das Zahnrad bewegen, während die daran sitzenden Zahnräder festgehalten werden.
3. Falls der zulässige Grenzwert überstiegen wird, die Ölabstände der Wellen und Zahnräder messen.
4. Falls der Ölabstand korrekt ist, das Zahnrad austauschen.

Endspiel der Leerlaufgetriebe 1, 2

1. Den Abstand zwischen Leerlaufgetriebe und leerlaufmanschette messen.
2. Falls der Abstand den zulässigen Grenzwsert übersteig, den leerlaufmanschette austauschen.

Endspiel der Nockenwelle

1. Das Nockenwellenrad mit der Nockenwelle bis zum Anschlag herausziehen.
2. Den Abstand zwischen Nockenwellenrad und Nockenwellenanschlag messen.
3. Falls der Abstand den zulässigen Grenzwert übersteigt, den Nockenwellenanschlag austauschen.

Nockenwellenausrichtung

1. Die Nockenwelle mit V-Blöcken auf der Richtplatte abstützen und eine Meßuhr mit der Spitze lotrecht auf den Zwischenzapfen ansetzen.
2. Die Nockenwelle auf den V-Blöcken drehen, um eine Versetzung (Hälfte des Messungswertes) zu erhalten.
3. Überschreitet die Versetzung den zulässigen Grenzwert die Nockenwelle auswechseln.

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