CEBM018903

SHOP MANUAL

WB142-5

BACKHOE LOADER

SERIAL NUMBERS **WB142-5** **A13001** and UP

ENGINE **4D102LE-2**

It is our policy to improve our products whenever it is possible and practical to do so. We reserve the right to make changes or add improvements at any time without incurring any obligation to install such changes on products sold previously.

Due to this continuous program of research and development, periodic revisions may be made to this publication. It is recommended that customers contact their distributor for information on the latest revision.

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SAFETY

SAFETY NOTICE

IMPORTANT SAFETY NOTICE

Proper service and repair is extremely important for the safe operation of your machine. The service and repair procedures recommended and described in this manual are both effective and safe methods of operation. Some of these operations require the use of tools specially designed for the procedure.

To prevent injury to workers, the symbol ⚠ is used to mark safety precautions in this manual. The cautions accompanying this symbol should always be followed carefully. If any dangerous situation arises or may possibly arise, first consider safety, and take the necessary actions to deal with the situation.

GENERAL PRECAUTIONS

Mistakes in operation are extremely costly and dangerous. Read the OPERATION & MAINTENANCE MANUAL carefully BEFORE operating the machine.

1. Before carrying out any greasing or repairs, read all the precautions given on the decals attached to the machine.

2. When carrying out any operation, always wear proper safety equipment specified for the operation you are performing. Do not wear loose fitting work clothes, or clothes with buttons missing.
   - Always wear safety glasses when striking parts with a hammer.
   - Always wear safety glasses when grinding parts with a grinder, etc.

3. If welding repairs are needed, always have a trained, experienced welder carry out the work. When carrying out welding operations, always wear welding gloves, apron, glasses, cap and other clothes suited for welding work.

   ⚠ **WARNING!** Never modify, weld, cut, or drill on any part of a ROPS structure. Doing so may weaken the structure which could lead to possible failure in a rollover situation

4. When carrying out any operation with two or more workers, always agree on the operating procedure before starting. Always inform your fellow workers before starting any step of the operation. Before starting work, lock and tag all controls in the operator's compartment.

5. Keep all tools in good condition.

6. Designate a place in the repair workshop to keep tools and removed parts. Always keep the tools and parts in their correct places. Always keep the work area clean and make sure there is no dirt or oil on the floor. Smoke only in the areas provided for smoking. Never smoke while working.

PREPARATIONS FOR WORK

1. Before adding oil or making repairs, park the machine on hard, level ground and block the wheels or tracks to prevent the machine from moving. Lower all work implements to the ground and remove starting key.

2. Before starting work, lower blade, ripper, bucket or any other work equipment to the ground. If this is not possible, insert the safety pin or use blocks to prevent the work equipment from falling. In addition, be sure to lock all the control levers and hang warning signs on them.

3. When disassembling or assembling, support the machine with blocks, jacks or stands before starting work.

4. Remove all mud and oil from the steps or other places used to get on and off the machine. Always use the handrails, ladders or steps when getting on or off the machine. Never jump on or off the machine. If it is impossible to use the handrails, ladders or steps, use a stand to provide safe footing.

PRECAUTIONS DURING WORK

1. When removing the oil filler cap, drain plug or hydraulic pressure measuring plugs, loosen them slowly to prevent the oil from spurting out. Before disconnecting or removing components of the oil, coolant or air circuits, first relieve the pressure completely from the circuit.

2. The coolant and oil in the systems are hot when the engine is stopped, so be careful not to get burned. Wait for the oil and coolant to cool before carrying out any work on the oil or coolant systems.

3. Before starting work, remove the leads from the battery. ALWAYS remove the lead from the negative (-) terminal first.

4. When raising heavy components, use a hoist or crane. Check that the wire rope, chains and hooks are free from damage. Always use lifting equipment which has ample capacity. Install the lifting equipment at the correct places. Use a hoist or crane and operate slowly to prevent the component from hitting anything. Do not work with any part while it is still raised by the hoist or crane.

5. When removing covers which are under internal pressure or under pressure from a spring, always leave two bolts in position on opposite sides. Slowly release the pressure, then slowly loosen the bolts to remove.

6. When removing components, be careful not to break or damage the wiring. Damaged wiring may cause electrical fires.

7. When removing piping, stop the fuel or oil from spilling out. If any fuel or oil drips on to the floor, wipe it up immediately. Fuel or oil on the floor can cause you to slip, or even start fires.

8. Never use flammable liquids to clean parts. Always use approved non-flammable solvents to clean parts.

9. Be sure to assemble all parts in their original locations. Replace any damaged part with new parts.
   - When installing hoses and wires, be sure that they will not be damaged by contact with other parts when the machine is being operated.

10. When installing high pressure hoses, be sure that they are not twisted. Damaged tubing is dangerous. Be extremely careful when installing tubes for high pressure circuits. Also make sure parts are correctly installed.

11. When assembling or installing parts, always use the specified tightening torques and sequences. When installing protective parts such as guards, or parts that may vibrate or rotate at high speeds, be particularly careful to check their installation carefully.

12. When aligning two holes, never insert your fingers or hand. Use appropriate tools to align parts.

13. When measuring hydraulic pressure, be sure the measuring tool is correctly assembled before taking any measurements.

14. Take care when removing or installing the tracks on track-type machines. When removing the track, the track separates suddenly. Never let anyone stand at either end of the track.

15. When making repairs or adjustments on electronically-controlled engines, avoid any physical contact with the injection system's wiring harness while the engine is running. Due to the high voltage and amperage in this system, serious injury may occur.

16. Never use a welder or machine with a higher voltage to jump-start or supply voltage to a machine with a lower voltage system. Damage to the machine's electrical system, a fire or an explosion may result. Always stay within the same voltage range as the machine.

GENERAL

This shop manual has been prepared as an aid to improve the quality of repairs by giving the serviceman an accurate understanding of the product and by showing him the correct way to perform repairs and make judgements. Make sure you understand the contents of this manual and use it to full effect at every opportunity.

This shop manual mainly contains the necessary technical information for operations performed in a service workshop. For ease of understanding, the manual is divided into the following sections. These sections are further divided into each main group of components.

GENERAL

This section lists the general machine dimensions, performance specifications, component weights, and fuel, coolant and lubricant specification charts.

STRUCTURE, FUNCTION AND MAINTENANCE STANDARD

This section explains the structure and function of each component. It serves not only to give an understanding of the structure, but also serves as reference material for troubleshooting. In addition, this section gives the judgement standards when inspecting disassembled parts.

STANDARD VALUE TABLES

This section explains the standard values for new machine and judgement criteria for testing, adjusting and troubleshooting. This standard value table is used to check the standard values in testing and adjusting and to judge parts in troubleshooting.

TESTING AND ADJUSTING

This section explains checks to be made before and after performing repairs, as well as adjustments to be made at completion of the checks and repairs.

TROUBLESHOOTING

Troubleshooting charts correlating “Problems” to “Causes” are also included in this section.

DISASSEMBLY AND ASSEMBLY

This section explains the order to be followed when removing, installing, disassembling or assembling each component, as well as precautions to be taken for these operations.

OTHER

This section has the foldout drawings for the machine.

NOTICE

The specifications contained in this shop manual are subject to change at any time and without any advance notice. Contact your distributor for the latest information.

HOW TO READ THE SHOP MANUAL

VOLUMES

Shop manuals are issued as a guide to carrying out repairs. They are divided as follows:

Chassis volume: Issued for every machine model
Engine volume: Issued for each engine series

Electrical volume: Each issued as one to cover all models
Attachment volume: Each issued as one to cover all models

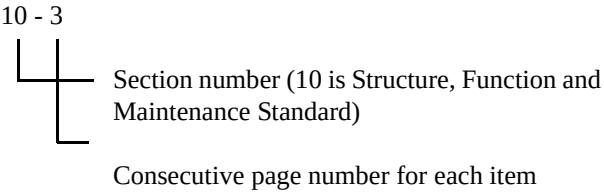
These various volumes are designed to avoid duplication of information. Therefore to deal with all repairs for any model, it is necessary that chassis, engine, electrical and attachment be available.

DISTRIBUTION AND UPDATING

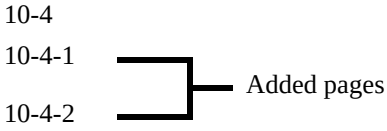
Any additions, amendments or other changes will be sent to your distributors. Get the most up-to-date information before you start any work.

FILING METHOD

1. See the page number on the bottom of the page. File the pages in correct order.
2. Following examples show how to read the page number:
   Example:



3. Additional pages: Additional pages are indicated by a hyphen (-) and numbered after the page number. File as in the example.
   Example:



REVISED EDITION MARK

When a manual is revised, an edition mark (①, ②, ③, etc.) is recorded on the bottom outside corner of the pages.

REVISIONS

Revised pages are shown on the LIST OF REVISED PAGES between the TITLE PAGE and SAFETY page.

SYMBOLS

So that the shop manual can be of ample practical use, important places for safety and quality are marked with the following symbols.

Symbol	Item	Remarks
	Safety	Special safety precautions are necessary when performing the work.
★	Caution	Special technical precautions or other precautions for preserving standards are necessary when performing the work.
	Weight	Weight of parts or systems. Caution necessary when selecting hoisting wire or when working posture is important, etc.
	Tightening torque	Places that require special attention for tightening torque during assembly.
	Coat	Places to be coated with adhesives and lubricants etc.
	Oil, water	Places where oil, water or fuel must be added, and the capacity.
	Drain	Places where oil or water must be drained, and quantity to be drained.

HOISTING INSTRUCTIONS

HOISTING

WARNING! Heavy parts (25 kg (55 lb) or more) must be lifted with a hoist, crane, etc. Every part weighing 25 kg (55 lb) or more is indicated clearly with this symbol.

- If a part cannot be smoothly removed from the machine by hoisting, the following checks should be made:

1. Check for removal of all bolts fastening the part to the relative parts.
2. Check for existence of another part causing interference with the part to be removed.

WIRE ROPES

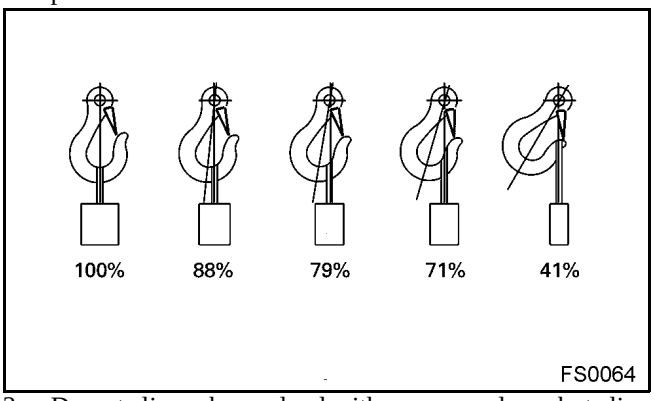
1. Use adequate ropes depending on the weight of parts to be hoisted, referring to the table below:

Wire ropes
(Standard “Z” or “S” twist ropes without galvanizing)

Rope diameter	Allowable load	
mm (in)	kN	tons
10 (0.39)	9.8	1.0
11.2 (0.44)	13.7	1.4
12.5 (0.49)	15.7	1.6
14 (0.55)	21.6	2.2
16 (0.63)	27.5	2.8
18 (0.71)	35.3	3.6
20 (0.79)	43.1	4.4
22.4 (0.88)	54.9	5.6
30 (1.18)	98.1	10.0
40 (1.57)	176.5	18.0
50 (1.97)	274.6	28.0
60 (2.36)	392.2	40.0

★ The allowable load value is estimated to be 1/6 or 1/7 of the breaking strength of the rope used.

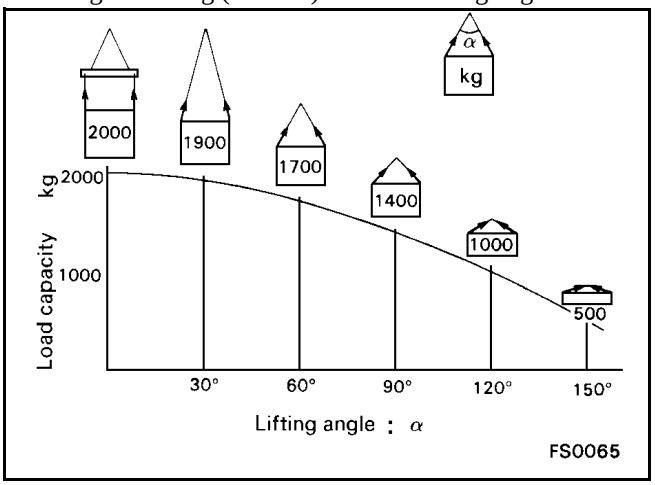
2. Sling wire ropes from the middle portion of the hook. Slinging near the edge of the hook may cause the rope to slip off the hook during hoisting, and a serious accident can result. Hooks have maximum strength at the middle portion.



3. Do not sling a heavy load with one rope alone, but sling with two or more ropes symmetrically wound on to the load.

WARNING! Slinging with one rope may cause turning of the load during hoisting, untwisting of the rope, or slipping of the rope from its original winding position on the load, which can result in a dangerous accident.

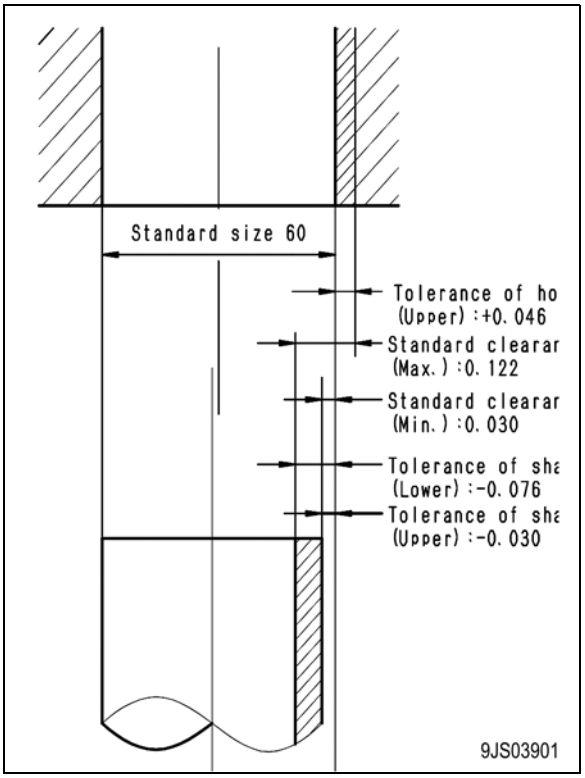
4. Do not sling a heavy load with ropes forming a wide hanging angle from the hook. When hoisting a load with two or more ropes, the force subjected to each rope will increase with the hanging angles. The table below shows the variation of allowable load when hoisting with two ropes, each of which is allowed to sling up to 1000 kg (2205 lb) vertically, at various hanging angles. When two ropes sling a load vertically, up to 2000 kg (4409 lb) of total weight can be suspended. This weight becomes 1000 kg when two ropes make a 120° hanging angle. On the other hand, two ropes are subject to an excessive force as large as 4000 kg (8818 lb) if they sling a 2000 kg (4409 lb) load at a lifting angle of 150°.



EXPLANATION OF TERMS FOR MAINTENANCE STANDARD

The maintenance standard values necessary for judgment of products and parts are described by the following terms.

1. Standard size and tolerance
   - To be accurate, the finishing size of parts is a little different from one to another.
   - To specify a finishing size of a part, a temporary standard size is set and an allowable difference from that size is indicated.
   - The above size set temporarily is called the "standard size" and the range of difference from the standard size is called the "tolerance."
   - The tolerance with the symbols of + or – is indicated on the right side of the standard size.



Example:

Standard size	Tolerance
120	-0.022 -0.126

★ The tolerance may be indicated in the text and a table as [standard size (upper limit of tolerance/lower limit of tolerance)].
Example: 120 (–0.022/–0.126)

● Usually, the size of a hole and the size of the shaft to be fitted to that hole are indicated by the same standard size and different tolerances of the hole and shaft. The tightness of fit is decided by the tolerance.

● Indication of size of rotating shaft and hole and relationship drawing of them

Standard size	Tolerance	
	Shaft	Hole
60	-0.030 -0.076	+0.046 0

2. Standard clearance and standard value
   - The clearance made when new parts are assembled is called the "standard clearance," which is indicated by the range from the minimum clearance to the maximum clearance.
   - When some parts are repaired, the clearance is generally adjusted to the standard clearance.
   - A value of performance and function of new products or equivalent is called the "standard value," which is indicated by a range or a target value.
   - When some parts are repaired, the value of performance/function is set to the standard value.

3. Standard interference
   - When the size of a hole is smaller than the size of a shaft because of the standard size and tolerance, the difference between these sizes is called the "interference."
   - The range (A – B) from the difference (A) between the minimum size of the shaft and the maximum size of the hole to the difference (B) between the maximum size of the shaft and the minimum size of the hole is the "standard interference."

- After repairing or replacing some parts, measure the size of their hole and shaft and check that the interference is in the standard range.

4. Repair limit and allowable value
   - The size of a part changes because of wear and deformation while it is used. The limit of changed size is called the "repair limit."
   - If a part is worn to the repair limit must be replaced or repaired.
   - The performance and function of a product lowers while it is used. A value below which the product can be used without causing a problem is called the "allowable value."
   - If a product is worn to the allowable value, it must be checked or repaired. The permissible value is estimated from various tests or experiences in most cases, however, it must be judged after considering the operating condition and customer's requirement.

5. Clearance limit
   - Parts can be used until the clearance between them is increased to a certain limit. The limit at which those parts cannot be used is called the "clearance limit."
   - If the clearance between the parts exceeds the clearance limit, they must be replaced or repaired.

6. Interference limit
   - The allowable maximum interference between the hole of a part and the shaft of another part to be assembled is called the "interference limit."
   - The interference limit shows the repair limit of the part of smaller tolerance.
   - If the interference between the parts exceeds the interference limit, they must be replaced or repaired.

COATING MATERIALS

★ The recommended coating materials prescribed in the shop manuals are listed below.

Category	Code	Part No.	Quantity	Container	Main applications, features
Adhesives	LT-1A	790-129-9030	150 g	Tube	● Used to prevent rubber gaskets, rubber cushions and cork plugs from coming out.
	LT-1B	790-129-9050	20 g (2 pcs.)	Polyethylene container	● Used in places requiring an immediately effective, strong adhesive. ● Used for plastics (except polyethylene, polypropylene, tetrafluoroethylene, and vinyl chloride), rubber, metal and non-metal.
	LT-2	09940-00030	50 g	Polyethylene container	● Features: Resistance to heat, chemicals ● Used for anti-loosening and sealant purposes for bolts and plugs.
	LT-3	790-129-9060 (Set of adhesive and hardening agent)	Adhesive: 1 kg Hardening agent: 500 g	Can	● Used as adhesive or sealant for metal, glass or plastic.
	LT-4	790-129-9040	250 g	Polyethylene container	● Used as sealant for machined holes.
	Holtz MH 705	790-126-9120	75 g	Tube	● Used as heat-resisting sealant for repairing engine.
	Three bond 1735	179-129-9140	2 g	Polyethylene container	● Quick hardening type adhesive ● Cure time: within five seconds to three minutes ● Used mainly for adhesion of metals, rubbers, plastics and woods.
	Aron-alpha 201	790-129-9130	50 g	Polyethylene container	● Quick hardening type adhesive ● Quick cure type (maximum strength after 30 minutes) ● Used mainly for adhesion of rubbers, plastics and metals.
	Loctite 648-50	79A-129-9110	50 cc	Polyethylene container	● Features: Resistance to heat, chemicals ● Used at joint portions subject to high temperature.
Gasket sealant	LG-1	790-129-9010	200 g	Tube	● Used as adhesive or sealant for gaskets and packing of power train case, etc.
	LG-3	790-129-9070	1 kg	Can	● Features: Resistance to heat ● Used as sealant for flange surfaces and bolts at high temperature locations; used to prevent seizure. ● Used as sealant for heat resistant gasket for high temperature locations such as engine pre-combustion chamber, exhaust pipe.

Category	Code	Part No.	Quantity	Container	Main applications, features
Gasket sealant	LG-4	790-129-9020	200 g	Tube	● Features: Resistance to water, oil ● Used as sealant for flange surface, thread. ● Also possible to use as sealant for flanges with large clearance. ● Used as sealant for mating surfaces of final drive case, transmission case.
	LG-5	790-129-9080	1 kg	Polyethylene container	● Used as sealant for various threads, pipe joints, flanges. ● Used as sealant for tapered plugs, elbows, nipples of hydraulic piping.
	LG-6	09940-00011	250 g	Tube	● Features: Silicon based, resistant to heat, cold ● Used as sealant for flange surface, thread. ● Used as sealant for oil pan, final drive case, etc.
	LG-7	09920-00150	150 g	Tube	● Features: Silicon based, quick hardening type ● Used as sealant for flywheel housing, intake manifold, oil pan, thermostat housing, etc.
	Three bond 1211	790-129-9090	100 g	Tube	● Used as heat-resisting sealant for repairing engines.
Molybdenum disulphide lubricant	LM-G	09940-00051	60 g	Can	● Used as lubricant for sliding parts (to prevent squeaking).
	LM-P	09940-00040	200 g	Tube	● Used to prevent seizure or scuffing of the thread when press fitting or shrink fitting. ● Used as lubricant for linkage, bearings, etc.
Grease	G2-LI	SYG2-400LI SYG2-350LI SYG2-400LI-A SYG2-160LI SYGA160CNLI	Various	Various	● General purpose type
	G2-CA	SYG2-400CA SYG2-350CA SYG2-400CA-A SYG2-160CA SYG2-160CNCA	Various	Various	● Used for normal temperature, light load bearing at places in contact with water or steam.
	Molybdenum disulphide lubricant	SYG2-400M	400 g (10 per case)	Belows type	● Used for places with heavy load.

STANDARD TIGHTENING TORQUE

STANDARD TIGHTENING TORQUE OF BOLTS AND NUTS

The following charts give the standard tightening torques of bolts and nuts. Exceptions are given in DISASSEMBLY AND ASSEMBLY.

Thread diameter of bolt	Width across flats		
mm	mm	N·m	lbf ft
6	10	13.2 ±1.4	9.7 ±1.0
8	13	31.4 ±2.9	23.2 ±2.1
10	17	65.7 ±6.8	48.5 ±5.0
12	19	112 ±9.8	82.6 ±7.2
14	22	177 ±19	130.5 ±14.0
16	24	279 ±29	205.8 ±23.4
18	27	383 ±39	282.5 ±28.8
20	30	549 ±58	404.9 ±42.8
22	32	745 ±78	549.5 ±57.5
24	36	927 ±98	683.7 ±72.3
27	41	1320 ±140	973.6 ±103.2
30	46	1720 ±190	1268.6 ±140.1
33	50	2210 ±240	1630.0 ±177.0
36	55	2750 ±290	2028.3 ±213.9
39	60	3280 ±340	2419.2 ±250.8

Thread diameter of bolt	Width across flats	
mm	mm	N·m	lbf ft
6	10	7.85 ±1.95	5.75 ±1.4
8	13	18.6 ±4.9	13.7 ±3.6
10	14	40.2 ±5.9	29.6 ±4.4
12	27	82.35 ±7.85	60.7 ±5.8

TIGHTENING TORQUE OF HOSE NUTS

Use these torques for hose nuts.

Nominal No.	Thread diameter	Width across flats	Tightening torque	
	mm	mm	N·m	lbf ft
02	14	19	24.5 ±4.9	18.1 ±3.6
03	18	24	49 ±19.6	36.1 ±14.4
04	22	27	78.5 ±19.6	57.9 ±14.4
05	24	32	137.3 ±29.4	101.3 ±21.7
06	30	36	176.5 ±29.4	130.2 ±21.7
10	33	41	196.1 ±49	144.6 ±36.1
12	36	46	245.2 ±49	180.9 ±36.1
14	42	55	294.2 ±49	217.0 ±36.1

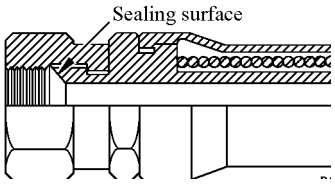
TIGHTENING TORQUE OF SPLIT FLANGE BOLTS

Use these torques for split flange bolts.

Thread diameter	Width across flats	Tightening torque	
mm	mm	N·m	lbf ft
10	14	65.7 ±6.8	48.5 ±5.0
12	17	112 ±9.8	82.6 ±7.2
16	22	279 ±29	205.8 ±21.4

TIGHTENING TORQUE FOR FLARED NUTS

Use these torques for flared part of nut.



Thread diameter	Width across flats	Tightening torque	
mm	mm	N·m	lbf ft
14	19	24.5 ±4.9	18.0 ±3.6
18	24	49 ±19.6	36.1 ±14.5
22	27	78.5 ±19.6	57.9 ±14.5
24	32	137.3 ±29.4	101.3 ±21.7
30	36	176.5 ±29.4	130.2 ±21.7
33	41	196.1 ±49	144.6 ±36.1
36	46	245.2 ±49	180.9 ±36.1
42	55	294.2 ±49	217.0 ±36.1

TABLE OF TIGHTENING TORQUES FOR O-RING BOSS PIPING JOINTS

★ Unless there are special instructions, tighten the O-ring boss piping joints to the torque below.

Nominal No.	Thread diameter	Width across flat	Tightening torque (Nm {lbf ft})	
	mm	mm	Range	Target
02	14	Varies depending on type of connector.	35 - 63 {25.81 - 46.46}	44 {32.45}
03, 04	20		84 - 132 {61.95 - 97.35}	103 {75.96}
05, 06	24		128 - 186 {94.40 - 137.18}	157 {115.79}
10, 12	33		363 - 480 {267.73 - 354.02}	422 {311.25}
14	42		746 - 1010 {550.22 - 744.93}	883 {651.26}

TABLE OF TIGHTENING TORQUES FOR O-RING BOSS PLUGS

★ Unless there are special instructions, tighten the O-ring boss plugs to the torque below.

Nominal No.	Thread diameter	Width across flat	Tightening torque (Nm {lbf lb})	
	mm	mm	Range	Target
08	08	14	5.88 - 8.82 {4.33 - 6.50}	7.35 {5.42}
10	10	17	9.8 - 12.74 {7.22 - 9.39}	11.27 {8.31}
12	12	19	14.7 - 19.6 {10.84 - 14.45}	17.64 {13.01}
14	14	22	19.6 - 24.5 {14.45 - 18.07}	22.54 {16.62}
16	16	24	24.5 - 34.3 {18.07 - 25.29}	29.4 {21.68}
18	18	27	34.3 - 44.1 {25.29 - 32.52}	39.2 {28.91}
20	20	30	44.1 - 53.9 {32.52 - 39.75}	49.0 {36.14}
24	24	32	58.8 - 78.4 {43.36 - 57.82}	68.6 {50.59}
30	30	32	93.1 - 122.5 {68.66 - 90.35}	107.8 {79.50}
33	33	-	107.8 - 147.0 {79.50 - 108.42}	124.4 {91.75}
36	36	36	127.4 - 176.4 {93.96 - 130.10}	151.9 {112.03}
42	42	-	181.3 - 240.1 {133.72 - 177.08}	210.7 {155.40}
52	52	-	274.4 - 367.5 {202.38 - 271.05}	323.4 {238.52}

TIGHTENING TORQUE TABLE FOR HOSES (TAPER SEAL TYPE AND FACE SEAL TYPE)

★ Tighten the hoses (taper seal type and face seal type) to the following torque, unless otherwise specified.

★ Apply the following torque when the threads are coated (wet) with engine oil.

Nominal size of hose	Width across flats	Tightening torque (Nm {lbf ft})		Taper seal type	Face seal type	
		Range	Target	Thread size (mm)	Nominal thread size - Threads per inch, Thread series	Root diameter (mm) (Reference)
02	19	34 - 54 {25.0 - 39.8}	44 {32.4}	-	9/16 - 18UN	14.3
		34 - 63 {25.0 - 46.4}	44 {32.4}	14	-	-
03	22	54 - 93 {39.8 - 68.5}	74 {54.5}	-	11/16 -16UN	17.5
	24	59 - 98 {43.5 - 72.2}	78 57.5}	18	-	-
04	27	84 - 132 {61.9 - 97.3}	103 {75.9}	22	13/16 - 16UN	20.6
05	32	128 - 186 {94.4 - 137.1}	157 {115.7}	24	1 - 14UNS	25.4
06	36	177 - 245 {130.5 - 180.7}	216 {159.3}	30	1 3/16 - 12UN	30.2
(10)	41	177 - 245 {130.5 - 180.7}	216 {159.3}	33	-	-
(12)	46	197 - 294 {145.3 - 216.8}	245 {180.7}	36	-	-
(14)	55	246 - 343 {181.4 - 252.9}	294 {216.8}	42	-	-

ELECTRIC WIRE CODE

In the wiring diagrams, various colors and symbols are employed to indicate the thickness of wires. This wire code table will help you understand WIRING DIAGRAMS.
Example: 05WB indicates a cable having a nominal number 05 and white coating with black stripe.

CLASSIFICATION BY THICKNESS

Nominal number	Copper wire			Cable O.D. (mm)	Current rating (A)	Applicable circuit
	Number of strands	Dia. Of strand (mm)	Cross section (mm)			
0.85	11	0.32	0.88	2.4	12	Starting, lighting, signal etc.
2	26	0.32	2.09	3.1	20	Lighting, signal etc.
5	65	0.32	5.23	4.6	37	Charging and signal
15	84	0.45	13.36	7.0	59	Starting (Glow plug)
40	85	0.80	42.73	11.4	135	Starting
60	127	0.80	63.84	13.6	178	Starting
100	217	0.80	109.1	17.6	230	Starting

CLASSIFICATION BY COLOR AND CODE

Priority	Circuits Classification		Charging	Ground	Starting	Lighting	Instrument	Signal	Other
1	Primary	Code	W	B	B	R	Y	G	L
		Color	White	Black	Black	Red	Yellow	Green	Blue
2	Auxiliary	Code	WR	—	BW	RW	YR	GW	LW
		Color	White & Red	—	Black & White	Red & White	Yellow & Red	Green & White	Blue & White
3		Code	WB	—	BY	RB	YB	GR	LR
		Color	White & Black	—	Black & Yellow	Red & Black	Yellow & Black	Green & Red	Blue & Red
4		Code	WL	—	BR	RY	YG	GY	LY
		Color	White & Blue	—	Black & Red	Red & Yellow	Yellow & Green	Green & Yellow	Blue & Yellow
5		Code	WG	—	—	RG	YL	GB	LB
		Color	White & Green	—	—	Red & Green	Yellow & Blue	Green & Black	Blue & Black
6		Code	—	—	—	RL	YW	GL	—
		Color	—	—	—	Red & Blue	Yellow & White	Green & Blue	—

CONNECTING PUSH-PULL TYPE COUPLER

WARNING! Before carrying out the following work, loosen the oil filler cap of the hydraulic tank gradually to release the residual pressure from the hydraulic tank.

WARNING! Even if the residual pressure is released from the hydraulic tank, some hydraulic oil flows out when the hose is disconnected. Accordingly, prepare a container to catch oil.

★ **Type 1**

1. Disconnection
   A. Hold adapter (1) and push hose joint (2) into mating adapter (3) (Fig. 1).
      - The adapter can be pushed in about 3.5 mm (0.14 in).
      - Do not hold rubber cap portion (4).
   B. After hose joint (2) is pushed into adapter (3), press rubber cap portion (4) against adapter (3) until it clicks (Fig. 2).
   C. Hold hose adapter (1) or hose (5) and pull it out (Fig. 3).
      - Since some hydraulic oil flows out, prepare a container to catch oil.

Fig. 1

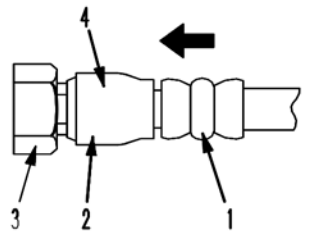


Fig. 2

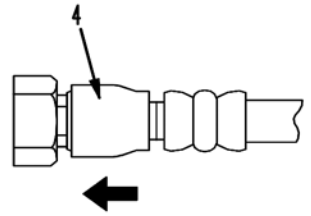
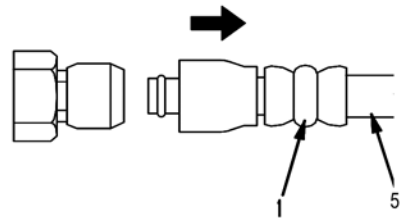


Fig. 3



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2. Connection
   A. Hold hose adapter (1) or hose (5) and insert it in mating adapter (3), aligning them with each other (Fig. 4).
      - Do not hold rubber cap portion (4).
   B. After inserting the hose in the mating adapter perfectly, pull it back to check its connecting condition (Fig. 5).
      - When the hose is pulled back, the rubber cap portion moves toward the hose about 3.5 mm (0.14 in). This does not indicate an abnormality, however.

Fig. 4

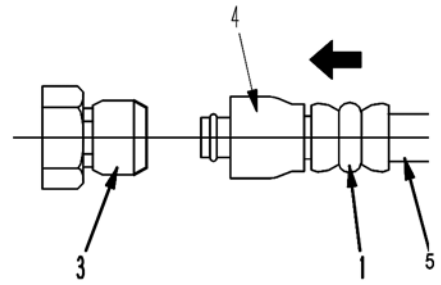
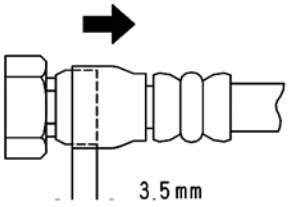


Fig. 5



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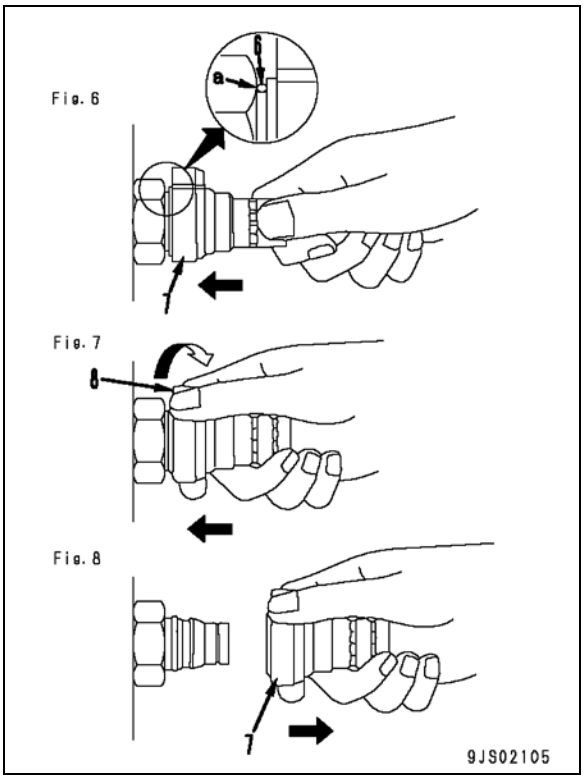
★ **Type 2**

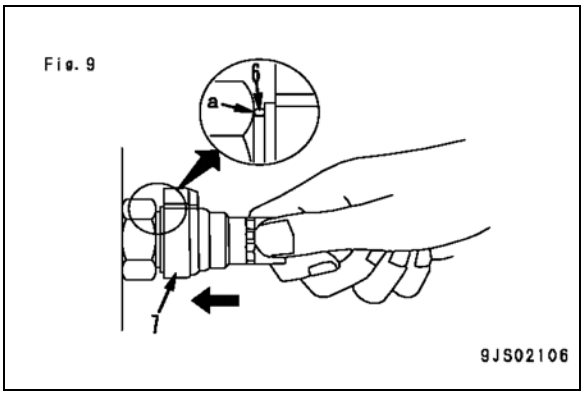
1. Disconnection
   A. Hold the tightening portion and push body (7) straight until sliding prevention ring (6) contacts contact surface (a) of the hexagonal portion at the male end (Fig. 6).

   B. While holding the condition of Step A, turn lever (8) to the right (clockwise) (Fig. 7).

   C. While holding the condition of Steps A and B, pull out whole body (7) to disconnect it (Fig. 8).



2. Connection
   • Hold the tightening portion and push body (7) straight until sliding prevention ring (6) contacts contact surface (a) of the hexagonal portion at the male end (Fig. 9).

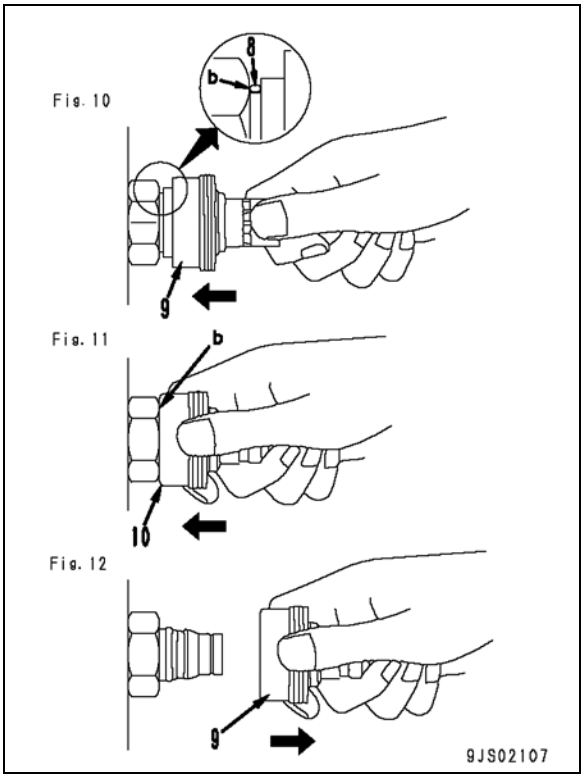


★ **Type 3**

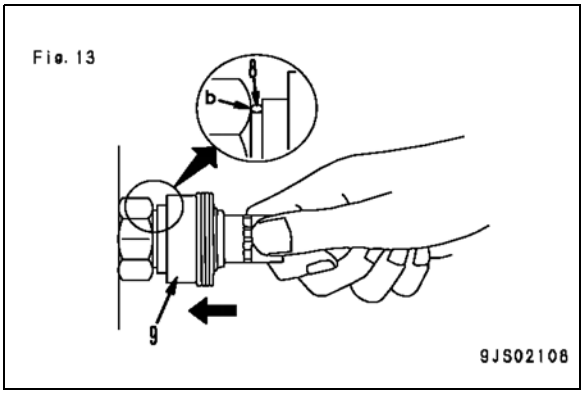
1. Disconnection
   A. Hold the tightening portion and push body (9) straight until sliding prevention ring (8) touches contact surface (b) of the hexagonal portion at the male end (Fig. 10).

   B. While holding the condition of Step A, push cover (10) straight until it contacts surface (b) of the hexagonal portion at the male end (Fig. 11).

   C. While holding the condition of Steps A and B, pull out whole body (9) to disconnect it (Fig. 12).



2. Connection
   • Hold the tightening portion and push body (9) straight until the sliding prevention ring contacts surface (b) of the hexagonal portion at the male end (Fig. 13).



CONVERSION TABLES

METHOD OF USING THE CONVERSION TABLE

The Conversion Table in this section is provided to enable simple conversion of figures. For details of the method of using the Conversion Table, see the example given below.

EXAMPLE

- Method of using the Conversion Table to convert from millimeters to inches

1. Convert 55 mm into inches
   A. Locate the number 50 in the vertical column at the left side, take this as ①, then draw a horizontal line from ①.

   B. Locate the number 5 in the row across the top, take this as ②, then draw a perpendicular line down from ②.

   C. Take the point where the two lines cross as ③. This point ③ gives the value when converting from millimeters to inches. Therefore, 55 millimeters = 2.165 inches.

2. Convert 550 mm into inches
   A. The number 550 does not appear in the table, so divide by 10 (move the decimal one place to the left) to convert it to 55 mm.

   B. Carry out the same procedure as above to convert 55 mm to 2.165 inches.

   C. The original value (550 mm) was divided by 10, so multiply 2.165 inches by 10 (move the decimal one place to the right) to return to the original value. This gives 550 mm = 21.65 inches.

Millimeters to Inches **1 mm = 0.03937 in**

	0	1	2	3	4	5 ②	6	7	8	9
0	0	0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354
10	0.394	0.433	0.472	0.512	0.551	0.591	0.630	0.669	0.709	0.748
20	0.787	0.827	0.866	0.906	0.945	0.984	1.024	1.063	1.102	1.142
30	1.181	1.220	1.260	1.299	1.339	1.378	1.417	1.457	1.496	1.536
40	1.575	1.614	1.654	1.693	1.732	1.772	1.811	1.850	1.890	1.929
50 ①	1.969	2.008	2.047	2.087	2.126	2.165 ③	2.205	2.244	2.283	2.323
60	2.362	2.402	2.441	2.480	2.520	2.559	2.598	2.638	2.677	2.717
70	2.756	2.795	2.835	2.874	2.913	2.953	2.992	3.032	3.071	3.110
80	3.150	3.189	3.228	3.268	3.307	3.346	3.386	3.425	3.465	3.504
90	3.543	3.583	3.622	3.661	3.701	3.740	3.780	3.819	3.858	3.898

Millimeters to Inches **1 mm = 0.03937 in**

	0	1	2	3	4	5	6	7	8	9
0	0	0.039	0.079	0.118	0.157	0.197	0.236	0.276	0.315	0.354
10	0.394	0.433	0.472	0.512	0.551	0.591	0.630	0.669	0.709	0.748
20	0.787	0.827	0.866	0.906	0.945	0.984	1.024	1.063	1.102	1.142
30	1.181	1.220	1.260	1.299	1.339	1.378	1.417	1.457	1.496	1.536
40	1.575	1.614	1.654	1.693	1.732	1.772	1.811	1.850	1.890	1.929
50	1.969	2.008	2.047	2.087	2.126	2.165	2.205	2.244	2.283	2.323
60	2.362	2.402	2.441	2.480	2.520	2.559	2.598	2.638	2.677	2.717
70	2.756	2.795	2.835	2.874	2.913	2.953	2.992	3.032	3.071	3.110
80	3.150	3.189	3.228	3.268	3.307	3.346	3.386	3.425	3.465	3.504
90	3.543	3.583	3.622	3.661	3.701	3.740	3.780	3.819	3.858	3.898

Kilogram to Pound **1 kg = 2.2046 lb**

	0	1	2	3	4	5	6	7	8	9
0	0	2.20	4.41	6.61	8.82	11.02	13.23	15.43	17.64	19.84
10	22.05	24.25	26.46	28.66	30.86	33.07	35.27	37.48	39.68	41.89
20	44.09	46.30	48.50	50.71	51.91	55.12	57.32	59.53	61.73	63.93
30	66.14	68.34	70.55	72.75	74.96	77.16	79.37	81.57	83.78	85.98
40	88.18	90.39	92.59	94.80	97.00	99.21	101.41	103.62	105.82	108.03
50	110.23	112.44	114.64	116.85	119.05	121.25	123.46	125.66	127.87	130.07
60	132.28	134.48	136.69	138.89	141.10	143.30	145.51	147.71	149.91	152.12
70	154.32	156.53	158.73	160.94	163.14	165.35	167.55	169.76	171.96	174.17
80	176.37	178.57	180.78	182.98	185.19	187.39	189.60	191.80	194.01	196.21
90	198.42	200.62	202.83	205.03	207.24	209.44	211.64	213.85	216.05	218.26

Liter to U.S. Gallon **1 ℓ = 0.2642 U.S. Gal**

	0	1	2	3	4	5	6	7	8	9
0	0	0.264	0.528	0.793	1.057	1.321	1.585	1.849	2.113	2.378
10	2.642	2.906	3.170	3.434	3.698	3.963	4.227	4.491	4.755	5.019
20	5.283	5.548	5.812	6.076	6.340	6.604	6.869	7.133	7.397	7.661
30	7.925	8.189	8.454	8.718	8.982	9.246	9.510	9.774	10.039	10.303
40	10.567	10.831	11.095	11.359	11.624	11.888	12.152	12.416	12.680	12.944
50	13.209	13.473	13.737	14.001	14.265	14.529	14.795	15.058	15.322	15.586
60	15.850	16.115	16.379	16.643	16.907	17.171	17.435	17.700	17.964	18.228
70	18.492	18.756	19.020	19.285	19.549	19.813	20.077	20.341	20.605	20.870
80	21.134	21.398	21.662	21.926	22.190	22.455	22.719	22.983	23.247	23.511
90	23.775	24.040	24.304	24.568	24.832	25.096	25.361	25.625	25.889	26.153

Liter to U.K. Gallon **1 ℓ = 0.21997 U.K. Gal**

	0	1	2	3	4	5	6	7	8	9
0	0	0.220	0.440	0.660	0.880	1.100	1.320	1.540	1.760	1.980
10	2.200	2.420	2.640	2.860	3.080	3.300	3.520	3.740	3.950	4.179
20	4.399	4.619	4.839	5.059	5.279	5.499	5.719	5.939	6.159	6.379
30	6.599	6.819	7.039	7.259	7.479	7.699	7.919	8.139	8.359	8.579
40	8.799	9.019	9.239	9.459	9.679	9.899	10.119	10.339	10.559	10.778
50	10.998	11.281	11.438	11.658	11.878	12.098	12.318	12.528	12.758	12.978
60	13.198	13.418	13.638	13.858	14.078	14.298	14.518	14.738	14.958	15.178
70	15.398	15.618	15.838	16.058	16.278	16.498	16.718	16.938	17.158	17.378
80	17.598	17.818	18.037	18.257	18.477	18.697	18.917	19.137	19.357	19.577
90	19.797	20.017	20.237	20.457	20.677	20.897	21.117	21.337	21.557	21.777

kgm to ft lb **1 kgm = 7.233 ft lb**

	0	1	2	3	4	5	6	7	8	9
0	0	7.2	14.5	21.7	28.9	36.2	43.4	50.6	57.9	65.1
10	72.3	79.6	86.8	94.0	101.3	108.5	115.7	123.0	130.2	137.4
20	144.7	151.9	159.1	166.4	173.6	180.8	188.1	195.3	202.5	209.8
30	217.0	224.2	231.5	238.7	245.9	253.2	260.4	267.6	274.9	282.1
40	289.3	296.6	303.8	311.0	318.3	325.5	332.7	340.0	347.2	354.4
50	361.7	368.9	376.1	383.4	390.6	397.8	405.1	412.3	419.5	426.8
60	434.0	441.2	448.5	455.7	462.9	470.2	477.4	484.6	491.8	499.1
70	506.3	513.5	520.8	528.0	535.2	542.5	549.7	556.9	564.2	571.4
80	578.6	585.9	593.1	600.3	607.6	614.8	622.0	629.3	636.5	643.7
90	651.0	658.2	665.4	672.7	679.9	687.1	694.4	701.6	708.8	716.1
100	723.3	730.5	737.8	745.0	752.2	759.5	766.7	773.9	781.2	788.4
110	795.6	802.9	810.1	817.3	824.6	831.8	839.0	846.3	853.5	860.7
120	868.0	875.2	882.4	889.7	896.9	904.1	911.4	918.6	925.8	933.1
130	940.3	947.5	954.8	962.0	969.2	976.5	983.7	990.9	998.2	1005.4
140	1012.6	1019.9	1027.1	1034.3	1041.5	1048.8	1056.0	1063.2	1070.5	1077.7
150	1084.9	1092.2	1099.4	1106.6	1113.9	1121.1	1128.3	1135.6	1142.8	1150.0
160	1157.3	1164.5	1171.7	1179.0	1186.2	1193.4	1200.7	1207.9	1215.1	1222.4
170	1129.6	1236.8	1244.1	1251.3	1258.5	1265.8	1273.0	1280.1	1287.5	1294.7
180	1301.9	1309.2	1316.4	1323.6	1330.9	1338.1	1345.3	1352.63	1359.8	1367.0
190	1374.3	1381.5	1388.7	1396.0	1403.2	1410.4	1417.7	1424.9	1432.1	1439.4

kg/cm^2 to lb/in^2 **1 kg/cm^2 = 14.2233lb/in^2**

	0	1	2	3	4	5	6	7	8	9
0	0	14.2	28.4	42.7	56.9	71.1	85.3	99.6	113.8	128.0
10	142.2	156.5	170.7	184.9	199.1	213.4	227.6	241.8	256.0	270.2
20	284.5	298.7	312.9	327.1	341.4	355.6	369.8	384.0	398.3	412.5
30	426.7	440.9	455.1	469.4	483.6	497.8	512.0	526.3	540.5	554.7
40	568.9	583.2	597.4	611.6	625.8	640.1	654.3	668.5	682.7	696.9
50	711.2	725.4	739.6	753.8	768.1	782.3	796.5	810.7	825.0	839.2
60	853.4	867.6	881.8	896.1	910.3	924.5	938.7	953.0	967.2	981.4
70	995.6	1010	1024	1038	1053	1067	1081	1095	1109	1124
80	1138	1152	1166	1181	1195	1209	1223	1237	1252	1266
90	1280	1294	1309	1323	1337	1351	1365	1380	1394	1408
100	1422	1437	1451	1465	1479	1493	1508	1522	1536	1550
110	1565	1579	1593	1607	1621	1636	1650	1664	1678	1693
120	1707	1721	1735	1749	1764	1778	1792	1806	1821	1835
130	1849	1863	1877	1892	1906	1920	19324	1949	1963	1977
140	1991	2005	2034	2048	2062	2077	2091	2105	2119	
150	2134	2148	2162	2176	2190	2205	2219	2233	2247	2262
160	2276	2290	2304	2318	2333	2347	2361	2375	2389	2404
170	2418	2432	2446	2460	2475	2489	2503	2518	2532	2546
180	2560	2574	2589	2603	2617	2631	2646	2660	2674	2688
190	2702	2717	2731	2745	2759	2773	2788	2802	2816	2830
200	2845	2859	2873	2887	2901	2916	2930	2944	2958	2973
210	2987	3001	3015	3030	3044	3058	3072	3086	3101	3115
220	3129	3143	3158	3172	3186	3200	3214	3229	3243	3257
230	3271	3286	3300	3314	3328	3343	3357	3371	3385	3399
240	3414	3428	3442	3456	3470	3485	3499	3513	3527	3542

Temperature

Fahrenheit Centigrade Conversion; a simple way to convert a Fahrenheit temperature reading into a Centigrade temperature reading or vise versa is to enter the accompanying table in the center or boldface column of figures. These figures refer to the temperature in either Fahrenheit or Centigrade degrees. If it is desired to convert from Fahrenheit to Centigrade degrees, consider the center column as a table of Fahrenheit temperatures and read the corresponding Centigrade temperature in the column at the left. If it is desired to convert from Centigrade to Fahrenheit degrees, consider the center column as a table of Centigrade values, and read the corresponding Fahrenheit temperature on the right.

°C		°F	°C		°F	°C		°F	°C		°F
-40.4	-40	-40.0	-11.7	11	51.8	7.8	46	114.8	27.2	81	117.8
-37.2	.35	-31.0	-11.1	12	53.6	8.3	47	116.6	27.8	82	179.6
-34.4	-30	-22.0	-10.6	13	55.4	8.9	48	118.4	28.3	83	181.4
-31.7	-25	-13.0	-10.0	14	57.2	9.4	49	120.2	28.9	84	183.2
-28.9	-20	-4.0	-9.4	15	59.0	10.0	50	122.0	29.4	85	185.0
-28.3	-19	-2.2	-8.9	16	60.8	10.6	51	123.8	30.0	86	186.8
-27.8	-18	-0.4	-8.3	17	62.6	11.1	52	125.6	30.6	87	188.6
-27.2	-17	1.4	-7.8	18	64.4	11.7	53	127.4	31.1	88	190.4
-26.7	-16	3.2	-7.2	19	66.2	12.2	54	129.2	31.7	89	192.2
-26.1	-15	5.0	-6.7	20	68.0	12.8	55	131.0	32.2	90	194.0
-25.6	-14	6.8	-6.1	21	69.8	13.3	56	132.8	32.8	91	195.8
-25.0	-13	8.6	-5.6	22	71.6	13.9	57	134.6	33.3	92	197.6
-24.4	-12	10.4	-5.0	23	73.4	14.4	58	136.4	33.9	93	199.4
-23.9	-11	12.2	-4.4	24	75.2	15.0	59	138.2	34.4	94	201.2
-23.3	-10	14.0	-3.9	25	77.0	15.6	60	140.0	35.0	95	203.0
-22.8	-9	15.8	-3.3	26	78.8	16.1	61	141.8	35.6	96	204.8
-22.2	-8	17.6	-2.8	27	80.6	16.7	62	143.6	36.1	97	206.6
-21.7	-7	19.4	-2.2	28	82.4	17.2	63	145.4	36.7	98	208.4
-21.1	-6	21.2	-1.7	29	84.2	17.8	64	147.2	37.2	99	210.2
-20.6	-5	23.0	-1.1	30	86.0	18.3	65	149.0	37.8	100	212.0
-20.0	-4	24.8	-0.6	31	87.8	18.9	66	150.8	40.6	105	221.0
-19.4	-3	26.6	0	32	89.6	19.4	67	152.6	43.3	110	230.0
-18.9	-2	28.4	0.6	33	91.4	20.0	68	154.4	46.1	115	239.0
-18.3	-1	30.2	1.1	34	93.2	20.6	69	156.2	48.9	120	248.0
-17.8	0	32.0	1.7	35	95.0	21.1	70	158.0	51.7	125	257.0
-17.2	1	33.8	2.2	36	96.8	21.7	71	159.8	54.4	130	266.0
-16.7	2	35.6	2.8	37	98.6	22.2	72	161.6	57.2	135	275.0
-16.1	3	37.4	3.3	38	100.4	22.8	73	163.4	60.0	140	284.0
-15.6	4	39.2	3.9	39	102.2	23.3	74	165.2	62.7	145	293.0
-15.0	5	41.0	4.4	40	104.0	23.9	75	167.0	65.6	150	302.0
-14.4	6	42.8	5.0	41	105.8	24.4	76	168.8	68.3	155	311.0
-13.9	7	44.6	5.6	42	107.6	25.0	77	170.6	71.1	160	320.0
-13.3	8	46.4	6.1	43	109.4	25.6	78	172.4	73.9	165	329.0
-12.8	9	48.2	6.7	44	111.2	26.1	79	174.2	76.7	170	338.0
-12.2	10	50.0	7.2	45	113.0	26.7	80	176.0	79.4	175	347.0

01 GENERAL

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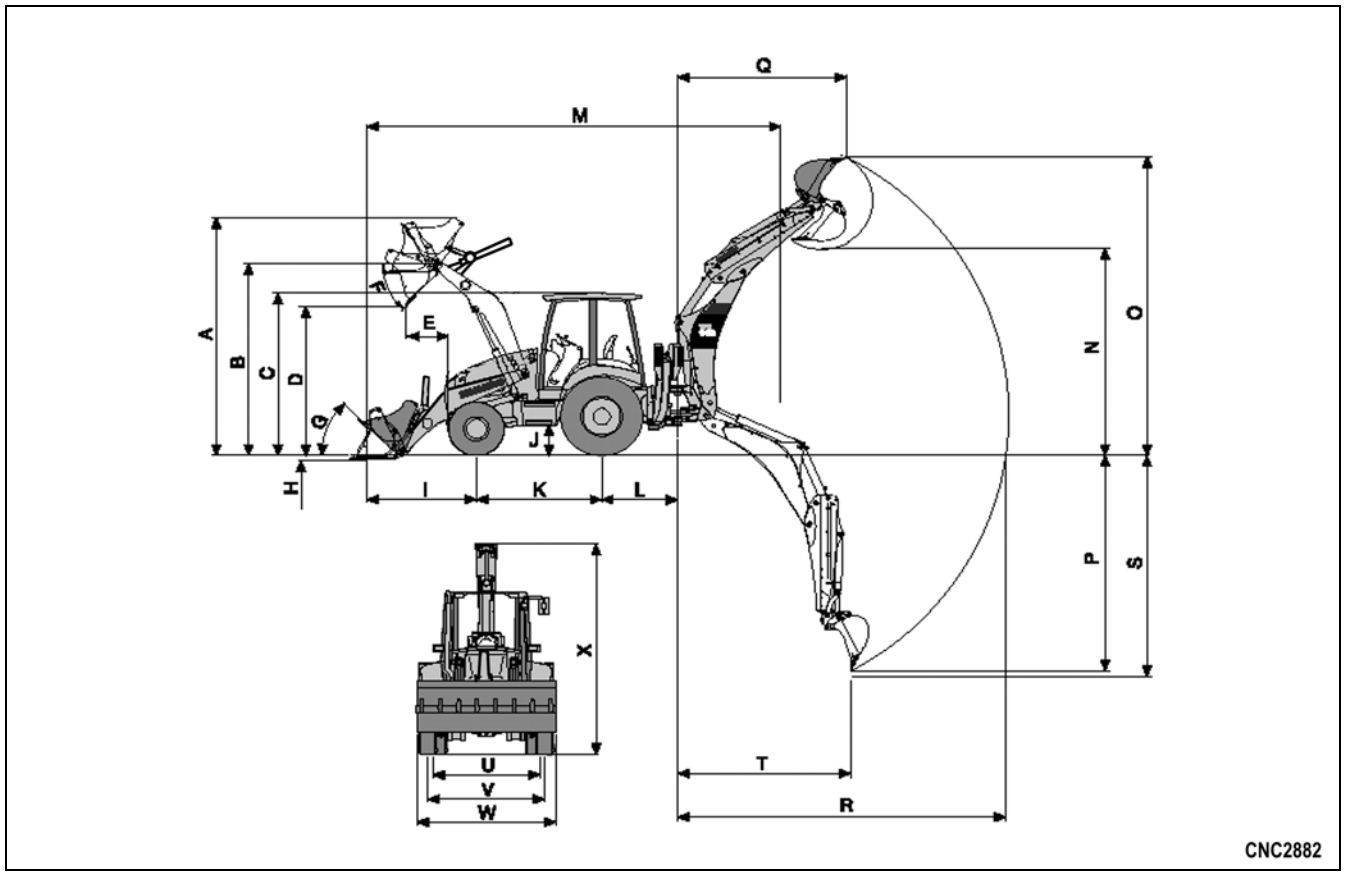
SPECIFICATION DRAWING

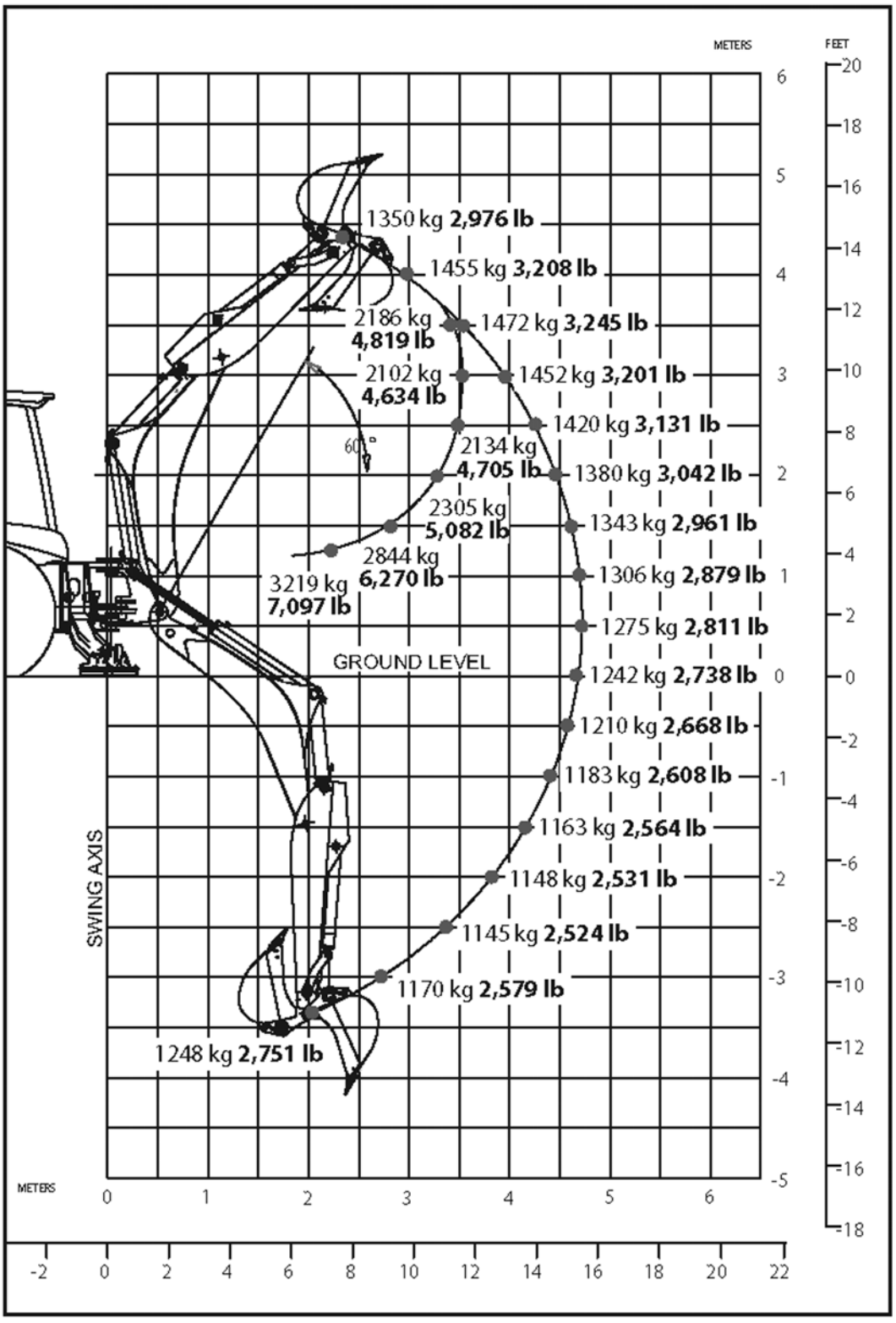
SPECIFICATIONS

MACHINE DIMENSIONS AND WEIGHTS



A	Maximum height	4080mm (**13'5"**)	**M**	Transport length	7060mm (**23'2"**)
B	Hinge pin height	3255mm (**10'8"**)	**N**	Dumping height (SAE)	3600mm (**11'10"**)
C	Overall height, ROPS Canopy	2820mm (**9'4"**)	**O**	Maximum digging height	5210mm (**17'1"**)
D	Maximum dumping height	2615mm (**8'7"**)	**P**	Digging depth (2' level bottom)	4276mm (**14'0"**)
E	Reach at maximum height and 45° dump angle	910mm (**3'0"**)	**Q**	Reach at maximum height	2640mm (**8'8"**)
F	Dumping angle	45°	**R**	Maximum reach	5580mm (**18'4"**)
G	Rollback angle	45°	**S**	Maximum digging depth	4318mm (**14'2"**)
H	Digging depth	100mm (**4'0"**)	**T**	Digging reach	2380mm (**7'10"**)
I	Bucket reach (transport)	1900mm (**6'3"**)	**U**	Rear tread	1680mm (**5'6"**)
J	Ground clearance	380mm (**1'3"**)	**V**	Front tread	1780mm (**5'10"**)
K	Wheel base	2175mm (**7'2"**)	**W**	Overall width (with bucket)	2180mm (**7'2"**)
L	Backhoe swing center distance	1175mm (**3'10"**)	**X**	Backhoe transport height	3660mm (**12'0"**)

BACKHOE ARM



CNC2883

MACHINE SYSTEMS SPECIFICATIONS

ENGINE

Model ..... Komatsu 4D102LE-2
Type ..... Water-cooled, in line 4-cycle
Aspiration ..... Naturally
Number of cylinders 4
Bore x stroke ..... 102 x 138 mm (4.02 x 5.43 in)
Piston displacement ..... 4.5 ltr (275 in^3)
Compression ratio 18:1

- Horsepower rating @ 2200 rpm (WB142-5)

Gross horsepower ..... 60 kW 80 HP
Net horsepower (SAE J 1349) ..... 57 kW 76 HP
Max. torque @ 1300 rpm ..... 298 N·m (221 lbf ft)
Fuel system ..... Direct injection
Air cleaner ..... Dry-type with safety element

- Lubrication system

Method ..... Gear pump, force-lubrication
Filter ..... Full-flow

- Cooling system

Type ..... Radiator water cooled system

- Starting system

Type ..... Electric motor with air pre-heating system for cold climate

ELECTRICAL SYSTEM

Voltage 12V
Battery ..... 100 Ah (860 CCA)
Alternator 95A
Starter motor ..... 3.0 kw

SERVICE REFILL CAPACITIES

Engine oil ..... 9 ltr (2.4 gal)
Cooling system ..... 14 ltr (3.7 gal)
Fuel tank ..... 120 ltr (31.7 gal)
Hydraulic tank ..... 41 ltr (10.8 gal)
Hydraulic system capacities ..... 97 ltr (25.6 gal)
Front axle oil ..... 7.0 ltr (1.9 gal)
Rear axle oil ..... 14.5 ltr (3.8 gal)
Gearbox oil, Power Shuttle ..... 18.0 ltr (4.8 gal)

TRANSMISSION

Shifting between 2WD and 4WD is achieved through an electrohydraulic system.

- The transmission is operated through a torque converter and a power shift reversing shuttle.
- The mechanical 4-speed gearbox is synchronized.

Calculated with standard tires and engine at 2,200 rpm.

	FORWARD				REVERSE			
Gears	**1st**	**2nd**	**3rd**	**4th**	**1st**	**2nd**	**3rd**	**4th**
km/h	5.2	8.5	18.5	37.0	5.2	8.5	18.5	37.0
m/h	3.2	5.3	11.5	23.0	3.2	5.3	11.5	23.0

TOTAL MASS

Maximum total mass . . . . . 7,298 kg (16,090 lb)

STANDARD BUCKET CAPACITY

Bucket breakout force (ISO 6015) . . . . . 5,150 kg (11,351 lb)
Arm breakout force . . . . . 3,550 kg (7,670 lb)
Front bucket capacity . . . . . (SAE) 0.77 m^3 (1.0 yd^3)
Backhoe bucket capacity . . . . . (SAE) 0.20 m^3 (0.24 yd^3)

LOADER

Standard bucket width . . . . . 2,180 mm (7 ft 2 in)
Standard bucket capacity (SAE) . . . . . 0.77 m^3 (6,00 yd^3)
Standard bucket weight . . . . . 410 kg (904 lb)
Lifting capacity at maximum height . . . . . 2,870 kg (6,325 lb)
Lifting capacity at ground level . . . . . 3,670 kg (8,089 lb)
Breakout force . . . . . 4,590 kg (10,116 lb)

TIRE PRESSURE

Front tire: 12 x 16.5 R4, 12 ply . . . . . 4.57 kg/cm^2 (65 psi)
Rear tire: 16.9 x 24 R4, 12 ply . . . . . 2.60 kg/cm^2 (37 psi)

WEIGHT TABLE

★ This Weight Table is for reference when handling components or when transporting the machine.

Unit: kg (lb)

Machine model	WB142-5
Engine assembly - Muffler and exhaust pipe	400 (882)
Radiator	37 (82)
Hydraulic oil tank (empty)	10 (22)
Fuel tank (empty)	62 (137)
Front counter weight	170 (375)
Engine hood	32 (71)
Canopy (without seat)	580 (1,279)
Seat	23 (51)
Engine - transmission - pump	682 (1,504)
Hydraulic pump	31.5 (69.4)
Transmission	232 (511)
Front axle	262 (578)
Rear axle	430 (948)
Front wheel (complete with rim)	52 (115)
Rear wheel (complete with rim)	126 (357)
Work equipment (front loader)	1,100 (2,425)
Boom	313 (690)
Bucket	436 (961)
Bucket cylinder (mono-link)	13x1
Boom cylinder	46x2
2-spool control valve	24 (53)
3-spool control valve	30 (66)
Backhoe work equipment	750 (1,653)
6-spool control valve	47 (104)
7-spool control valve	53 (117)
8-spool control valve	59 (130)
Backhoe boom cylinder	248 (547)
Backhoe arm cylinder	305 (672)
Backhoe swing frame	162.5 (358.3)
Outriggers	39x2
Boom cylinders	87.5 (193)
Arm cylinders	67 (148)
Bucket cylinders	52.5 (116)
Outrigger cylinders	27.5x2
Swing cylinders	34x2
Bucket	158 (348)

FUEL, COOLANT, AND LUBRICANTS

PROPER SELECTION ACCORDING TO THE AMBIENT TEMPERATURE

Reservoir	Type of fluid	Ambient Temperature	Capacity	
		-22°F -30° C / -4 -20 / 14 -10 / 32 0 / 50 10 / 68 20 / 86 30 / 104 40 / 122 50	Specified	Refill
Engine oil pan	Oil API CI-4	SAE 5W-30 / SAE 10W 30 / SAE 15W-40	9 liter (2.4 gal)	9 liter (2.4 gal)
Hydraulic system		SAE 5W* / SAE 10W / SAE 30 / SAE 10W-30	97 liter (25.6 gal)	41 liter (10.8 gal)
Hydraulic system with biodegradable oil		See page 3-12	97 liter (25.6 gal)	41 liter (10.8 gal)
Front axle: Differential			6.5 liter (1.7 gal)	6.5 liter (1.7 gal)
Final reduction gear (ea.)		(See Note 1)	1 liter (0.26 gal)	1 liter (0.26 gal)
Rear axle: Differential			14.5 liter (3.8 gal)	14.5 liter (3.8 gal)
Final reduction gear (ea.)			1.5 liter (0.4 gal)	1.5 liter (0.4 gal)
Hydraulic transmission	GM DEXRON II D		20 liter (5.3 gal)	17 liter (4.5 gal)
Brake system			0.8 liter (0.2 gal)	0.8 liter (0.2 gal)
Fuel tank	Diesel fuel	ASTM D975 No. 1 / ASTM D975 No. 2	120 liter (31.7 gal)	-
Cooling system	Coolant	Ethylene Glycol Base	14 liter (3.7 gal)	-

OPTION FOR VERY COLD AREAS: If the temperature exceeds 10° C (50° F), contact your Komatsu distributor for advise on the type of oil to be used.

GREASE

Lubrication Points	Consistency	Type
Articulations, grease fittings	NLGI 2	(See note 2)

Note 1:For axle oil, use only the recommended oil as follows.

SHELL:	DONAX TD
CALTEX:	RPM TRACTOR HYDRAULIC FLUID
CHEVRON:	TRACTOR HYDRAULIC FLUID
TEXACO:	TEXTRAN TDH OIL
MOBIL:	MOBILFLUID 422 or 424

Note 2: The recommended lubricating grease is No.2 multi-purpose lithium grease with 3% molybdenum disulfide (Lithio EP + MoS2).

FUEL AND ENGINE OIL REMARKS

- When fuel sulphur content is less than 0.5%, change oil in the oil pan every periodic maintenance hours described in this manual. Change oil according to the following table if fuel sulphur content is above 0.5%.

Fuel sulphur content	Change interval of oil in engine oil pan
0.5 to 1.0%	1/2 of regular interval
Above 1.0%	1/4 of regular interval

- When starting the engine in an atmospheric temperature of lower than 0°C (32°F), be sure to use engine oil of SAE10W, SAE20W-20 and SAE10W-30, even though an atmospheric temperature goes up to 10°C (18°F) more or less in the day time.
- Use API classification CI-4.
- There is no problem if single grade oil is mixed with multigrade oil (SAE10W-30, 10W-40), but be sure to add single grade oil that matches the temperature in the table.
- Use Komatsu genuine oil which has been specifically formulated and approved for use in the engine, hydraulic work equipment, transmission, axles, and brakes.

Specified capacity: Total amount of oil including oil for components and oil in piping.

Refill capacity: Amount of oil needed to refill system during normal inspection and maintenance.

ASTM: American Society of Testing and Material
SAE: Society of Automotive Engineers
API: American Petroleum Institute

HOMOLOGATED (HEES) SYNTHETIC LUBRICANTS

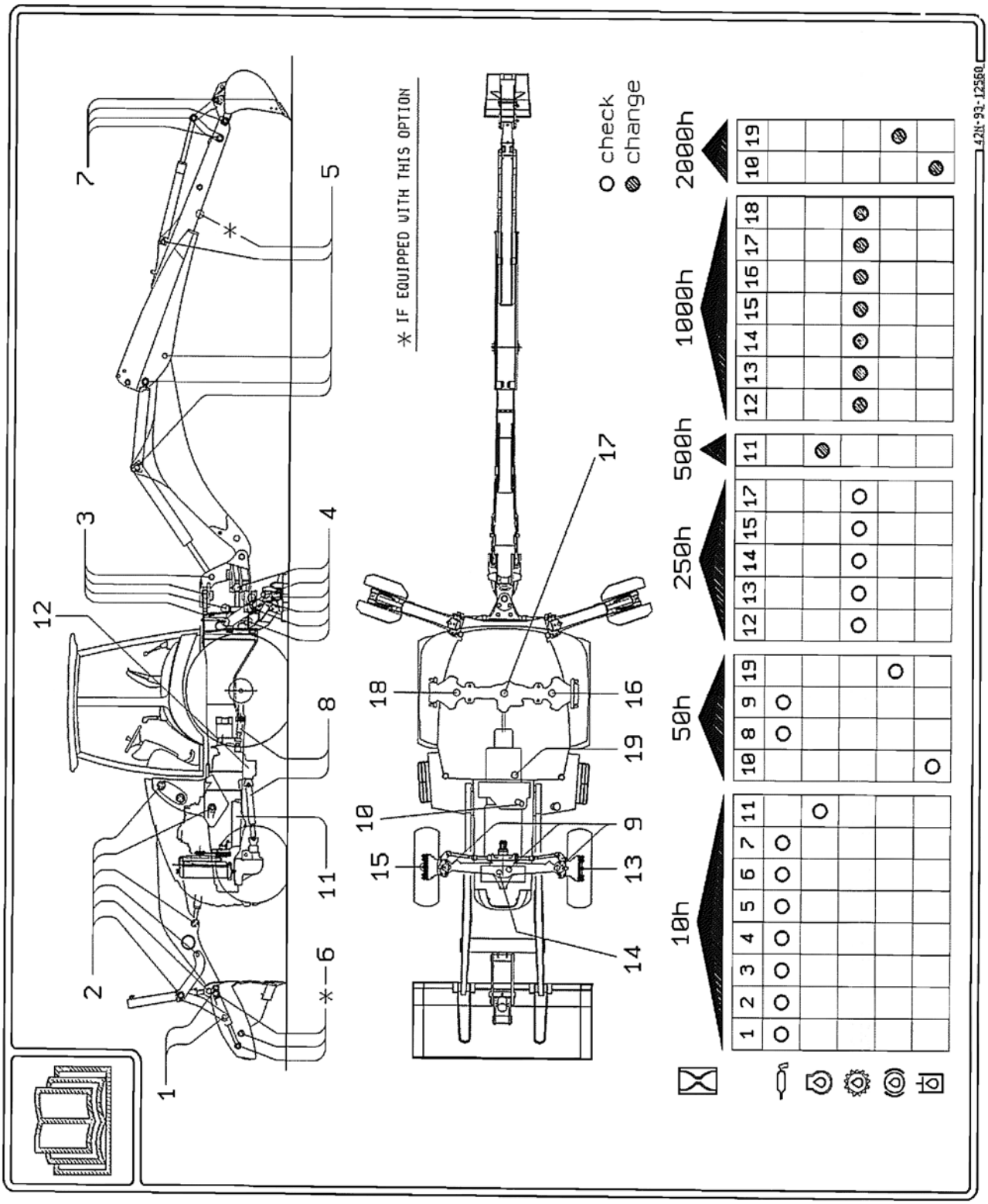
Our machines can be filled with synthetic biodegradable hydraulic oil type HEES not of plant origin, therefore use of oils indicated in the following table is authorized and recommended:

Supplier	HEES Synthetic Biodegradable Oil
KOMATSU	---
AGIP	ARNICA S 46
ARAL	HEF 46 vitam
AVIA	SYNTOFLUID N 46
BP	BIOHYD SE-S 46
CONDAT	CONDAT D 46 K
ELF	HYDRELF BIO 46
ESSO	HYDRAULIKOIL HE 46
FINA	BIOYIDRAN TMP 46 SE 46
FUCHS	PLANTOHYD S 46
KENDALL	SYNTH NATURA 46 HV
KUWAIT PETROLEUM K8	HOLBEIN 46
MOBIL	EAL SYNDRAULIC
MOBIL (USA)	ENVIROSYN 46 H
PAKELO	GEOLUBE HYDRAULIC EP-46
PANOLIN	HLP SYNTH 46
SHELL	NATURELLE HFE-46
TAMOIL	GREEN HYDRO SAFETY 46
TEXACO	HYDRA 46
TOTAL	EQUIVIS BIO 46
VAVOLINE	UNISYN HLP 32/68

- **It Is not possible to mix the synthetic biodegradable oil type HEES with ordinary hydraulic oils, since when the temperature increases insoluble compounds are generated, which are deposited on the filters and clog them (the maximum concentration of ordinary oil cannot exceed 1% of the total quantity of oil).**
- **The synthetic biodegradable oil can be used only in the hydraulic system; it cannot be used for the endothermic motor, the transmissions, the braking system, etc.**
- **Before introducing the synthetic biodegradable oil in the hydraulic system, empty the system completely, disconnecting the cylinders and all the parts that may contain ordinary oil, and replace the drain filter with a new one. Start the engine and let it idle without using the work equipment, wait until the oil reaches a temperature of at least 40°C (104°F), then start moving the equipment, so that all the parts of the system are filled with oil. Stop the engine and check the oil level.**

LUBRICATION DIAGRAMS

GENERAL VIEW



Remark

Use only recommended oil and grease.