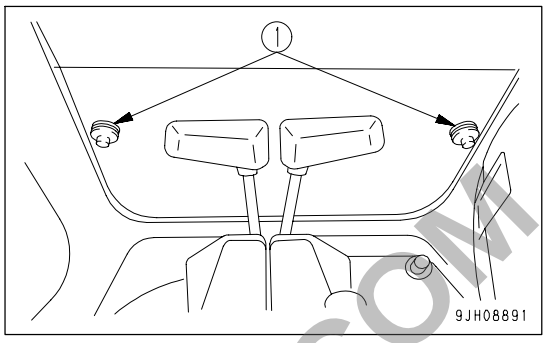
Removing Lower Windshield

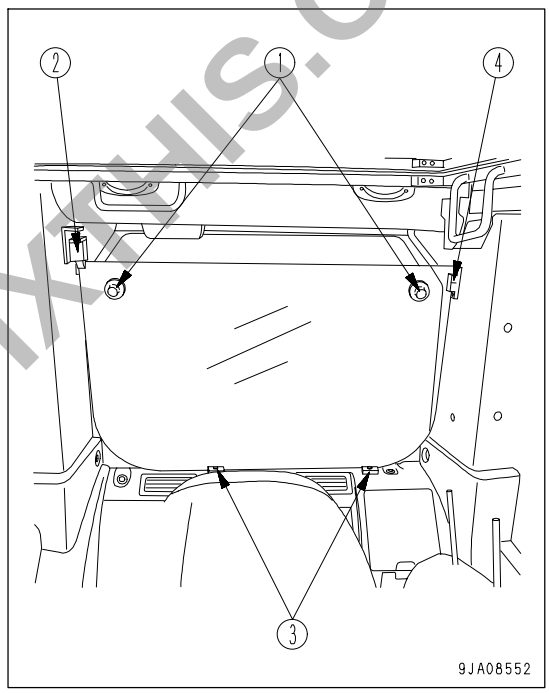
1. Open the front window, then hold grip (1), pull up, and remove the bottom window.



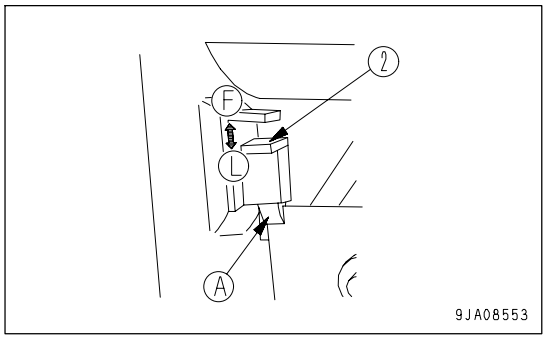
2. After removing the bottom window, store it at the rear of the operator's cab and lock it securely with lock (2). The procedure for stowing is as follows.

   1) Set it with the protruding part of grip (1) on the glass on the inside and insert the bottom of the glass into the groove in seat (3).

   2) Insert the top right of the glass into the groove in seat (4).



   3) Push lock (2) to the free position (F). Tooth (A) will come up, so push the glass against it, then release lock (2) and secure the top of the glass.
   When lock (2) is released, it will return to LOCK position (L) and tooth (A) will go down.



NOTICE

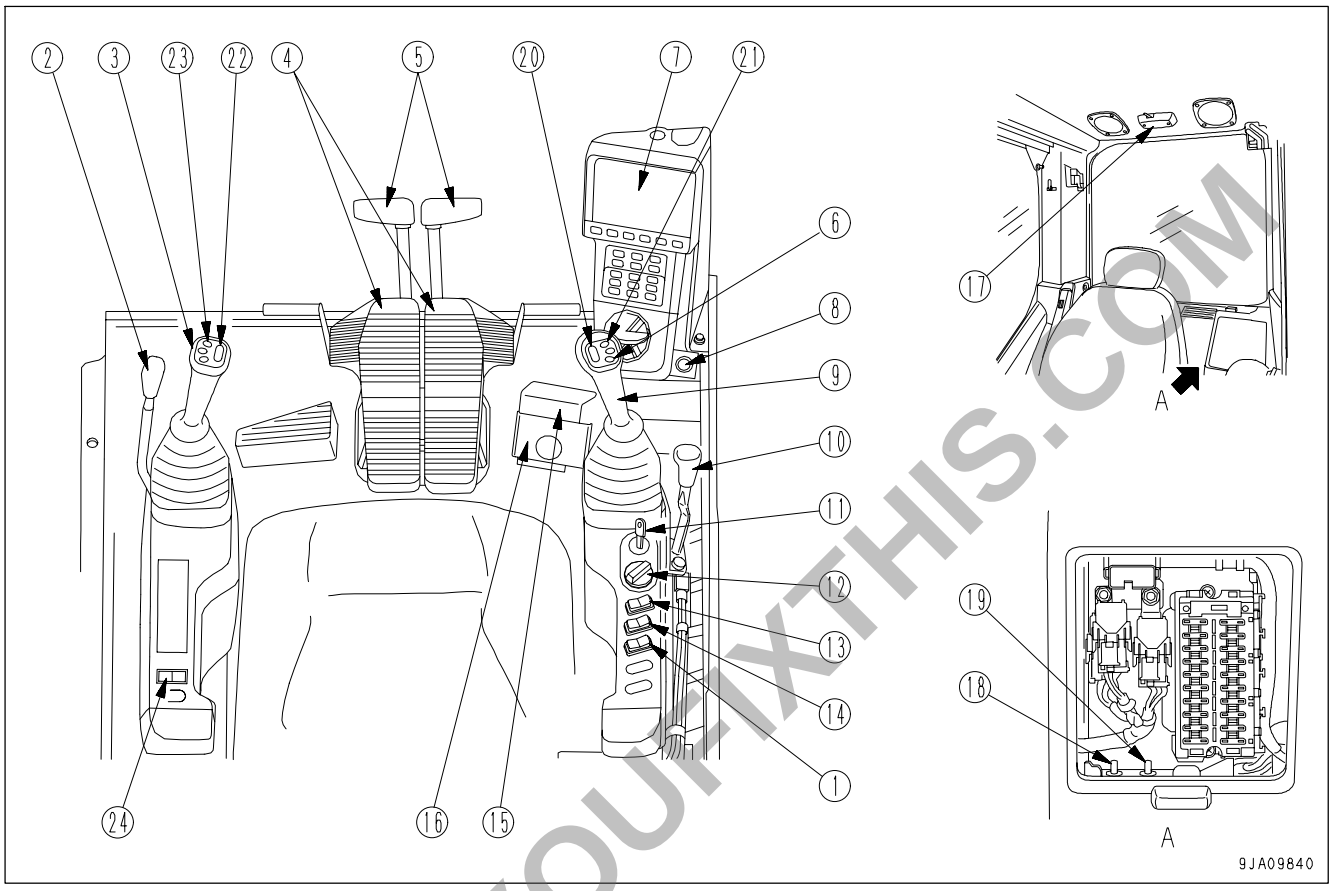
When stowing the glass, lock it securely and check that there is no play. If there is play or the lock is not properly applied, there is danger that the glass may fall.

   4) When removing the bottom window from the stowing position, carry out the stowing procedure in the reverse order.

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CONTROLS AND GAUGES



(1) Cab additional lamp switch (if equipped)
(2) Lock lever
(3) Left work equipment control lever
(4) Travel pedals
(5) Travel levers
(6) Horn switch
(7) Machine monitor
(8) Cigarette Lighter
(9) Right work equipment control lever
(10) Blade control lever
(11) Starting switch
(12) Fuel control dial
(13) Lamp switch
(14) Revolving warning lamp switch (if equipped)
(15) Swing lock cover
(16) Boom swing control pedal
(17) Room Lamp Switch
(18) Emergency pump drive switch
(19) Swing parking brake release switch
(20) 1st-line attachment proportional switch
(21) Breaker operation switch
(22) 2nd-line attachment proportional switch (if equipped)
(23) Quick coupler operation switch (if equipped)
(24) Quick coupler main switch (if equipped)

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MAINTENANCE SCHEDULE

If the machine is equipped with a hydraulic breaker, the maintenance schedule for some parts will be different. For details, see "MAINTENANCE INTERVAL FOR HYDRAULIC BREAKER (PAGE 4-16)" to confirm the correct maintenance schedule when carrying out maintenance.

MAINTENANCE SCHEDULE CHART

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TIGHTENING TORQUE SPECIFICATIONS

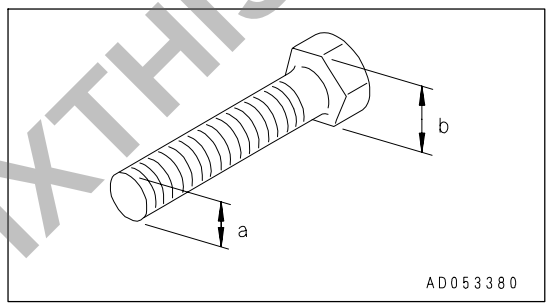
TIGHTENING TORQUE LIST

CAUTION

If nuts, bolts, or other parts are not tightened to the specified torque, it will cause looseness or damage to the tightened parts, and this will cause failure of the machine or problems with operation.
Always pay careful attention when tightening parts.

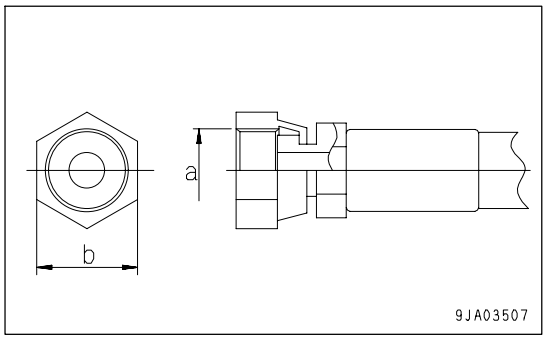
Unless otherwise specified, tighten the metric nuts and bolts to the torque shown in the table below.
If it is necessary to replace any nut or bolt, always use a Komatsu genuine part of the same size as the part that was replaced.

Thread diameter of bolt (a)(mm)	Width across flats (b)(mm)	Tightening torque					
		Target value			Service limit		
		Nm	kgm	lbft	Nm	kgm	lbft
6	10	13.2	1.35	9.8	11.8-14.7	1.2-1.5	8.7-10.8
8	13	31	3.2	23.1	27-34	2.8-3.5	20.3-25.3
10	17	66	6.7	48.5	59-74	6.0-7.5	43.4-54.2
12	19	113	11.5	83.2	98-123	10.0-12.5	72.3-90.4
14	22	172	17.5	126.6	153-190	15.5-19.5	112.1-141
16	24	260	26.5	191.7	235-285	23.5-29.5	170.0-213.4
18	27	360	37	267.6	320-400	33.0-41.0	238.7-296.6
20	30	510	52.3	378.3	455-565	46.5-58.0	336.3-419.5
22	32	688	70.3	508.5	610-765	62.5-78.0	452.1-564.2
24	36	883	90	651	785-980	80.0-100.0	578.6-723.3
27	41	1295	132.5	958.4	1150-1440	118.0-147.0	853.5-1063.3
30	46	1720	175.0	1265.8	1520-1910	155.0-195.0	1121.1-1410.4
33	50	2210	225.0	1627.4	1960-2450	200.0-250.0	1446.6-1808.3
36	55	2750	280.0	2025.2	2450-3040	250.0-310.0	1808.3-2242.2
39	60	3280	335.0	2423.1	2890-3630	295.0-370.0	2133.7-2676.2



Apply the following table for Hydraulic Hose.

Nominal-No. of threads (a)	Width across flats (b) mm	Tightening torque					
		Target valve			Parmissible range		
		Nm	kgm	lbft	Nm	kgm	lbft
9/16 -18UNF	19	44	4.5	32.5	34 - 54	3.5 - 5.5	25.3 - 39.8
11/16 -16UN	22	74	7.5	54.2	54 - 93	5.5 - 9.5	39.8 - 68.7
13/16 -16UN	27	103	10.5	75.9	84 - 132	8.5 - 13.5	61.5 -97.6
1 -14UNS	32	157	16.0	115.7	128 - 186	13.0 - 19.0	94.0 - 137.4
1`3/16 -12UN	36	216	22.0	159.1	177 - 245	18.0 - 25.0	130.2 - 180.8



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OTHER TROUBLE

Electrical System

- ( ): Always contact your Komatsu distributor when dealing with these items.
- In cases of problems or causes which are not listed below, contact your Komatsu distributor for repairs.

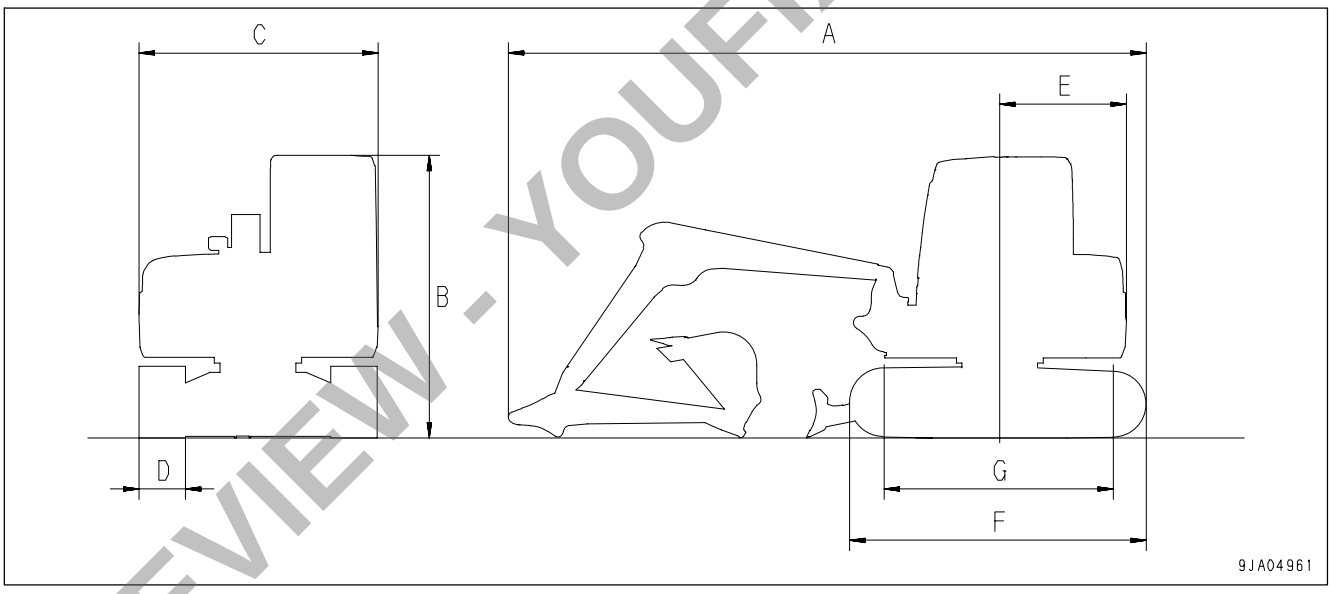
Problem	Main causes	Remedy
Lamp does not glow brightly even when the engine runs at high speed	• Defective wiring, deterioration of battery	(• Check, repair loose terminals, disconnections, replace battery)
Lamp flickers while engine is running	• Loose fan belt	(• Replace fan belt, Check tension)
Charge level monitor does not go out even when engine is running	• Defective alternator • Defective wiring	(• Replace) (• Check, repair)
Abnormal noise is generated from alternator	• Defective alternator	(• Replace)
Starting motor does not turn when starting switch is turned to ON	• Defective wiring • Defective starting motor • Insufficient battery charge	(• Check, repair) (• Replace) • Charge
Pinion of starting motor keeps going and out	• Insufficient battery charge • Defective safety relay	• Charge (• Replace)
Starting motor turns engine sluggishly	• Insufficient battery charge • Defective starting motor	• Charge (• Replace)
Starting motor disengages before engine starts	• Defective wiring, defective ring gear pinion • Insufficient battery charge	(• Check, repair) • Charge
Engine pre-heating monitor does not light	• Defective wiring • Defective heater relay • Defective monitor	(• Check, repair) (• Replace) (• Replace)
Oil pressure monitor does not light up when engine is stopped (starting switch at ON position)	• Defective monitor • Defective caution lamp switch	(• Replace) (• Replace)
Outside of electrical heater is not warm when touched by hand	• Defective wiring • Disconnection in electric heater • Defective operation of heater	(• Check, repair) (• Replace) (• Replace)
Travel alarm does not sound when travel lever is operated	• Defective wiring • Defective alarm • Defective travel PPC pressure sensor	(• Check for loose connector terminals or disconnection, repair) (• Replace) (• Replace)
Starting motor turns but engine does not start	• Defective engine controller power supply circuit • Defective relay • Defective connector at engine end	(• Replace) (• Replace) (• Check for loose, missing connectors or disconnection, repair)

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SPECIFICATIONS

	Item	Unit	Steel shoe specified
	Operating weight (blade specified)	kg (lb)	8,150 (19,971)
	Bucket capacity	m^3 (cu/yd)	0.28 (0.37)
	Name of engine	-	Komatsu SAA4D95LE diesel engine
	Engine horsepower	kW (HP)/rpm	48.5 (65.0)/1,950
A	Overall length	mm (ft in)	6,175 (20' 3")
B	Overall height	mm (ft in)	2,730 (8' 11")
C	Overall width	mm (ft in)	2,330 (7' 8")
D	Track width	mm (ft in)	450 (1' 6")
E	Radius of upper structure	mm (ft in)	1,335 (4' 5")
F	Length of track	mm (ft in)	2,840 (9' 4")
G	Tumbler canter distance	mm (ft in)	2,235 (7' 4")
	Min. ground clearance	mm (ft in)	360 (1' 2")
	Travel speed (Low/High)	km/h (MPH)	2.9/5.1 (1.8/3.2)
	Continuous swing speed	rpm	10.0



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ATTACHMENTS AND OPTIONS - GENERAL INFORMATION

SAFETY FIRST

If attachments or options other than those authorized by Komatsu are installed, this will not only affect the life of the machine, but will also cause problems with safety.

When installing attachments not listed in this Operation and Maintenance Manual, contact your Komatsu distributor first.

If you do not contact Komatsu, we cannot accept any responsibility for any accidents or failures.

⚠ WARNING

General precautions

- **Read the instruction manual for the attachment thoroughly, and do not use this attachment unless you are sure that you have understood the guides completely.**
  If you lose the instruction manual, always ask the manufacturer or your Komatsu distributor for a new copy.
- **Depending on the attachment, install the necessary front guard on the machine.**
- **Depending on the attachment, the impact noise may make it difficult for fellow workers to transmit instructions for the operation. Before starting operation, decide a leader and determine the signals to be used.**
- **Do not carry out swinging operations to the side with a heavy load on the attachment. This is particularly dangerous on slopes.**
- **Comparing with a machine equipped with a bucket, a machine equipped with a breaker has a heavy load at the front of the work equipment and is unstable. To avoid a hazard of tipping over, do not carry out operations with the attachment swung to the side.**
- **When an attachment is installed, the swing range and center of gravity of the machine are different, and the machine may move in an unexpected way. Be sure that you understand the condition of the machine properly.**
- **Before starting operations, set up a fence around the machine to prevent people from entering.**
  Never operate the machine when there are people near the machine.
- **To prevent serious accidents caused by misoperation, do not put your foot on the pedal except when operating the pedal.**

Precautions for removal and installation operations

When removing or installing the attachments, obey the following precautions and take care to ensure safety during the operation.

- **Carry out the removal and installation operation on a flat, firm ground surface.**
- **When the operation is carried out by two or more workers, determine the signals and follow these during the operation.**
- **When carrying heavy objects (more than 25 kg or 55 lb), use a crane.**
- **When removing heavy parts, always support the part before removing it.**
  When lifting such as heavy parts with a crane, always pay careful attention to the position of the center of gravity.
- **It is dangerous to carry out operations with the load kept suspended. Always set the load on a stand, and check that it is safe.**
- **When removing or installing attachments, make sure that it is in a stable condition and will not fall over.**
- **Never go under a load suspended from a crane.**
  Always stand in a position that is safe even if the load should fall.

NOTICE

Qualifications are required to operate a crane. Never allow the crane to be operated by an unqualified person.

For details of removal and installation operations, contact your Komatsu distributor.

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SAFETY INFORMATION

To enable you to use this machine safely, safety precautions and labels are given in this manual and affixed to the machine to give explanations of situations involving potential hazards and of the methods of avoiding such situations.

Signal words

The following signal words are used to inform you that there is a potential hazardous situation that may lead to personal injury or damage.
In this manual and on machine labels, the following signal words are used to express the potential level of hazard.

⚠ DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. This word is used also to alert against unsafe practices that may cause property damage.

Example of safety message using signal word

⚠ WARNING

When standing up from the operator's seat, always place the lock lever in the LOCK position.
If you accidentally touch the control levers when they are not locked, this may cause a serious injury or death.

Other signal words

In addition to the above, the following signal words are used to indicate precautions that should be followed to protect the machine or to give information that is useful to know.

NOTICE This word is used for precautions that must be taken to avoid actions which could shorten the life of the machine.

REMARKS This word is used for information that is useful to know.

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EMISSION CONTROL WARRANTY

EMISSION CONTROL WARRANTY STATEMENT (APPLIES TO CANADA ONLY)

1. **Products Warranted**

Komatsu America International Company, Komatsu Mining Systems Inc. and Komatsu Utility Corporation (collectively "Komatsu") produce and/or market products under brand names of Komatsu, Dresser, Dressta, Haulpak and Galion. This emissions warranty applies to new engines bearing the Komatsu name installed in these products and used in Canada in machines designed for industrial off-highway use. This warranty applies only to these engines produced on or after January 1, 2000. This warranty will be administered by Komatsu distribution in Canada.

2. **Coverage**

Komatsu warrants to the ultimate purchaser and each subsequent purchaser that the engine is designed, built and equipped so as to conform, at the time of sale by Komatsu, with all U.S. Federal emission regulations applicable at the time of manufacture and that it is free from defects in workmanship or material which would cause it not to meet these regulations within five years or 3,000 hours of operation, whichever occurs first, as measured from the date of delivery of the engine to the ultimate purchaser.

3. **Limitations**

Failures, other than those resulting from defects in materials or workmanship, are not covered by this warranty. Komatsu is not responsible for failures or damage resulting from what Komatsu determines to be abuse or neglect, including, but not limited to: operation without adequate coolant or lubricants; over fueling; over speeding; lack of maintenance of lubricating, cooling or intake systems; improper storage, starting, warm-up, run-in or shutdown practices; unauthorized modifications of the engine. Komatsu is also not responsible for failures caused by incorrect fuel or by water, dirt or other contaminants in the fuel. Komatsu is not responsible for non-engine repairs, "downtime" expense, related damage, fines, all business costs or other losses resulting from a warrantable failure.

KOMATSU IS NOT RESPONSIBLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

This warranty, together with the express commercial warranties, are the sole warranties of Komatsu. **THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICUALR PURPOSE.**

GARANTIE SUR LE CONTRÔLE DES ÉMISSIONS

ÉNONCÉ DE GARANTIE SUR LE CONTRÔLE DES ÉMISSIONS (APPLICABLE AU CANADA SEULEMENT):

1. **Produits garantis:**

Komatsu America International Company, Komatsu Mining Systems Inc. et Komatsu Utility Corporation (collectivement Komatsu) produisent et/ou font la mise en marché de produits portant les noms de marque Komatsu, Dresser, Dressta, Haulpak et Galion. Cette garantie sur les émissions s'applique à tous les nouveaux moteurs portant le nom Komatsu, installés dans ces produits et utilisés au Canada dans des machines conçues pour utilisation industrielle non-routière. Cette garantie s'applique seulement sur les moteurs produits à partir du 1er Janvier 2000. Cette garantie sera administrée par la distribution de Komatsu au Canada.

2. **Couverture:**

Komatsu garantit à l'acheteur ultime et chaque acheteur subséquent que le moteur est conçu, construit et équipé en toute conformité, au moment de la vente par Komatsu, avec toutes les Réglementations fédérales américaines sur les émissions applicables au moment de la fabrication et qu'il est exempt de défauts de construction ou de matériaux qui auraient pour effet de contrevenir à ces réglementations en dedans de 5 ans ou 3000 heures d'opération, mesuré à partir de la date de livraison du moteur au client ultime.

3. **Limitations:**

Les bris, autres que ceux résultant de défauts de matériaux ou de construction, ne sont pas couverts par cette Garantie. Komatsu n'est pas responsable pour bris ou dommages résultant de ce que Komatsu détermine comme étant de l'abus ou négligence, incluant mais ne se limitant pas à: l'opération sans lubrifiants ou agent refroidissants adéquats; la suralimentation d'essence; la survitesse; le manque d'entretien des systèmes de lubrification, de refroidissement ou d'entrée; de pratiques non-propices d'entreposage, de mise en marche, de réchauffement, de conditionnement ou d'arrêt; les modifications non-autorisées du moteur. De plus, Komatsu n'est pas responsable de bris causés par de l'essence inadéquate ou de l'eau, des saletés ou autres contaminants dans l'essence. Komatsu n'est pas responsable des réparations non-reliées au moteur, des dépenses encourues suite aux temps d'arrêts, des dommages relatifs, amendes, et de tout autre coût d'affaires ou autres pertes résultant d'un bris couvert par la garantie.

KOMATSU N'EST PAS RESPONSABLE DES INCIDENTS OU DOMMAGES CONSÉQUENTS.

Cette garantie, ainsi que les garanties expresses commerciales, sont les seules garanties de Komatsu. **IL N'Y A AUCUNE AUTRE GARANTIE, EXPRESSE OU SOUS-ENTENDUE, MARCHANDABLE OU PROPICE A UNE UTILISATION PARTICULIÈRE.**

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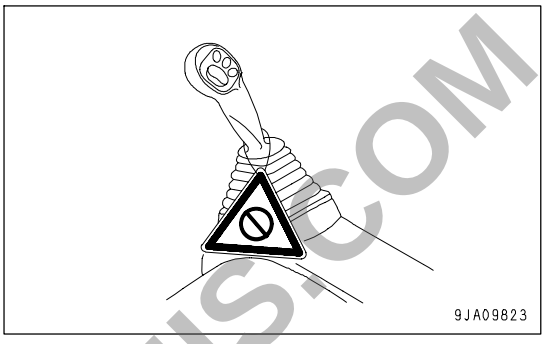
PRECAUTIONS FOR MAINTENANCE

PRECAUTIONS BEFORE STARTING INSPECTION AND MAINTENANCE

DISPLAY WARNING TAG DURING INSPECTION AND MAINTENANCE

If there is any "DANGER! Do NOT operate!" warning tag displayed, it means that someone is carrying out inspection and maintenance of the machine. If the warning sign is ignored and the machine is operated, there is danger that the person carrying out inspection or maintenance may be caught in the rotating parts or moving parts and suffer serious personal injury or death. Do not start the engine or touch the levers.

- If necessary, put up signs around the machine also.
  Warning tag part number: 09963-A1640
  When not using this warning tag, keep it in the toolbox.
  If there is no toolbox, keep it in the pocket for the Operation and Maintenance Manual





KEEP WORKPLACE CLEAN AND TIDY

- Do not leave hammers or other tools lying around in the work place. Wipe up all grease, oil, or other substances that will cause you to slip. Always keep the work place clean and tidy to enable you to carry out operations safely. If the work place is not kept clean and tidy, there is the danger that you will trip, slip, or fall over and injure yourself.
- When cleaning the ceiling window which is made of organic glass (polycarbonate), use tap water and avoid use of organic solvents for cleaning. An organic solvent like benzene, toluene or methanol can invite a chemical reaction like dissolution and decomposition on the window glass, deteriorating polycarbonate in use.

SELECT SUITABLE PLACE FOR INSPECTION AND MAINTENANCE

- Stop the machine on firm, level ground.
- Select a place where there is no hazard of landslides, falling rocks, or flooding.

ONLY AUTHORIZED PERSONNEL

Do not allow any unauthorized personnel into the area when servicing the machine. If necessary, employ a guard.

APPOINT LEADER WHEN WORKING WITH OTHERS

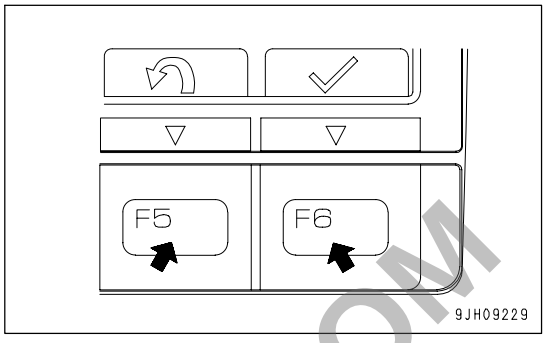
- When repairing the machine or when removing and installing the work equipment, appoint a leader and follow his instructions during the operation.

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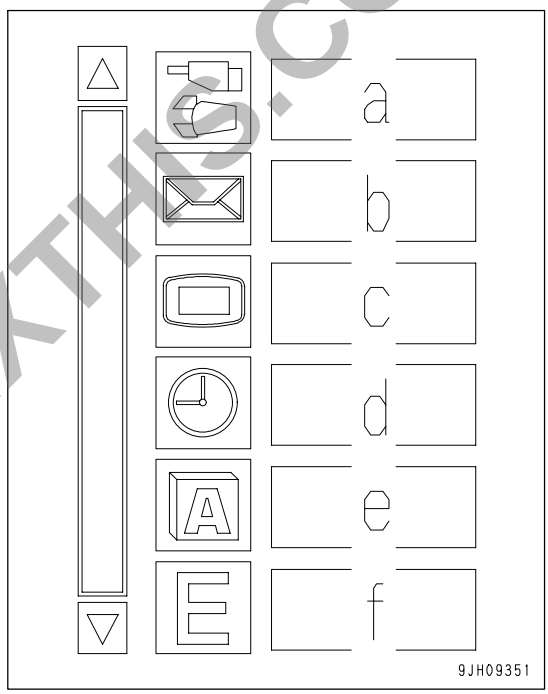
F5: Returns to standard screen.
F6: Switches to setting screen for selected item.

- If no switch is operated for 30 seconds on the user menu screen, the screen automatically returns to the previous screen.



- The following items can be set.

a: Breaker/attachment setting
(machines ready for installation of attachment)
b: Message display
(machines equipped with KOMTRAX)
c: Screen adjustment
d: Clock adjustment
e: Language selection
f: Economy mode adjustment



The operation for setting a to f is as follows.

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ENGINE HOOD

WARNING

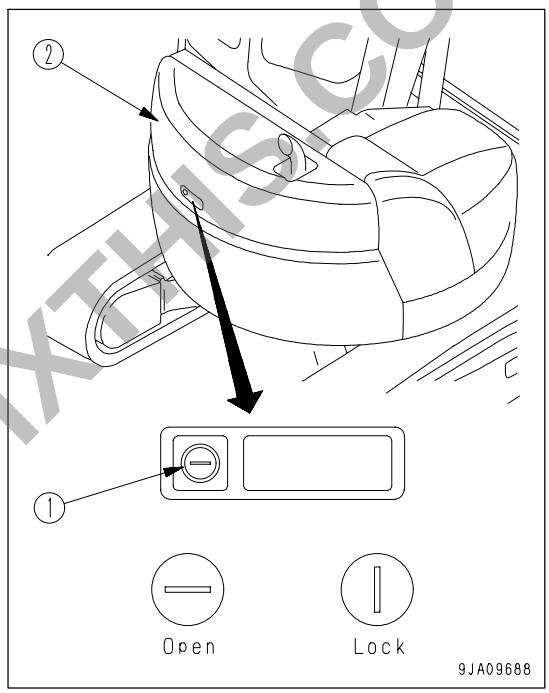
- **Never attempt to climb on the engine hood. There is the danger that you may slip off.**
- **When carrying out inspection and maintenance inside the engine hood, always use the hood support lever to hold the engine hood open.**
- **Always keep the engine hood closed during operation, except when carrying out inspection.**

NOTICE

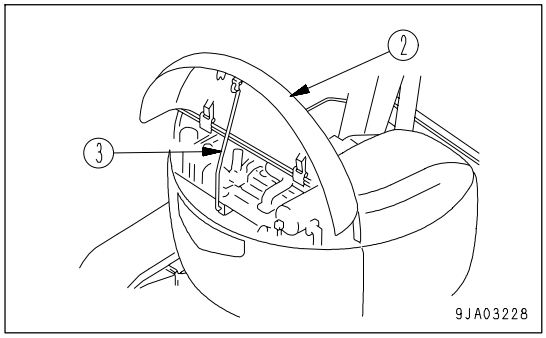
Always keep the hood locked except when opening it.

Check the direction of the key slot in the opening knob to check that it is locked.

1. Release lock (1) of the engine hood.
   (For details see "Opening and Closing Covers with Lock (PAGE 3-83)".)
2. Push engine hood opening knob (1) and open hood (2).



3. After opening the hood, use hood support lever (3) to secure the hood in position.
4. There are two places for securing the hood, so select the place and the amount of opening depending on the location of the inspection.
5. When closing hood (2), remove hood support lever (3), fit it securely in the lever lock, then lower the hood slowly and push it down to lock it.



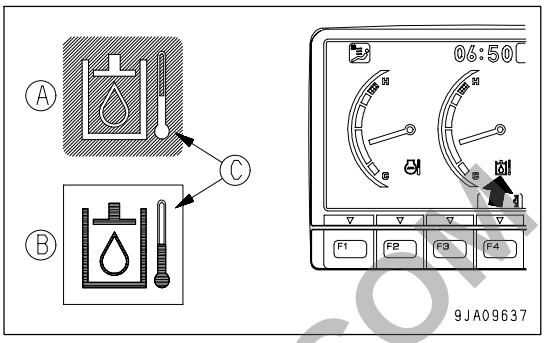
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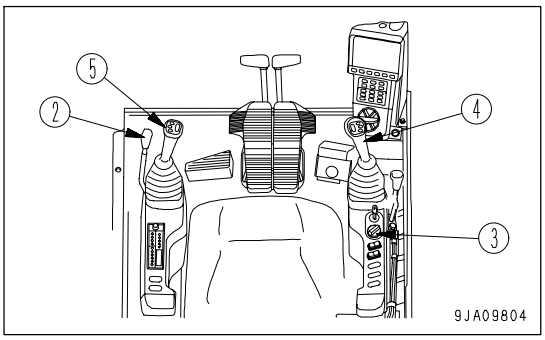
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Hydraulic Equipment Warm Up

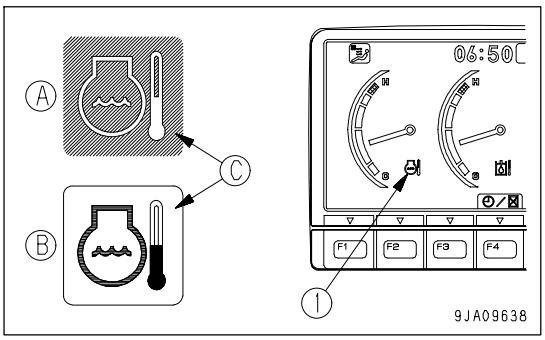
WARNING

- **When warming up the hydraulic equipment, check that there is no person or obstacle in the surrounding area, then sound the horn and start the operation.**
- **Carry out the warming-up operation for the hydraulic equipment until the hydraulic oil temperature monitor displays the correct temperature. (When the hydraulic oil temperature is low, the low temperature display shown in the diagram on the right is given.**
  (A) Display when temperature is correct: Monitor background (C) is blue
  (B) Display when temperature is low: Monitor background (C) is white)
- **The warming-up operation for the hydraulic equipment is necessary not only for the circuit between the pump and cylinders and between the pump and motor, but also for the control circuits. Do not carry out the operation just for one cylinder or motor, or the operation just in one direction. Carry out the operation in all directions for all the work equipment (boom, arm, bucket), swing, travel, and attachment (if equipped).**





1. Check that engine coolant temperature monitor (1) displays the correct temperature.
   (A) Display when temperature is correct: Monitor background (C) is blue
   (B) Display when temperature is low: Monitor background (C) is white
   If it displays low temperature, carry out additional warm up of the engine until engine coolant temperature monitor (1) displays the correct temperature.
   For details of the procedure, see "Engine Warm Up (PAGE 3-130)".

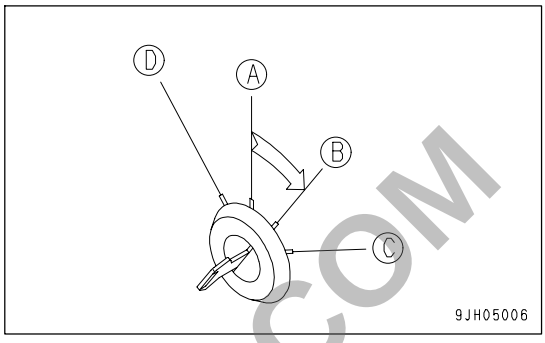


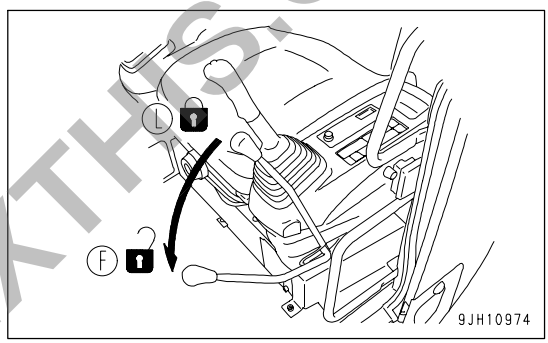
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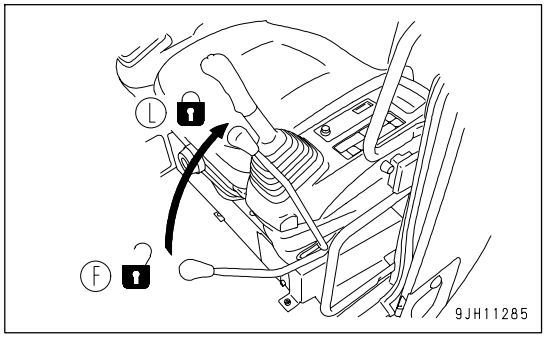
Attachment Removal

1. Lower the attachment to the ground and stop the engine.
2. Turn the starting switch to the ON position (B), then set the lock lever to the FREE position (F).
3. Within 15 seconds after stopping the engine, move each control lever (for work equipment and travel) and attachment control switch to the full stroke in all directions to release the internal pressure.





4. Set the lock lever to the LOCK position (L), then turn the starting switch to the OFF position (A).



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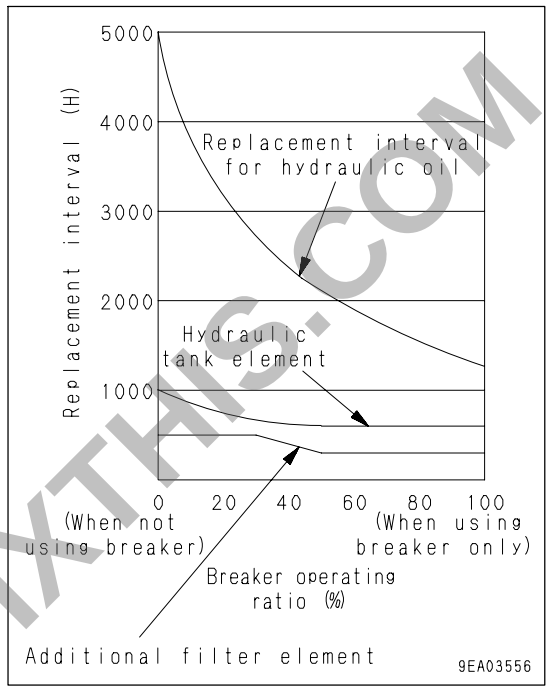
MAINTENANCE INTERVAL FOR HYDRAULIC BREAKER

For machine equipped with a hydraulic breaker, the hydraulic oil deteriorates faster than for normal bucket digging operations, so set the maintenance intervals as follows.

- **Replace hydraulic filter element**
  On a new machine, replace the element after the first 100 to 150 hours, then carry out further replacement of the element according to the table on the right.

- **Change oil in hydraulic tank**
  Change the oil according to the table on the right.

- **Replacing additional filter element for breaker (if equipped)**
  Use a guideline of 250 hours for use of the breaker (operating ratio for the breaker: 50 % or more), and replace the element according to the table on the right.



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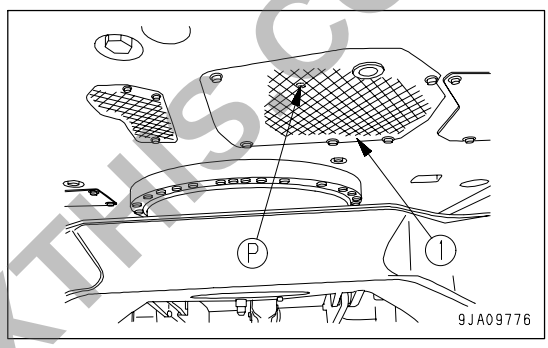
CHANGE OIL IN ENGINE OIL PAN, REPLACE ENGINE OIL FILTER CARTRIDGE

WARNING

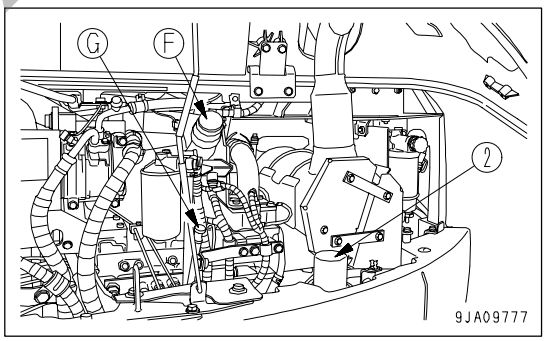
Parts and oil are at high temperature immediately after the engine is stopped and may cause serious burns. Wait for the oil temperature to go down before performing this operation.

- Oil pan refill amount: 11 liters (2.91 US gal)
- Prepare a filter wrench

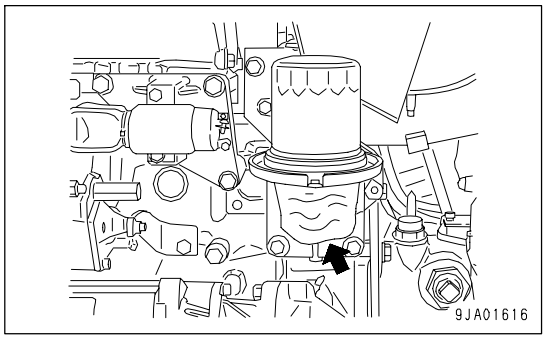
1. Remove undercover (1) at the bottom of the machine, then set the container under drain plug (P) to catch the oil.
2. Loosen drain plug (P) and drain the oil. Be careful not to get oil on yourself.
3. Tighten drain plug (P).



4. Open the engine hood, then use a filter wrench to turn filter cartridge (2) to the left and remove it.



REMARK
Put a cloth in contact with the notched part of the oil container guide. This makes it possible to prevent the area around the filter holder from becoming dirty.



5. Clean the filter holder, then coat the thread and the packing portion of the new filter cartridge with clean engine oil (or coat thinly with grease), and install.

REMARK
Check that there is no old packing stuck to the filter holder. If there is any old packing stuck to the filter, it will cause leakage of oil.

6. When installing, bring the packing surface into contact with the seal surface of the filter holder, then tighten a further 1/2 turns.

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