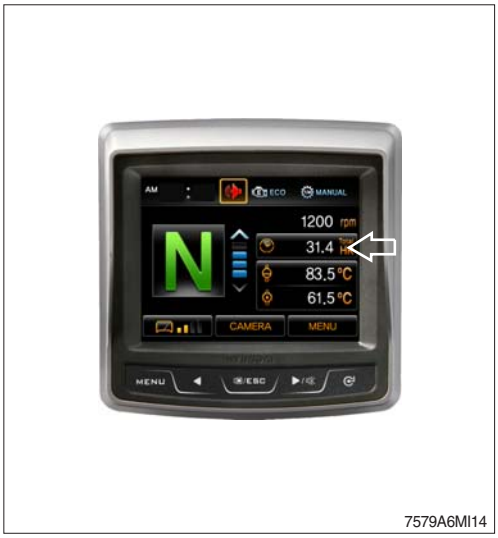
1. INSTRUCTIONS

1) INTERVAL OF MAINTENANCE

(1) You may inspect and service the machine by the period as described at page 6-10 based on service meter of monitor.

(2) Shorten the interval of inspect and service depending on site condition. (Such as dusty area, quarry, sea shore and etc.)

(3) Practice the entire related details at the same time when the service interval is doubled.
For example, in case of 250 hours, carry out all the maintenance 「each 250 hours, each 100 hours and daily service」 at the same time.



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2) PRECAUTION

(1) Start maintenance after you have the full knowledge of machine.

(2) The cluster and monitor installed on this machine do not entirely guarantee the condition of the machine.
Daily inspection should be performed according to chapter 6, Maintenance.

(3) Engine and hydraulic components have been preset in the factory.
Do not allow unauthorized personnel to reset them.

(4) Ask to your local dealer or Hyundai for maintenance advise if unknown.

(5) Drain the used oil and coolant in a container and handle according to the method of handling for industrial waste to meet with regulations of each province or country.

3) PROPER MAINTENANCE

(1) Replace and repair of parts
It is required to replace the wearable and consumable parts such as bucket tooth, cutting edge, filter and etc., regularly.
Replace damaged or worn parts at proper time to keep the performance of machine.

(2) Use genuine parts.

(3) Use the recommended oil.

(4) Remove the dust or water around the inlet of oil tank before supplying oil.

(5) Drain oil when the temperature of oil is warm.

(6) Do not repair anything while operating the engine.
Stop the engine when you fill the oil.

(7) Relieve hydraulic system of the pressure by opening of breather when repairing the hydraulic system.

(8) Confirm if the cluster is in the normal condition after completion of service.

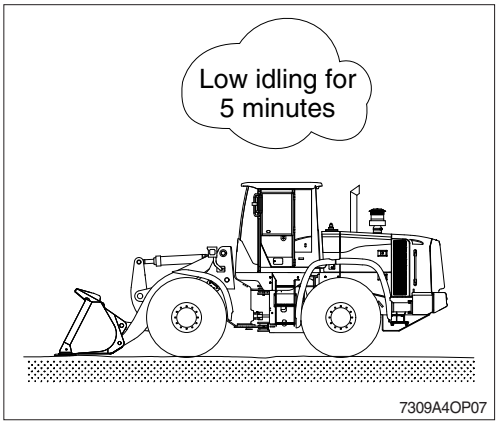
(9) For more detail information of maintenance, please contact local Hyundai dealer.

※ **Be sure to start the maintenance after fully understand the chapter 1, Safety hints.**

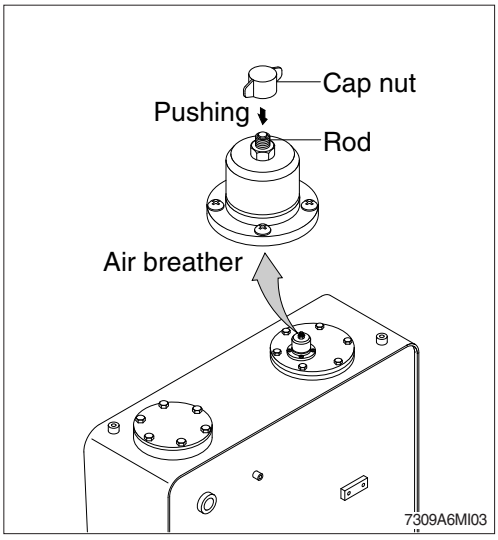
4) RELIEVING THE PRESSURE IN THE HYDRAULIC SYSTEM

※ **Spouting of oil can cause the accident when loosening the cap or hose right after the operating of the machine as the machine or oil is on the high pressure on the condition.**
Be sure to relieve the pressure in the system before repairing hydraulic system.

(1) Place the machine in parking position, and stop the engine.



(2) Rotate the cap nut counter-clockwise by hand and push the rod to release the air pressure.



5) PRECAUTION WHEN INSTALLING HYDRAULIC HOSES OR PIPES

(1) Be particularly careful that the joint of hose, pipe and functioning item are not damaged. Avoid contamination.

(2) Assemble after cleaning the hose, pipe and joint of functioning item.

(3) Use genuine parts.

(4) Do not assemble the hose in the condition of twisted or sharp radius.

(5) Keep the specified tighten torque.

6) PERIODICAL REPLACEMENT OF SAFETY PARTS

(1) These are the parts which the operator can not judge the remained lifetime of them by visual inspection.

(2) Repair or replace if an abnormality of these parts is found even before the recommended replacement interval.

Periodical replacement of safety parts	Interval
Fuel hose (engine-tank)	Every 2 years
Hose of steering system	
Packing, seal and O-ring of steering cylinder	
Hose of brake system	
Piston seal and packing of boom, bucket cylinder	

※ 1. **Replace the O-ring and gasket at the same time when replace the hose.**

※ 2. **Replace clamp at the same time if the hose clamp is cracked when checking and replacing the hose.**

2. TIGHTENING TORQUE

Use following table for unspecified torque.

1) BOLT AND NUT

(1) Coarse thread

Bolt size	8T		10T	
	kg · m	lb · ft	kg · m	lb · ft
M 6 × 1.0	0.85 ~ 1.25	6.15 ~ 9.04	1.14 ~ 1.74	8.2 ~ 12.6
M 8 × 1.25	2.0 ~ 3.0	14.5 ~ 21.7	2.73 ~ 4.12	19.5 ~ 29.8
M10 × 1.5	4.0 ~ 6.0	28.9 ~ 43.4	5.5 ~ 8.3	39.8 ~ 60
M12 × 1.75	7.4 ~ 11.2	53.5 ~ 79.5	9.8 ~ 15.8	71 ~ 114
M14 × 2.0	12.2 ~ 16.6	88.2 ~ 120	16.7 ~ 22.5	121 ~ 167
M16 × 2.0	18.6 ~ 25.2	135 ~ 182	25.2 ~ 34.2	182 ~ 247
M18 × 2.5	25.8 ~ 35.0	187 ~ 253	35.1 ~ 47.5	254 ~ 343
M20 × 2.5	36.2 ~ 49.0	262 ~ 354	49.2 ~ 66.6	356 ~ 482
M22 × 2.5	48.3 ~ 63.3	350 ~ 457	65.8 ~ 98.0	476 ~ 709
M24 × 3.0	62.5 ~ 84.5	452 ~ 611	85.0 ~ 115	615 ~ 832
M30 × 3.0	124 ~ 168	898 ~ 1214	169 ~ 229	1223 ~ 1655
M36 × 4.0	174 ~ 236	1261 ~ 1703	250 ~ 310	1808 ~ 2242

(2) Fine thread

Bolt size	8T		10T	
	kg · m	lb · ft	kg · m	lb · ft
M 8 × 1.0	2.17 ~ 3.37	15.7 ~ 24.3	3.04 ~ 4.44	22.0 ~ 32.0
M10 × 1.25	4.46 ~ 6.66	32.3 ~ 48.2	5.93 ~ 8.93	42.9 ~ 64.6
M12 × 1.25	7.78 ~ 11.58	76.3 ~ 83.7	10.6 ~ 16.0	76.6 ~ 115
M14 × 1.5	13.3 ~ 18.1	96.2 ~ 130	17.9 ~ 24.1	130 ~ 174
M16 × 1.5	19.9 ~ 26.9	144 ~ 194	26.6 ~ 36.0	193 ~ 260
M18 × 1.5	28.6 ~ 43.6	207 ~ 315	38.4 ~ 52.0	278 ~ 376
M20 × 1.5	40.0 ~ 54.0	289 ~ 390	53.4 ~ 72.2	386 ~ 522
M22 × 1.5	52.7 ~ 71.3	381 ~ 515	70.7 ~ 95.7	512 ~ 692
M24 × 2.0	67.9 ~ 91.9	491 ~ 664	90.9 ~ 123	658 ~ 890
M30 × 2.0	137 ~ 185	990 ~ 1338	182 ~ 248	1314 ~ 1795
M36 × 3.0	192 ~ 260	1389 ~ 1879	262 ~ 354	1893 ~ 2561

2) PIPE AND HOSE (FLARE type)

Thread size	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130
1"	41	21	152
1-1/4"	50	35	253

3) PIPE AND HOSE (ORFS type)

Thread size	Width across flat (mm)	kgf · m	lbf · ft
9/16-18	19	4	28.9
11/16-16	22	5	36.2
13/16-16	27	9.5	68.7
1-3/16-12	36	18	130
1-7/16-12	41	21	152
1-11/16-12	50	35	253

4) FITTING

Thread size	Width across flat (mm)	kgf · m	lbf · ft
1/4"	19	4	28.9
3/8"	22	5	36.2
1/2"	27	9.5	68.7
3/4"	36	18	130
1"	41	21	152
1-1/4"	50	35	253

5) TIGHTENING TORQUE OF MAJOR COMPONENT

No.	Descriptions		Bolt size	Torque	
				kgf · m	lbf · ft
1	Engine	Engine mounting bolt, nut (rubber, 2EA)	M16×2.0	29.7 ± 4.5	215 ± 32.5
2		Engine mounting bolt (bracket, 6EA)	M12×1.75	10.7 ± 1.6	77.4 ± 11.6
3		Radiator mounting bolt (6EA)	M16×2.0	29.7 ± 4.5	215 ± 32.5
4		Fuel tank mounting bolt, nut	M16×2.0	29.7 ± 4.5	215 ± 32.5
5		Air cleaner mounting bolt	M16×1.0	3.95	28.6
6		Air cleaner bracket maunting bolt	M12×1.75	10.7 ± 1.6	77.4 ± 11.6
7		DOC mounting U-bolt, nut	M10×1.5	6.9 ± 1.4	50 ± 10.1
8	Hydraulic system	Main pump housing mounting bolt	M12×1.75	12.8 ± 3.0	92.6 ± 21.7
9		Fan & brake pump housing mounting bolt	M10×1.5	6.9 ± 1.4	50 ± 10.1
10		Main control valve mounting bolt	M10×1.5	6.9 ± 1.4	50 ± 10.1
11		Steering unit mounting bolt	M10×1.5	6.9 ± 1.4	50 ± 10.1
12		Cushion valve mounting bolt	M8×1.25	2.5 ± 0.5	18.1 ± 3.6
13		Brake valve mounting bolt	M10×1.5	6.9 ± 1.4	50 ± 10.1
14		Cut-off valve mounting bolt	M12×1.75	12.8 ± 3.0	92.6 ± 21.7
15		Remote control lever mounting bolt	M6×1.0	1.1 ± 0.2	8.0 ± 1.4
16		Safety valve mounting bolt	M10×1.5	6.9 ± 1.4	50 ± 10.1
17		Hydraulic oil tank mounting bolt	M16×2.0	29.7 ± 4.5	215 ± 32.5
18	Power train system	Transmission mounting bolt, nut (rubber, 2EA)	M20×2.5	57.9 ± 8.7	419 ± 63
19		Transmission mounting bolt (bracket, 6EA)	M16×2.0	18.4 ± 2.0	133 ± 14.5
20		Front axle mounting bolt, nut	M27×2.0	135 ± 15	976 ± 108
21		Rear axle support mounting bolt, nut	M24×2.0	135 ± 15	976 ± 108
22		Tire mounting nut	M22×1.5	77.4 ± 11.6	560 ± 83.9
23		Drive shaft joint mounting bolt, nut	3/8-24UNF	6.0 ± 0.8	43.4 ± 5.8
24	Others	Counterweight mounting bolt	M30×3.5	199 ± 30	1439 ± 216
25		Operator's seat mounting bolt	M8×1.25	3.4 ± 0.7	24.6 ± 5.1
26		ROPS Cab mounting bolt (4EA)	M20×2.5	58 ± 8.7	419 ± 63
27		ROPS Cab mounting nut (4EA)	M16×2.0	29.7 ± 4.5	215 ± 32.5

3. SPECIFICATION OF FUEL, COOLANT AND LUBRICANTS

1) NEW MACHINE

New machine used and filled with following lubricants.

Description	Specification
Engine oil	SAE 15W-40 (API CJ-4)
Hydraulic oil	Hyundai genuine long life hydraulic oil (ISO VG46, VG68 only) Conventional hydraulic oil (ISO VG 15, ★2cold region)
Transmission oil	SAE 15W-40
Axle oil	★Refer to below list
Grease	Lithium base grease NLGI No. 2
Fuel	ASTM D975-No. 2, ★1Ultra low sulfur diesel
Coolant	Mixture of 50% ethylene glycol base antifreeze and 50% water

SAE : Society of Automotive Engineers
API : American Petroleum Institute
ISO : International Organization for Standardization
NLGI : National Lubricating Grease Institute
ASTM : American Society of Testing and Material

★ Recommended oil list
- **BP TERRAC SUPER TRANSMISSION 10W-30**
- **CASTROL AGRI TRANS PLUS 10W-30**
- **MOBILFLUID 426**
- **SHELL DONAX TD 10W-30**
- **TOTAL DYNATRANS MPV**

★1 Ultra low sulfur diesel
- sulfur content ≤ 15 ppm

★2 Cold region
- Russia, CIS, Mongolia

2) RECOMMENDED OILS

Use only oils listed below or equivalent.

Do not mix different brand oil.

Service point	Kind of fluid	Capacity ℓ (U.S. gal)	Ambient temperature °C(°F) -50 (-58) -30 (-22) -20 (-4) -10 (14) 0 (32) 10 (50) 20 (68) 30 (86) 40 (104)
Engine oil pan	Engine oil	11 (2.9)	★2 SAE 5W-40 SAE 30 SAE 10W SAE 10W-30 SAE 15W-40
Transmission	Engine oil	20 (5.3)	SAE 10W-30 SAE 15W-40
Axle	UTTO	FR : 17 (4.5) RR : 17 (4.5)	★Refer to below list
Hydraulic tank	Hydraulic oil	Tank; 121 (32.0) System; 154 (40.7)	★2 ISO VG 15 ISO VG 46 ISO VG 68
Fuel tank	Diesel fuel★1	200 (52.8)	★2 ASTM D975 NO.1 ASTM D975 NO.2
Fitting (grease nipple)	Grease	As required	★2 NLGI NO.1 NLGI NO.2
Radiator (reservoir tank)	Mixture of antifreeze and soft water★3	30 (7.9)	Ethylene glycol base permanent type (50 : 50) ★2 Ethylene glycol base permanent type (60 : 40)

SAE : Society of Automotive Engineers

API : American Petroleum Institute

ISO : International Organization for Standardization

NLGI : National Lubricating Grease Institute

ASTM : American Society of Testing and Material

UTTO : Universal Tractor Transmission Oil

★1 Ultra low sulfur diesel

- sulfur content ≤ 15 ppm

★2 Cold region

Russia, CIS, Mongolia

★ Recommended oil list

- **BP TERRAC SUPER TRANSMISSION 10W-30**
- **CASTROL AGRI TRANS PLUS 10W-30**
- **MOBILFLUID 426**
- **SHELL DONAX TD 10W-30**
- **TOTAL DYNATRANS MPV**

★3 Soft water

City water or distilled water

4. MAINTENANCE CHECK LIST

Scheduled maintenance is the normal maintenance necessary to provide proper and efficient machine operation. To protect your investment and prolong the service life of your machine, follow the scheduled maintenance list below.

1) EVERY 10 HOURS SERVICE

Check items	Service	Page
Hydraulic oil level	Check, Add	6-29
Engine oil level	Check, Add	6-15
Radiator coolant level	Check, Add	6-17
Belt tension & damage	Check	6-22, 23
Fuel pre-filter element	Clean	6-25

2) EVERY 50 HOURS SERVICE

Check items	Service	Page
Attachment pins	Lubricate	6-43
Tire (air)	Check, Add	6-32
Drive shaft (flange bearing, front, center, rear, upper)	Lubricate	6-40
Steering cylinder pins	Lubricate	6-40
Rear axle pivot	Lubricate	6-40

3) INITIAL 200 HOURS SERVICE

Check items	Service	Page
Brake pressure filter element (-#0041)	Replace	6-31

4) INITIAL 250 HOURS SERVICE

Check items	Service	Page
Engine oil	Change	6-15, 16, 17
Engine oil filter element	Replace	6-15, 16, 17
Fuel filter element	Replace	6-26
Fuel pre-filter element	Replace	6-26
Transmission oil	Change	6-35, 36
Transmission oil filter	Replace	6-35, 36
Axle oil (front and rear)	Change	6-38, 39
Hydraulic oil return filter	Replace	6-30
Pilot line filter element	Replace	6-31

5) EVERY 250 HOURS SERVICE

Check items	Service	Page
Wheel nuts	Check, Tight	6-33, 34
Fuel tank (water, sediment)	Drain	6-25
Battery (voltage)	Check	6-45, 46
Hydraulic tank air breather element	Replace	6-30
Air conditioner and heater inner, outer filter	Check, Clean	6-48
Brake line filter (strainer) : #0042-	Check, Clean	6-31

6) EVERY 500 HOURS SERVICE

Check items	Service	Page
★Engine oil	Change	6-15, 16, 17
★Engine oil filter	Replace	6-15, 16, 17
Fuel filter element	Replace	6-26
Fuel pre-filter element	Replace	6-26
Radiator, oil cooler, charge air cooler	Check, Clean	6-21

★ **If you use high sulfur containing fuel above than 0.5% or use low grade of engine oil reduce change interval.**

7) EVERY 1000 HOURS SERVICE

Check items	Service	Page
Brake pressure filter element (-#0041)	Replace	6-31
Hydraulic oil return filter	Replace	6-30
Pilot line filter element	Replace	6-31
Center pivot pin	Lubricate	6-40
Transmission oil	Change	6-35, 36
Transmission oil filter	Replace	6-35, 36
Aircon and heater outer filter	Replace	6-48
Air cleaner element (primary)	Clean	6-24

8) EVERY 1500 HOURS SERVICE

Check items	Service	Page
Axle oil (front and rear)	Change	6-38, 39

10) EVERY 1500 HOURS SERVICE

Check items	Service	Page
Axle oil (front and rear)	Change	6-38, 39

11) EVERY 2000 HOURS SERVICE

Check items	Service	Page
Hydraulic oil *1	Change	6-29
Radiator coolant	Change	6-17, 18, 19, 20
Hydraulic oil suction strainer	Check, Clean	6-30
Crankcase ventilation filter	Replace	6-27
Hoses, fittings, clamps (fuel, coolant, hydraulic)	Check, Retighten, Replace	-

*1 Conventional hydraulic oil

12) EVERY 5000 HOURS SERVICE

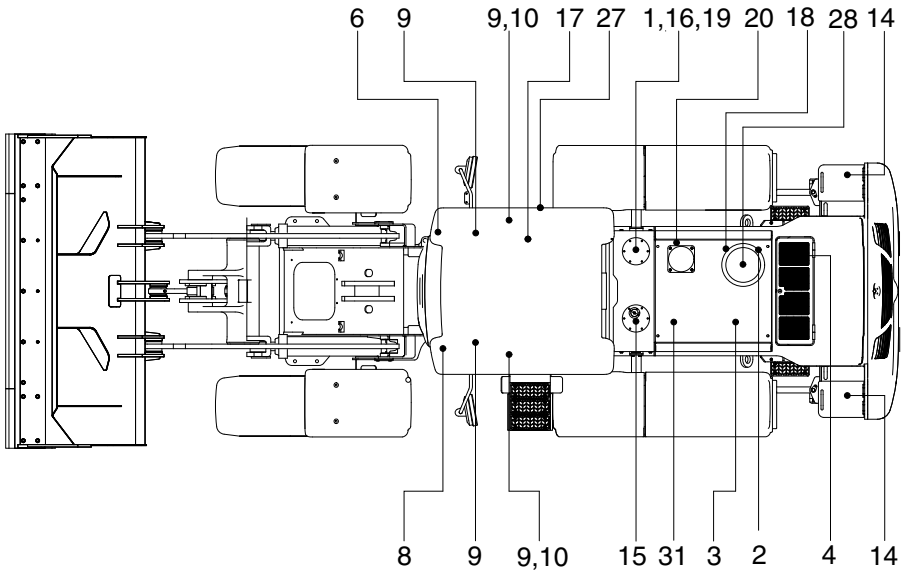
Check items	Service	Page
Hydraulic oil *2	Change	6-29

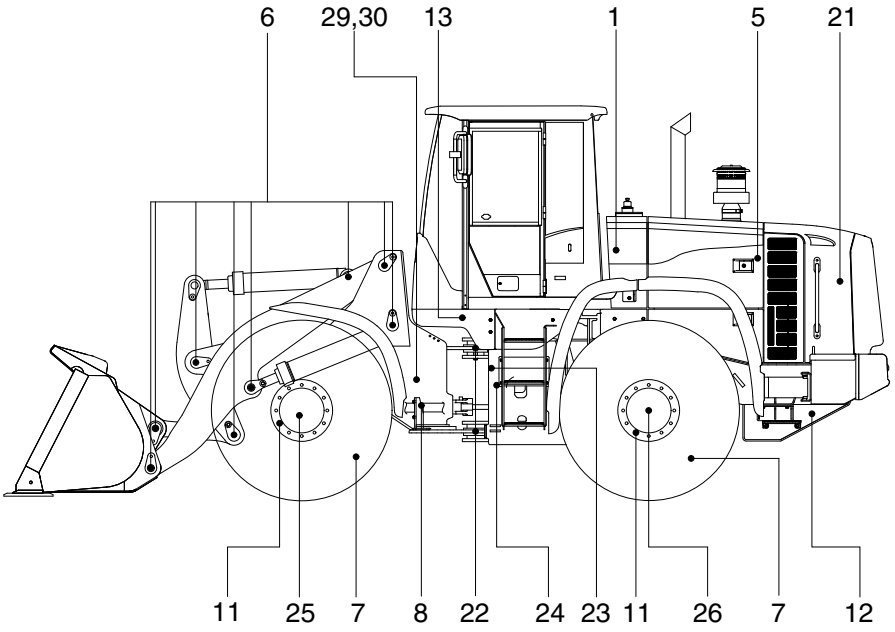
*2 Hyundai genuine long life hydraulic oil

13) WHEN REQUIRED

Check items	Service	Page
Air cleaner element		
· Safety	Replace	6-24
· Primary	Clean, Replace	6-24
Air conditioner and heater		
· Outer filter	Clean, Replace	6-48
· Inner filter	Clean, Replace	6-48

5. MAINTENANCE CHART





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Caution

1. Service intervals are based on the hour meter reading.
2. The number of each item shows the lubrication point on the machine.
3. Stop engine while filling oil, and use no open flames.
4. For other details, refer to the service manual.

Service interval	No.	Description	Service action	Oil symbol	Capacity ℓ(U.S.gal)	Service points No.
10 Hours or daily	1	Hydraulic oil level	Check, Add	HO	121 (32)	1
	2	Engine oil level	Check, Add	EO	11 (2.9)	1
	4	Radiator coolant level	Check, Add	C	30 (7.9)	1
	5	Fan belt tension & damage	Check, Adjust	-	-	2
	20	Fuel pre-filter element	Clean	-	-	1
50 Hours or weekly	6	Attachment pins	Lubricate	PGL	-	13
	7	Tire (air)	Check, Add	-	-	4
	8	Drive shaft (flange bearing)	Lubricate	PGL	-	1
	9	Steering cylinder pin	Lubricate	PGL	-	4
	10	Rear axle pivot	Lubricate	PGL	-	2
	29,30	Drive shaft sleeve yoke, journal bearing	Lubricate	PGL	-	9
250 Hours	11	Wheel nuts	Check, Tight	-	-	40
	12	Fuel tank (water, sediment)	Drain	-	-	1
	13	Brake line filter (strainer) : #0042-	Check, Clean	-	-	1
	14	Battery (voltage)	Check, Add	-	-	1
	16	Hydraulic tank air breather element	Replace	-	-	1
	27	Air conditioner and heater inner, outer filter	Check, Clean	-	-	2
500 Hours	2	Engine oil	Change	EO	11 (2.9)	1
	3	Engine oil filter	Replace	-	-	1
	18	Fuel filter element	Replace	-	-	1
	20	Fuel pre-filter element	Replace	-	-	1
	21	Radiator, oil cooler, charge air cooler	Clean	-	-	3
1000 Hours	13	Brake pressure filter element (-#0041)	Replace	-	-	1
	15	Hydraulic oil return filter	Replace	-	-	1
	17	Pilot line filter element	Replace	-	-	1
	22	Center pivot pin	Lubricate	PGL	-	2
	23	Transmission oil	Change	EO	20 (5.3)	1
	24	Transmission oil filter	Replace	-	-	1
	27	Air conditioner and heater outer filter	Replace	-	-	1
	28	Air cleaner element (primary)	Clean	-	-	1
1500 Hours	25	Axle oil (front)	Change	UTTO	17 (4.5)	3
	26	Axle oil (rear)	Change	UTTO	17 (4.5)	3
2000 Hours	1	Hydraulic oil *1	Change	HO	121 (32)	1
	4	Radiator coolant	Change	C	30 (7.9)	1
	19	Hydraulic oil suction strainer	Check, Clean	-	-	1
	31	Crankcase ventilation filter	Replace	-	-	1
	-	Hoses, fittings, clamps (fuel, coolant, hydraulic)	Check, Retighten, Replace	-	-	-
5000 Hours	1	Hydraulic oil *2	Change	HO	121 (32)	1
When required	27	Air conditioner and heater outer filter	Replace	-	-	1
		Air conditioner and heater inner filter	Clean, Replace	-	-	1
	28	Air cleaner element (safety)	Replace	-	-	1
		Air cleaner element (primary)	Clean, Replace	-	-	1

*1 Conventional hydraulic oil *2 Hyundai genuine long life hydraulic oil

※ **Oil symbol** : Refer the recommended lubricants for specification.

·EO : Engine oil ·PGL : Grease ·GO : Gear oil

·HO : Hydraulic oil ·C : Coolant ·UTTO : Refer to page 6-9.

1) CHECK ENGINE OIL LEVEL

Check the oil level with the machine on a flat ground before starting engine.

(1) Pull out the dipstick and wipe with a clean cloth.

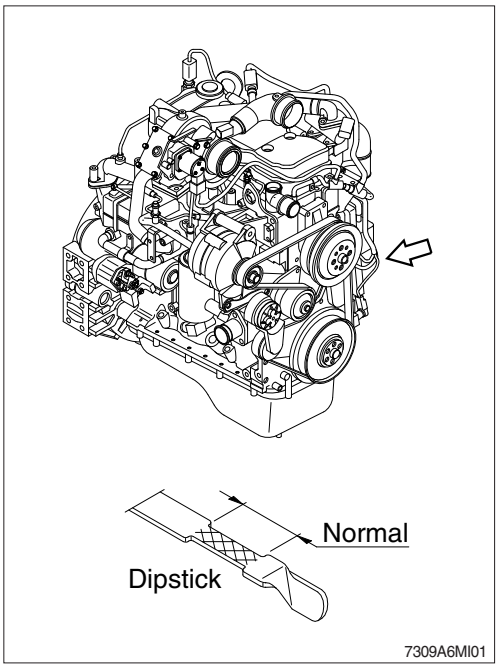
(2) Check the oil level by inserting the dipstick completely into the hole and pulling out again.

(3) If oil level is LOW, add oil and then check again.

※ If the oil is contaminated or diluted, change the oil regardless of the regular change interval.

※ Check oil level after engine has been stopped for 15 minutes.

⚠ Do not operate unless the oil level is in the normal range.



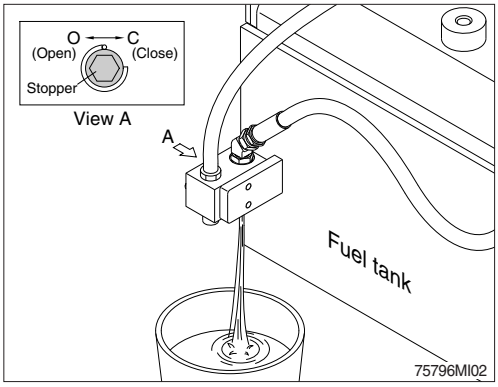
2) REPLACEMENT OF ENGINE OIL AND OIL FILTER

(1) Operate the engine until the coolant temperature reaches 60˚C (140˚F). Shut off the engine.

(2) Turn the stopper to the open position and allow the oil to drain.

· Wrench size : 10 mm

※ A drain pan with a capacity of 20 liters (5.3 U.S.gallons) will be adequate.

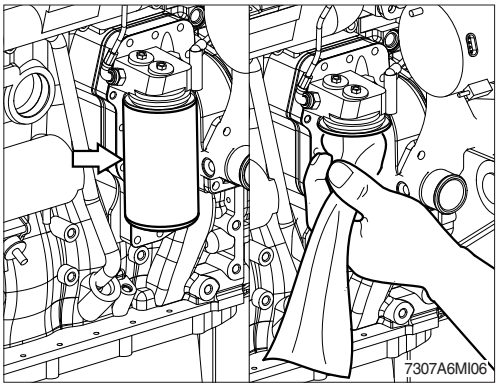


(3) Clean the area around the oil filter head.

(4) Use oil filter wrench to remove the oil filter.

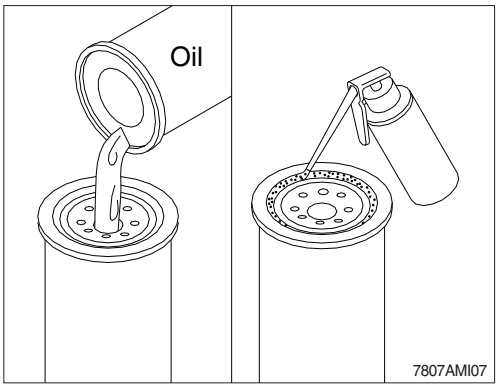
(5) Clean the gasket surface of oil filter head.

※ The O-ring can stick on the filter head; make sure it is removed.



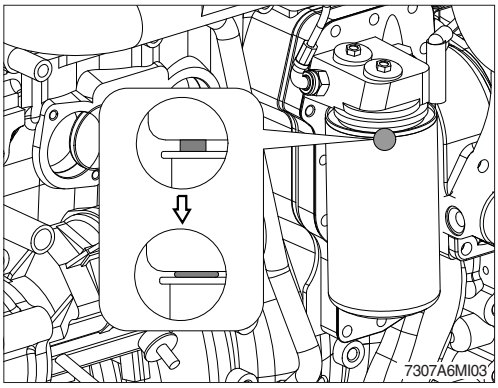
(6) Apply a light film of lubricating oil to the gasket sealing surface before installing the filter.

※ **Fill the filter with clean lubricating oil.**

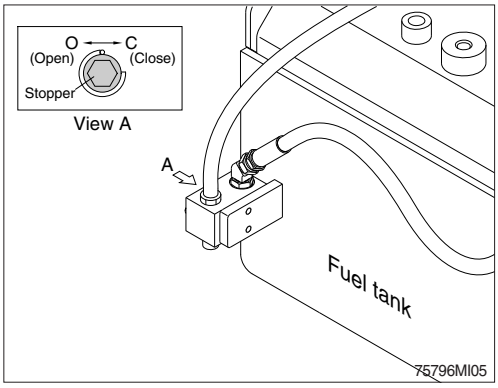


(7) Install the filler to the filter head.
Tighten the filter until the gasket contacts the filter head surface.
Tighten 3/4 to 1 turn after gasket makes contact with the filter head.

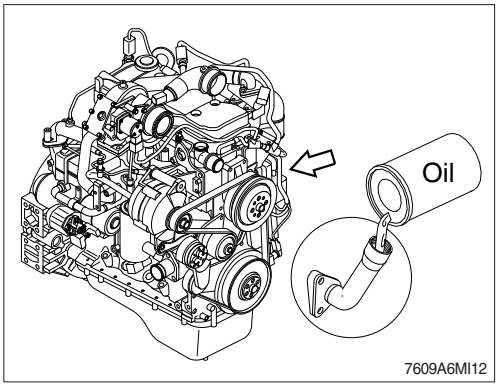
※ **Mechanical over-tightening may distort the threads or damage the filter element seal.**



(8) Turn the stopper to the close position.

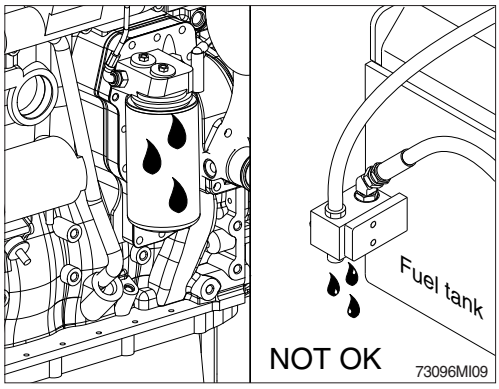


(9) Fill the engine with clean oil to the proper level.
· Quantity : 11 ℓ (2.9 U.S.gallons)



(10) Operate the engine at low idle and inspect for leaks at the filter and the drain plug.
Shut the engine off and check oil level with dipstick. Allow 15 minutes for oil to drain down before checking.

※ **Do not overfill the engine with oil.**



3) CHECK COOLANT LEVEL

(1) Check the engine fault code on the monitor.

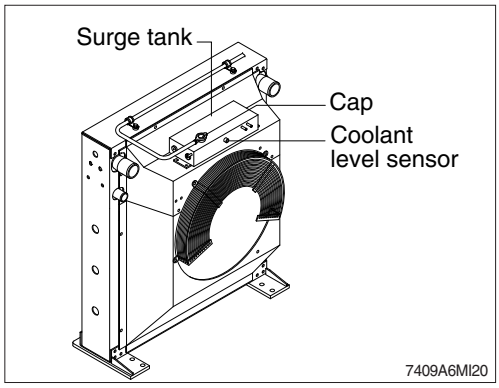
(2) If you following fault codes exist, check the coolant level.
- SPN : 111, FMI : 18
  Coolant level is low.
- SPN : 111, FMI : 1
  Coolant level is the most severely low.

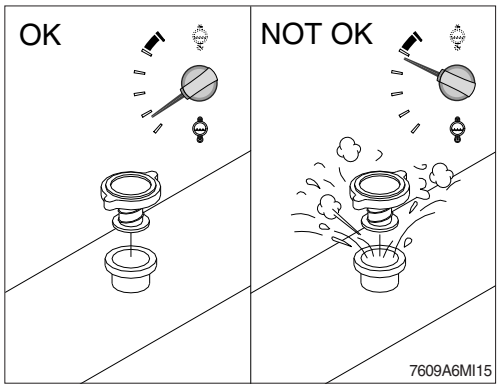
(3) Add the mixture of antifreeze and water after removing the cap of the surge tank if coolant is not sufficient.

(4) Replace gasket of surge tank cap when it is damaged.

⚠ **Do not remove the surge tank cap from a hot engine. Wait until the coolant temperature is below 50˚C (120˚F) before removing the cap. Heated coolant spray or steam can cause personal injury.**

※ **Do not add cold coolant to a hot engine ; engine castings can be damaged. Allow the engine to cool to below 50˚C (120˚F) before adding coolant.**



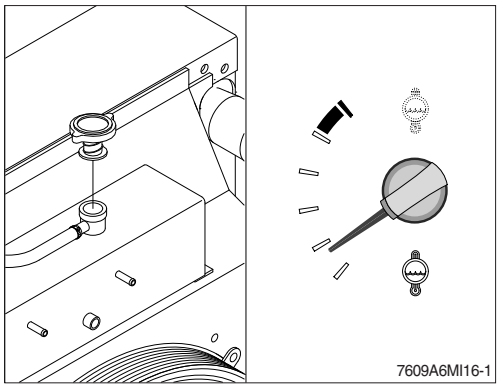


4) FLUSHING AND REFILLING OF RADIATOR

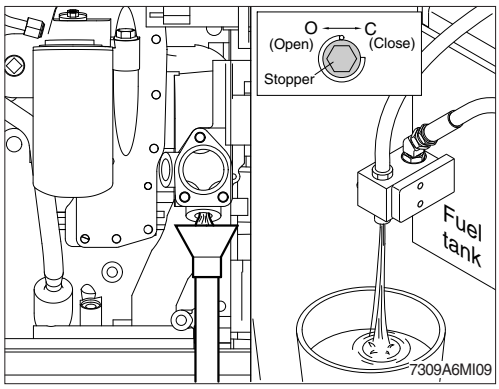
(1) Change coolant

⚠ Avoid prolonged and repeated skin contact with used antifreeze. Such prolonged repeated contact can cause skin disorders or other bodily injury.
Avoid excessive contact-wash thoroughly after contact.
Keep out of reach of children.

⚠ Protect the environment : Handling and disposal of used antifreeze can be subject to federal, state, and local law regulation.
Use authorized waste disposal facilities, including civic amenity sites and garages providing authorized facilities for the receipt of used antifreeze.
If in doubt, contact your local authorities for guidance as to proper handing of used antifreeze.



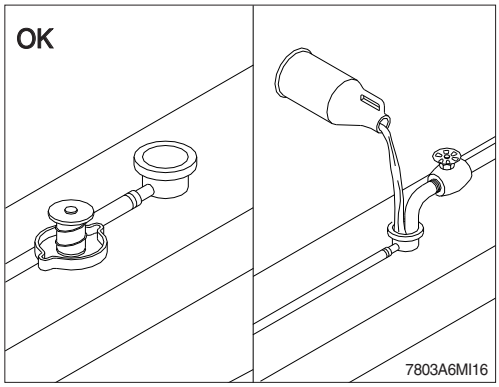
⚠ Wait until the temperature is below 50˚C (120˚F) before removing the coolant system cap. Failure to do so can cause personal injury from heated coolant spray.
Drain the cooling system by turning the stopper to the open position.
A drain pan with a capacity of 45 liters (11.9 U. S.gallons) will be adequate in most applications.



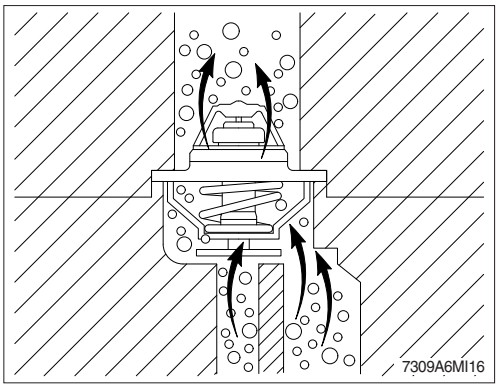
(2) Flushing of cooling system

① Fill the system with a mixture of sodium carbonate and water (or a commercially available equivalent).

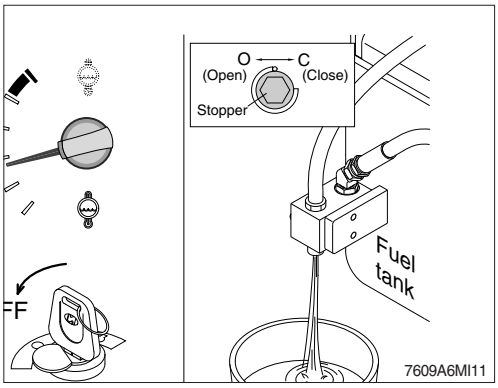
※ Use 0.5 kg (1.0 pound) of sodium carbonate for every 23 liters (6.0 U.S. gallons) of water.
※ Do not install the cap. The engine is to be operated without the cap for this process.



※ **During filling, air must be vented from the engine coolant passages.**
The system must be filled slowly to prevent air locks. Wait 2 to 3 minutes to allow air to be vented, then add mixture to bring the level to the top.



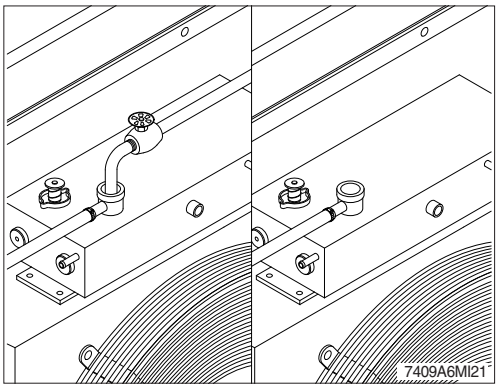
② Operate the engine for 5 minutes with the coolant temperature above 80˚C (176˚F).
Shut the engine off, and drain the cooling system.



③ Fill the cooling system with clean water.

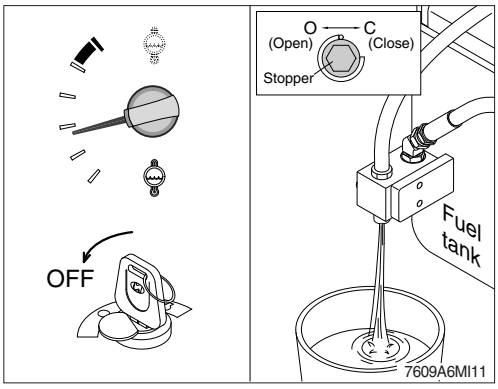
※ **Be sure to vent the engine and EGR cooler for complete system filling.**

※ **Do not install the surge tank cap or the new coolant filter.**



④ Operate the engine for 5 minutes with the coolant temperature above 80˚C (176˚F).
Shut the engine off, and drain the cooling system.

※ **If the water being drained is still dirty, the system must be flushed again until the water is clean.**

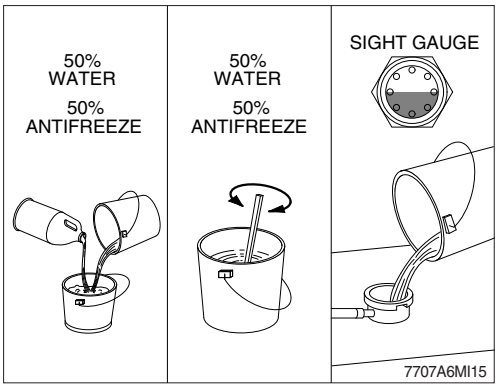


(3) Cooling system filling

① Use a mixture of 50 percent soft water and 50 percent ethylene glycol antifreeze to fill the cooling system. Refer to the page 6-9.

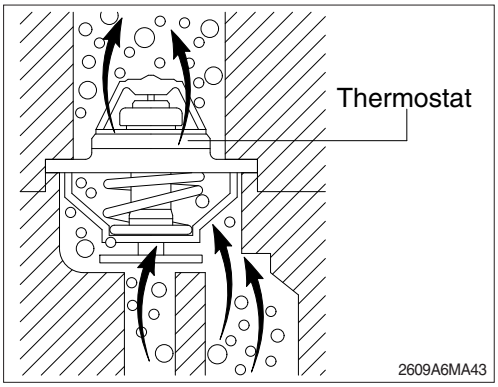
※ **Never use water alone for coolant.**
This can result in damage from corrosion.

※ **Do not use hard water such as river water or well water.**

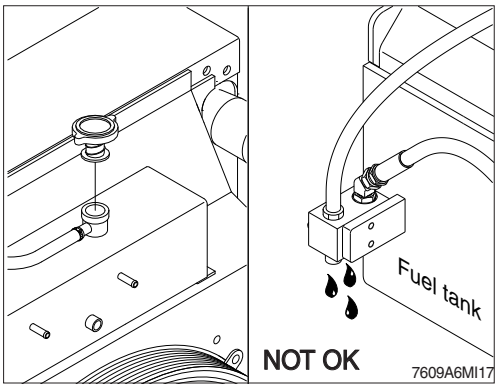


② The system has a maximum fill rate of 19 liters (5.0 U.S. gallons) per minute.
Do not exceed this fill rate.

※ **The system must be filled slowly to prevent air locks.**
During filling, air must be vented from the engine coolant passage.



③ Install the cap. Operate the engine until it reaches a temperature 80˚C (176˚F), and check for coolant leaks.
Check the coolant level again to make sure the system is full of coolant.

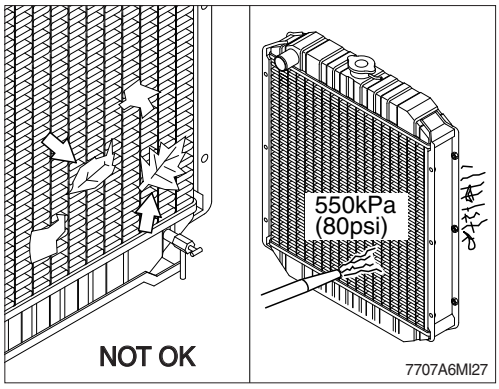


5) CLEAN RADIATOR AND OIL COOLER

Check, and if necessary, clean and dry outside of radiator and oil cooler. After working in a dusty place, clean radiator more frequently.

(1) Visually inspect the radiator for clogged radiator fins.

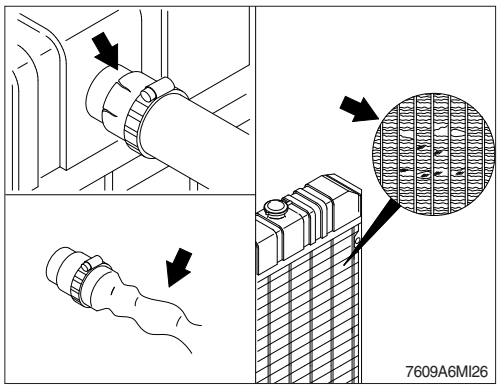
(2) Use 550 kPa (80 psi) air pressure to blow the dirt and debris from the fins.
Blow the air in the opposite direction of the fan air flow.



(3) Visually inspect the radiator for bent or broken fins.

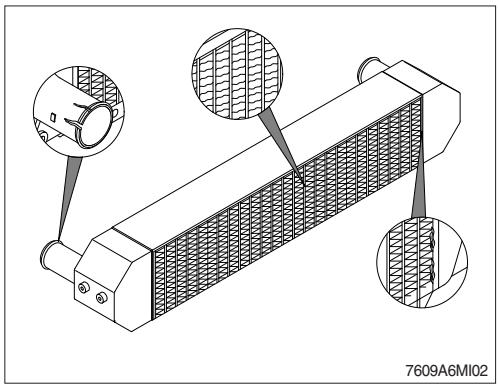
※ **If the radiator must be replaced due to bent or broken fins which can cause the engine to overheat, refer to the manufacturer's replacement procedures.**

(4) Visually inspect the radiator for core and gasket leaks.



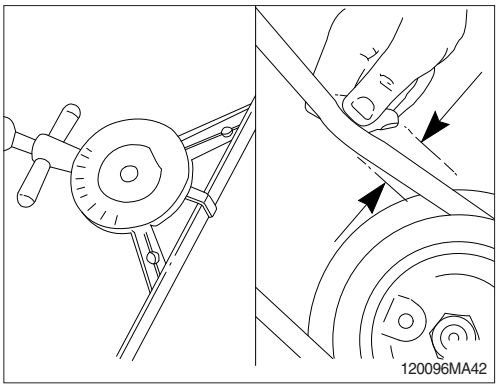
6) CHECK CHARGE AIR COOLER

(1) Inspect the charge air cooler for dirt and debris blocking the fins. Check for cracks, holes, or other damage. If damage is found, please contact hyundai distributor.

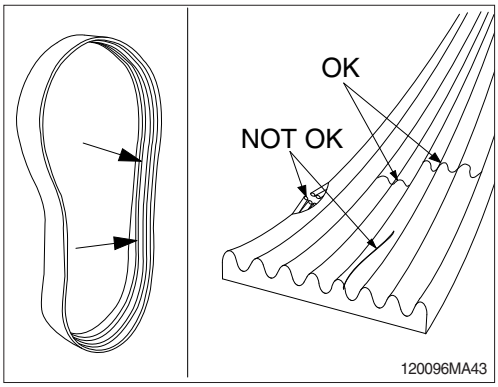


7) FAN BELT TENSION

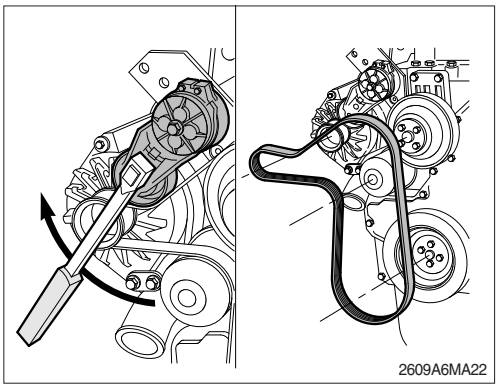
(1) Use the belt tension gage to measure the belt tension.
· Fan belt tension : 11.3 kg (25 lb)



(2) Inspect the drive belt for damage.
① Transverse (across the belt) cracks are acceptable.
② Longitudinal (direction of belt rids) cracks that intersect with transverse cracks are not acceptable.



(3) Inspect the idle and drive pulleys for wear or cracks.

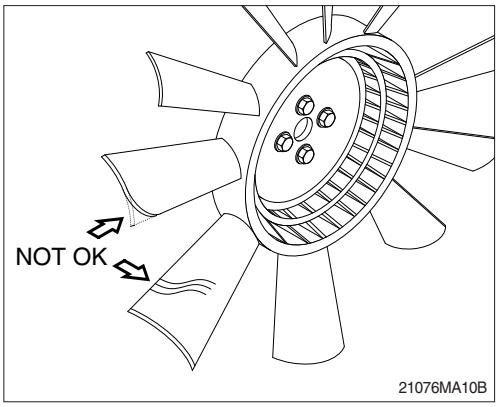


8) INSPECTION OF COOLING FAN

⚠ Personal injury can result from a fan blade failure. Never pull or pry on the fan. This can damage the fan blade and cause fan failure.

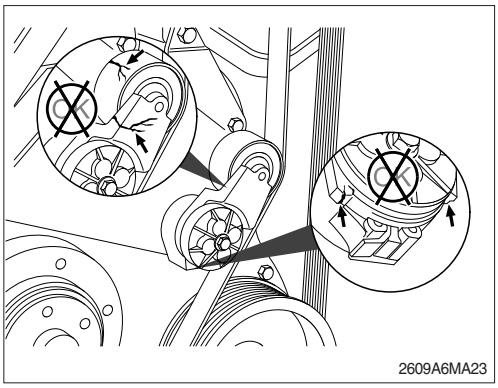
※ Rotate the crankshaft by using the engine barring gear.

※ A visual inspection of the cooling fan is required daily.
Check for cracks, loose rivets, and bent or loose blades.
Check the fan to make sure it is securely mounted. Tighten the capscrews if necessary.
Replace any fan that is damaged.

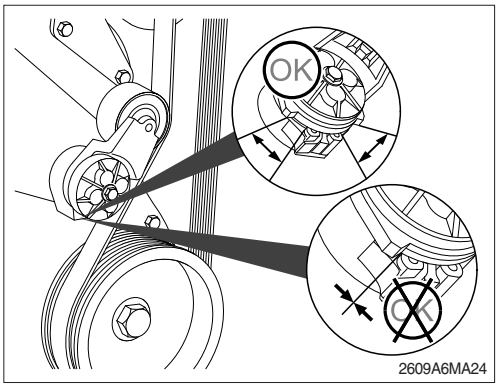


9) FAN BELT TENSION

(1) With the engine stopped, check the tensioner arm, pulley, and stops for cracks. If any cracks are found, the tensioner must be replaced.

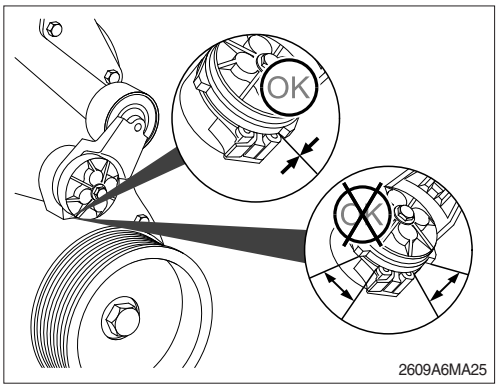


(2) With the belt installed, verify that neither tensioner arm stop is in contact with the spring case stop.
After replacing the belt, if the tensioner arm stops are still in contact with the spring case stop, replace the tensioner.

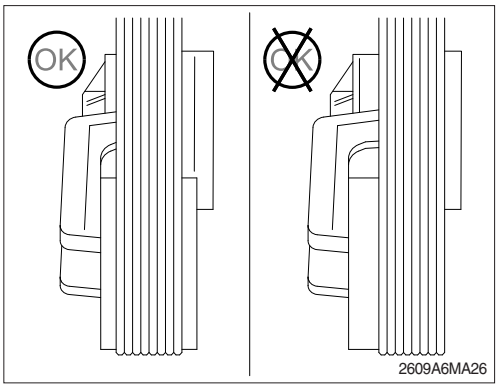


(3) With the belt removed, verify that the tensioner arm stop is in contact with the spring case stop.
If these two are not touching, the tensioner must be replaced.

※ **After replacing the belt, if the tensioner arm stop is still in contact with the spring case stop, the tensioner MUST be replace.**



(4) Check the location of the drive belt on the belt tensioner pulley. The belt should be centered on, or close to the middle of, the pulley. Misaligned belts, either too far forward or backward, can cause belt wear, belt roll-offs, or increase uneven tensioner bushing wear.



10) CLEANING OF AIR CLEANER

(1) Primary element

① Open the cover and remove the element.

② Wipe all contaminant and debris from inside the housing body.

③ Do not clean the filter element by striking or hitting the filter against any object to shake the debris from the filter element.

④ Clean the filter element with compressed air.

a. Remove dust from filter element by directing the compressed air into the opening of the air filter element.

b. Use 3 kg/cm^2 (40 psi) maximum air pressure and hold the compressed air nozzle at least 2.5 cm (1") away from the pleats while cleaning. Make sure to keep the clean side of air filter free of debris.

⑤ Visually inspect for damage to the filter elements and components. Use a light source to help identify any defects in the media. If any defects are observed discard the filter element and replace with a new primary filter element.

a. Before any type of cleaning, a visual inspection of the filter is needed. If there is any damage to the filter body, gaskets or endplates, do not clean or reuse; the filter should be discarded. Always clean filters in a clean environment, observe strict inspection procedures and repackage filters immediately after the cleaning process with appropriate materials.

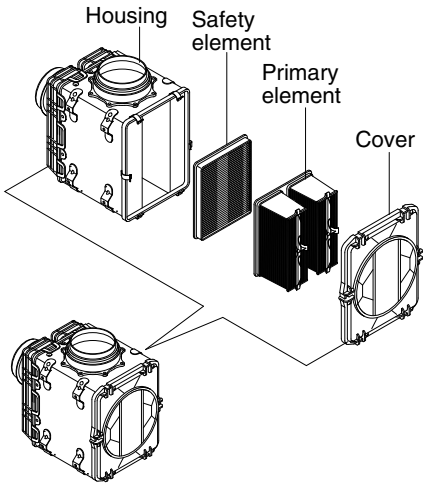
b. Use observe proper safety precautions and dispose of waste materials in an environmentally compliant manner.

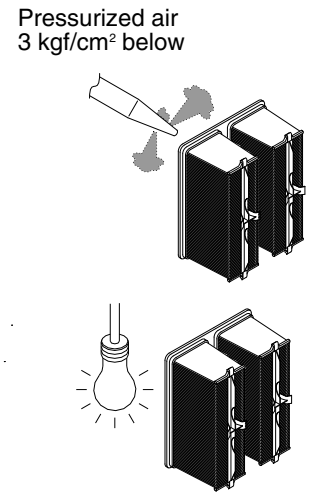
⑥ Re-install filter element into the air housing.

⑦ Replace the primary element at the fourth cleaning.

(2) Safety element

The safety filter element should never be cleaned since the safety filter is the last barrier to contaminant before it reaches engine/equipment. The useful life of the safety filter is equivalent to that of the primary air filter only if the primary filter element is being regularly cleaned. If the primary filter element is not cleaned, the safety filter should be changed at every third primary air filter change or after one year of continuous service, whichever occurs first.





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11) FUEL TANK

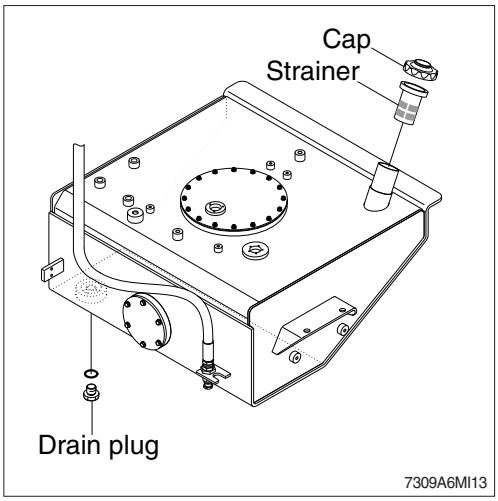
(1) Fill fuel fully when system the operation to minimize water condensation, and check it with fuel gauge before starting the machine.

(2) Drain the water and sediment in the fuel tank by opening the drain cock.

※ Be sure to LOCK the cap of fuel tank.

※ Remove the strainer of the fuel tank and clean it if contaminated.

⚠ Stop the engine when refueling.
All lights and flames shall be kept at a safe distance while refueling.



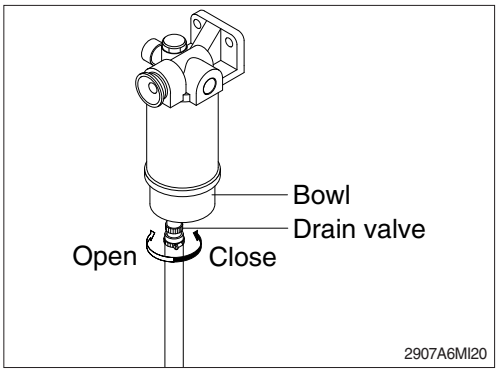
12) PREFILTER

※ Inspect or drain the collection bowl of water daily and replace the element every 500hours.

(1) Drain water

① Open bowl drain valve to evacuate water.

② Close drain valve.



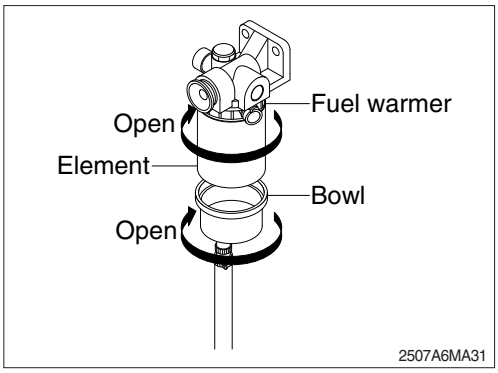
(2) Replace element

① Drain the unit of fuel. Follow "Drain water" instructions above.

② Remove element, fuel warmer and bowl from filter head.

※ **The bowl is reusable, do not damage or discard.**

③ Separate element from bowl. Clean bowl and seal gland.

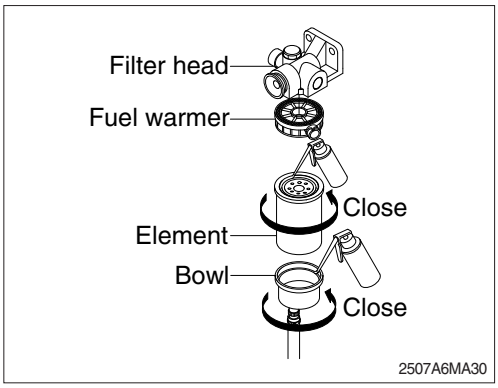


④ Lubricate new bowl seal with clean fuel or motor oil and place in bowl gland.

⑤ Attach bowl to new element firmly by hand.

⑥ Lubricate new element seal and place in element top gland.

⑦ Attach the element, fuel warmer and bowl to the head.



13) REPLACEMENT OF FUEL FILTER

(1) Use fuel filter wrench, loosen and remove the fuel filter.

※ Make sure O-ring does not stick to fuel filter head.
Remove O-ring with screwdriver, if necessary.

(2) Lubricate the fuel filter O-ring with clean lubricating oil.

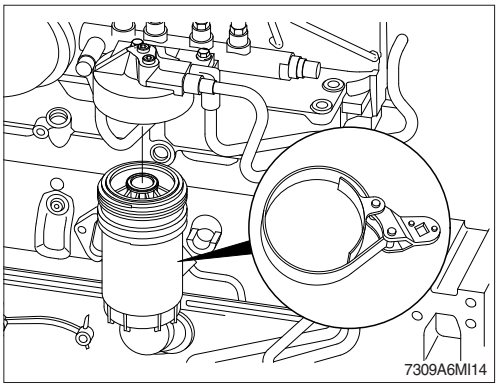
(3) Install the filter on the filter head. Tighten the filter until the gasket contacts the filter head surface. Tighten the fuel filter an additional 3/4 turn after contact.

※ Mechanical overtightening can distort the threads or damage the filter element seal.

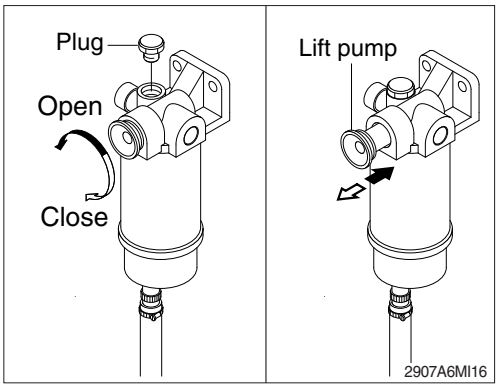
(4) Relieve the air after mounting.

※ Do not pre-fill an on-engine fuel filter with fuel. The system must be primed after the fuel filter is installed. Pre filling the fuel filter can result in debris entering the fuel system and damaging fuel system components.

※ Check for fuel leakage after the engine starts. If air is in the fuel system, the engine will not start. Start engine after bleeding the air according to the method of bleeding air.



14) BLEEDING THE FUEL SYSTEM



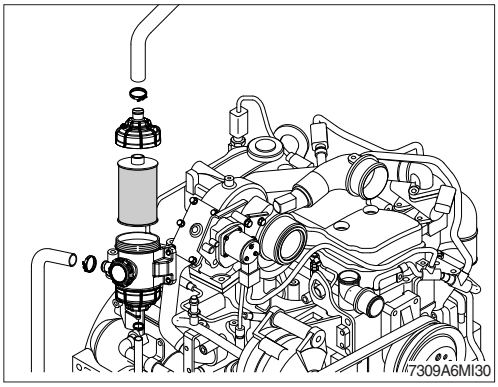
(1) Loosen fuel supply line plug at the outlet of pre-filter.

(2) Do hand-priming the lift pump repeatedly until air bubbles comes out from fuel supply line completely.

(3) Tighten fuel supply line to its origin position.

⚠ **The fuel pump, high-pressure fuel lines, and fuel rail contain very high-pressure fuel. Do not loosen any fittings while the engine is running. Personal injury and property damage can result. Wait at least 10 minutes after shutting down the engine before loosening any fittings in the high-pressure fuel system to allow pressure to do decrease to a lower level.**

15) CRANKCASE VENTILATION FILTER



(1) Disconnect the crankcase ventilation hose.

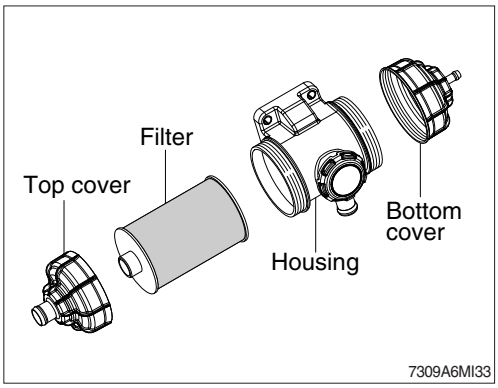
※ **The replaceable filter element can be removed from either the top or the bottom, with the crankcase breather housing**

(2) To remove the filter, grasp either the top inlet cover or the bottom drain cover and turn **counterclockwise**.

(3) Remove the filter element.

※ **Do not attempt to clean the filter element with solvent or any other cleaning agent, in order to extend the filter element's life.**

※ **Do not spray solvent into the crankcase ventilation housing. Solvent sprayed into the housing can drain into the oil pan through the housing drain tube.**

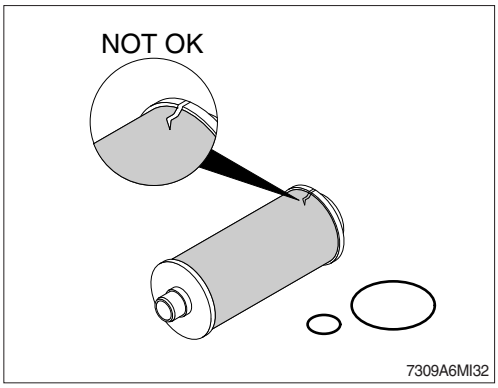


(4) Clean the interior of the crankcase ventilation filter housing and cover with a clean shop towel and solvent.

(5) Dry the housing and covers with a clean shop towel.

(6) If the crankcase ventilation filter was removed and will be reused, inspect the seals and filter media for tears, cuts, or brittleness.

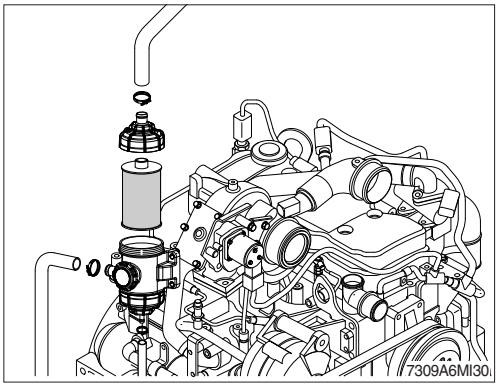
(7) Replace the filter if damage is found.



(8) Install the filter into the crankcase ventilation breather housing. The filter can be installed with either end up.

(9) Install the breather housing cover that was removed to access the filter by rotating **clock-wise** and tighten hand-tight.

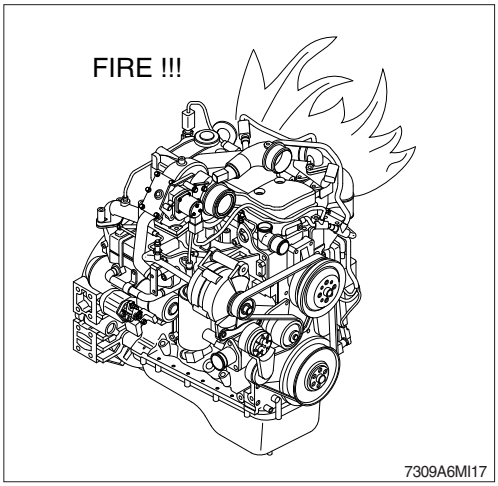
※ **The cover with the 10 mm (0.39") drain port must always point downward.**
The cover with the 25.4 mm (1") inlet port must always point upward.



(10) Install the crankcase ventilation hose.

16) LEAKAGE OF FUEL

⚠ **Be careful and clean the fuel hose, injection pump, fuel filter and other connections as the leakage from these part can cause fire.**



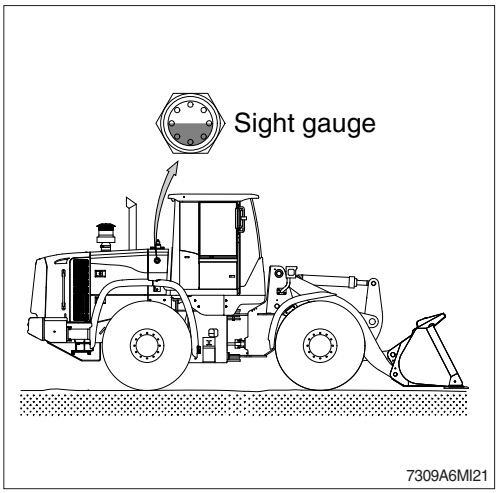
17) HYDRAULIC OIL CHECK

(1) Lower the bucket on the ground at a flat location as in the illustration.
Stop the engine and then leave for about 5 minutes.

(2) Check the oil level at the sight gauge. The sight gauge is located on the left side of the hydraulic oil tank.

(3) The sight gauge should indicate the middle position.

※ **Add hydraulic oil, If necessary.**



18) FILLING HYDRAULIC OIL

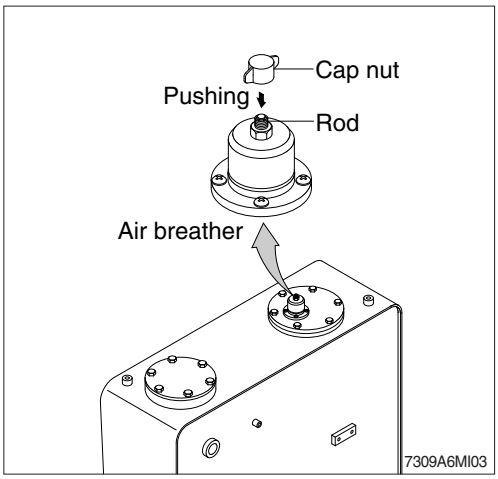
(1) Stop the engine to the position of level check.

(2) Rotate the cap nut counter-clockwise by hand and push the rod to release the air pressure.

(3) Remove the breather on the top of oil tank and fill the oil to the specified level.

(4) Start engine after filling and operate the work equipment several times.

(5) Check the oil level at the level check position after engine stops.



19) CHANGE THE HYDRAULIC OIL

(1) Lower the bucket on the ground extend the bucket cylinder to the maximum.

(2) Loosen the cap and relieve the pressure in the tank by pushing the top of the air breather.

(3) Prepare a suitable container.

(4) To drain the oil loosen the drain plug at the fuel tank block.

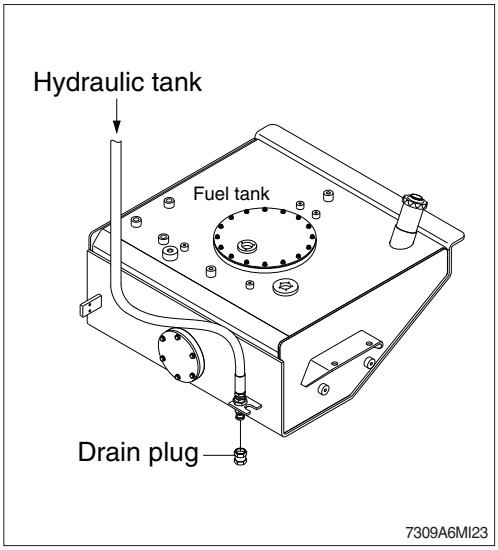
(5) Tighten the drain plug.

(6) Fill proper amount of recommended oil.

(7) Put the breather in the right position.

(8) Start engine and run continually. Release the air by full stroke of control lever.

※ **The oil must be free of bubbles. If bubbles are present in the oil, air is entering the hydraulic system. Inspect the suction hoses and hose clamps.**



20) CLEANING AND REPLACING RETURN FILTER

Clean and replace the return filter in the following manner.

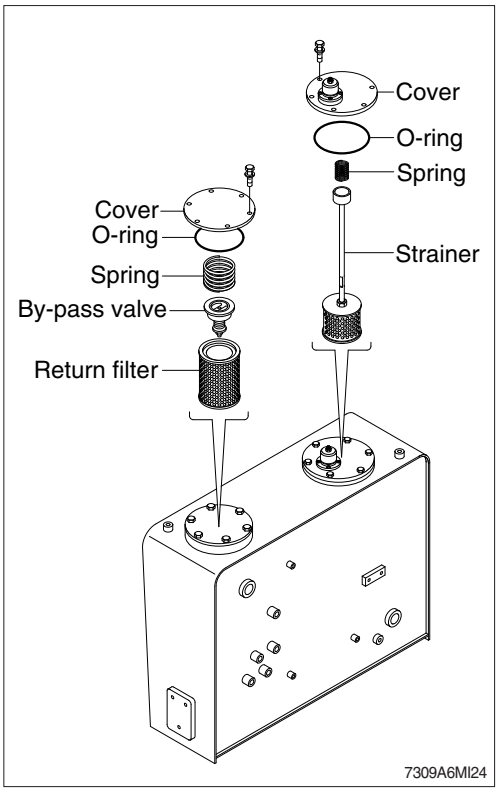
(1) Remove the cover.

(2) Remove spring, by-pass valve and return filter from the tank.

(3) Replace element with new one and assemble spring and by-pass valve after cleaning.

(4) Install the cover on the tank.

· Tightening torque : 6.9±1.4 kgf · m
(50±10 lbf · ft)



21) REPLACEMENT OF ELEMENT IN HYDRAULIC TANK BREATHER

(1) Loosen the cap and relieve the pressure in the tank by pushing the top of the air breather.

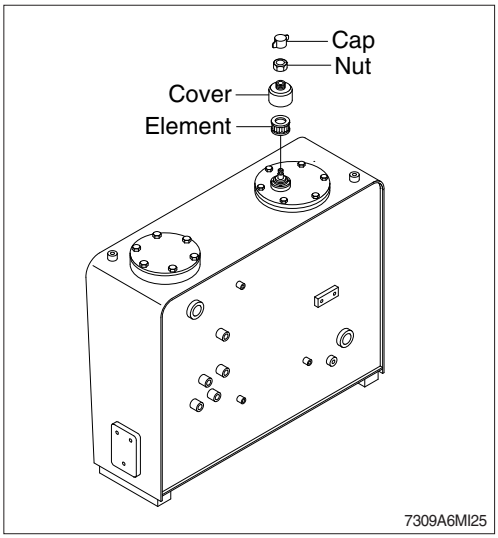
(2) Loosen the lock nut and remove the cover.

(3) Pull out the filter element.

(4) Replace the filter element new one.

(5) Reassemble by reverse order of disassembly.

· Tightening torque : 0.2~0.3 kgf · m
(1.4~2.1 lbf · ft)

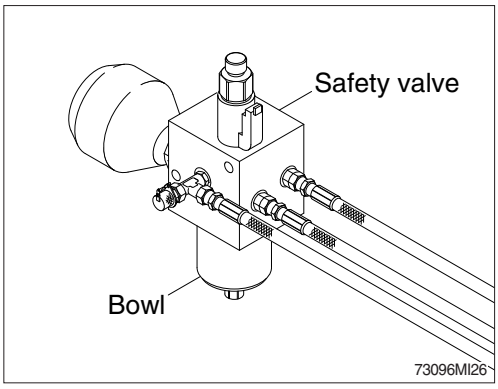


22) REPLACE OF PILOT LINE FILTER

(1) Loosen the bowl positioned on the safety valve.

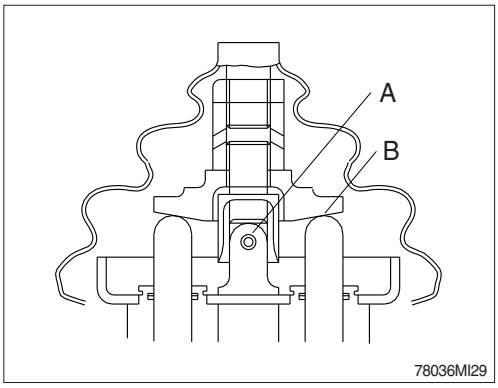
(2) Pull out the filter element and clean the bowl.

(3) Install the new element and tighten the bowl using spanner.
· Spanner size : 27 mm



23) LUBRICATE RCV LEVER

Remove bellows and grease the joint (A) and the sliding parts (B).

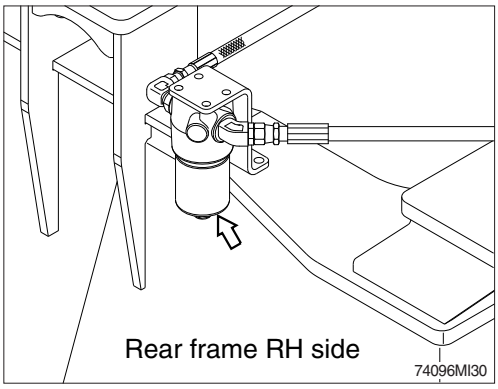


24) REPLACE OF BRAKE PRESSURE FILTER

(1) Loosen the nut on the filter body.

(2) Pull out the filter element and clean filter housing.

(3) Install the new element and tighten the nut using the spanner (36 mm).



25) TIRE PRESSURE

(1) Inappropriate tire pressure is a primary cause for tire damage. Insufficient tire pressure will damage internal carcass of tire. Repeated excessive bending will damage or break the carcass. Excessive pressure will also cause premature damage of tire.

(2) Recommended tire pressure (When tire is cooled)

Size	Pressure
17.5-25, 12PR (L3)	3.5 bar (50 psi)
17.5 R25, ★(L3)	4.2 bar (60 psi)

(3) Continuous operation will produce heat and increase pressure on tire. But such phenomenon was already taken into account when designing a tire. Do not try to remove normally increased air because tires may be crushed or overinflated.

(4) The three major causes for excessive heat and pressure of tire are insufficient pressure, excessive load and overspeed. Avoid excessive load and overspeed in order to keep tires in good shape.

⚠ Do not inflate tires using flammable gases or alcohol injector.
This cause explosion or personal injury.

⚠ Inflate tires at the pressure level recommended by the manufacturer, and check periodically pressure and wear of tires.

⚠ When replacing the inflated tire, do not stand near the tire.

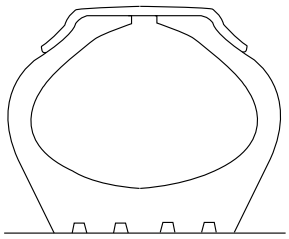
※ Check the tire when the tire is at normal temperature and the machine is not loaded.

⚠ Do not use recycled wheel parts.

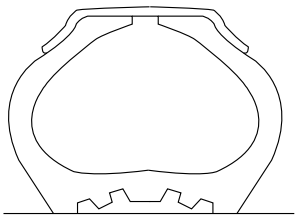
⚠ When removing lockering or inflating tire, use safety cable or chain to ensure safety.

※ Be sure to bleed air before removing lockering.
Never inflate tires unless the lockering is assembled in its place.

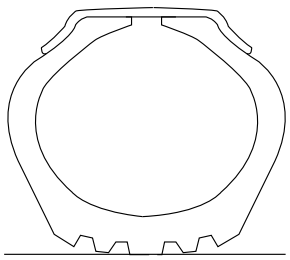
① Avoid the followings when traveling.
② Rubbing tires against road bank or rack at cargo-unloading spot.
③ Tires slippage during working.
④ Abrupt starting of machine.
When oil, grease or gasoline smeared on tire, clean those. Otherwise it may cause of permanent deformation.



Normal



Too low pressure



Excess pressure

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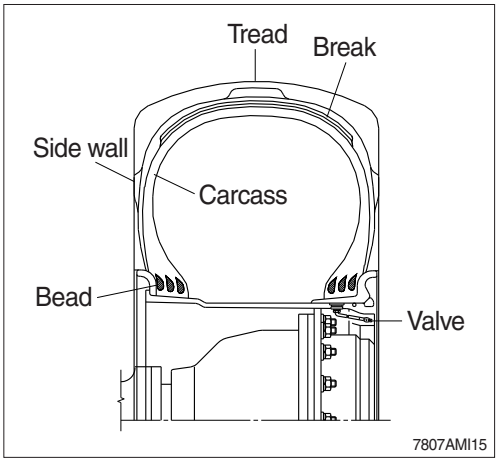
26) REPLACEMENT OF TIRE

⚠ Disassembly, reassembly, replacement and repair of tire requires special skills and equipment. Contact a tire repair shop.

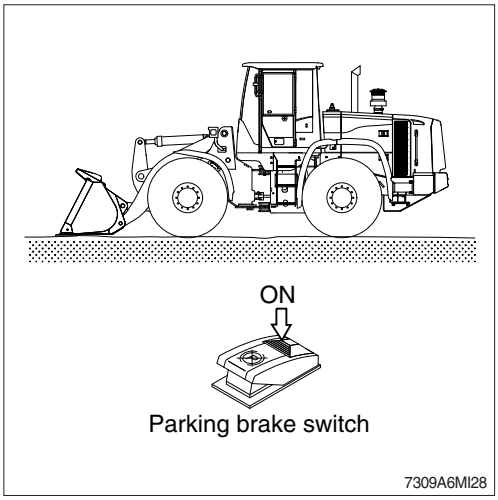
(1) Tires to be replaced

① Tires with broken or bent bead wires
② Tires exposed more than 1/4 of carcass fly.
③ Tires whose carcass is damaged more than 1/3 of the tire width.
④ Tires which show fly separation.
⑤ Tires which has a radial crack near the carcass.
⑥ Tires which are judged to be unsuitable for use because of deformation or damage.

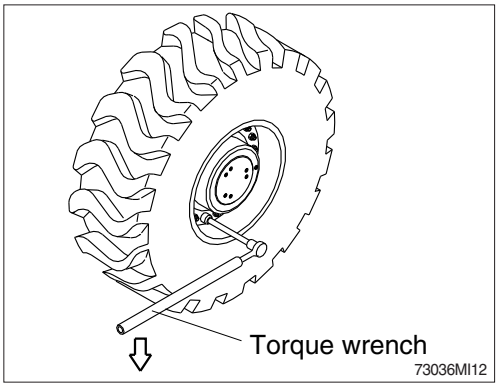


(2) Separation of tire

① After moving the machine to flat ground, lower the bucket to the ground and turn the parking brake switch ON.

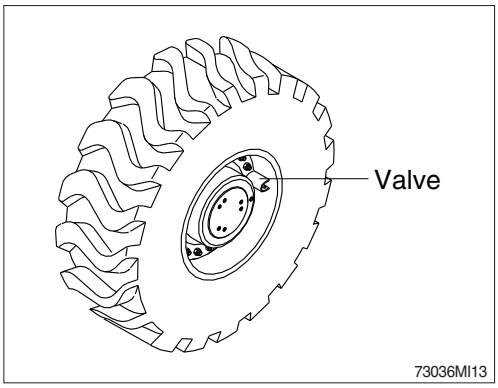


② Loosen slightly all wheel mounting.
· Tools : Socket 32 ㎜
Torque wrench
Extension bar
③ Lift the machine with a jack.
④ Loosen all wheel mounting nuts and replace the tire.



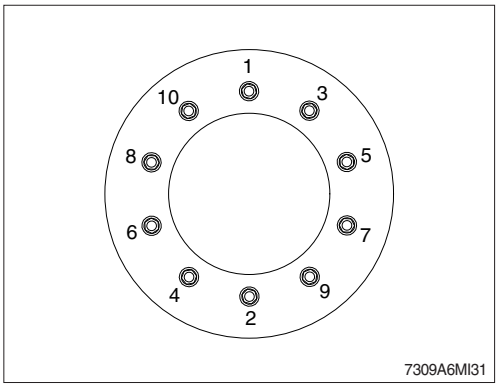
(3) Direction of tire to be installed

① Be careful that the valve should be facing the outside.



(4) Mounting of tire

① Lightly tighten nuts as shown in the illustration.
② Lower the jack after tire is replaced.
③ Tighten nuts according to the specified tighten torque.
· Tightening torque : 77.4±11.6 kgf · m
(560±83.9 lbf · ft)

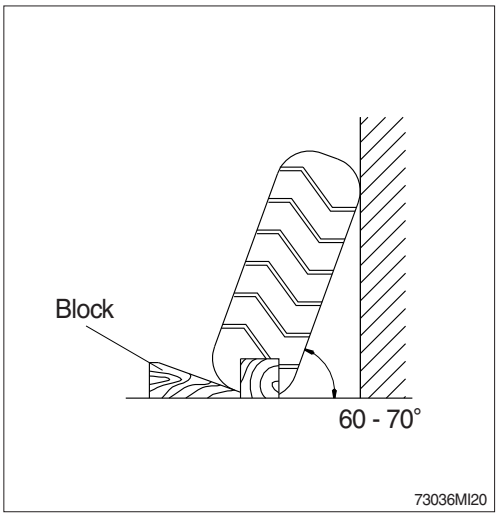


27) STORING TIRES AFTER REMOVAL

As a basic rule, store the tires in a warehouse which unauthorized persons cannot enter. If the tire are stored outside, always erect a fence around the tires and put up "No Entry" and other warning signs that even young children can understand.

Stand the tire on level ground, and block it securely so that it cannot roll or fall over.

If the tire should fall over, get out of the way quickly. The tires for construction equipment are extremely heavy, so trying to hold the tire may lead to serious injury.



28) CHECK TRANSMISSION OIL LEVEL

(1) The oil level check must be carried out as follows; oil level check (weekly).

(2) Before the oil level check, Transmission must have been running to warm up enough.

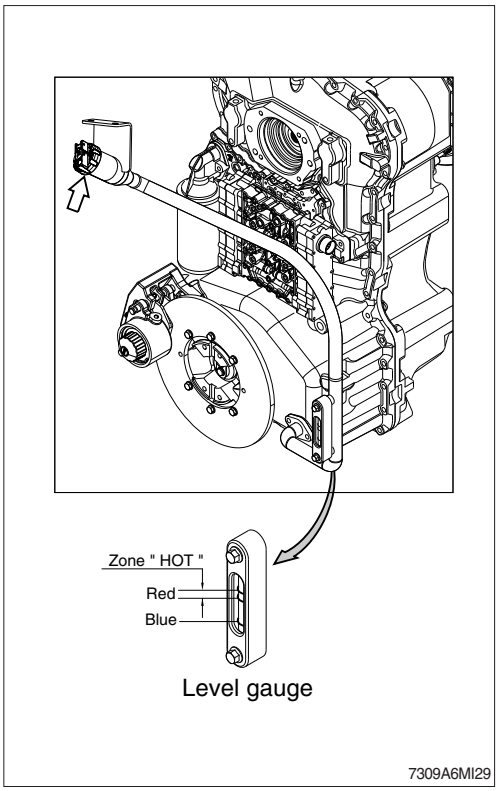
(3) When the oil level is checked, machine must be on flat ground and engine must be at idling speed, transmission must be in neutral position.

(4) Check the oil level on level (sight) gauge.

(5) Oil level

- Operating temperature (about 80~90˚C)
  :The Oil level must be lying in zone HOT (between two red lines).
- Cold phase (about 40˚C)
  :The Oil level must be lying near cold mark (blue line).

⚠ When checking, press the parking brake switch and fix the front and rear frames with the safety lock bar.



29) REPLACEMENT OF TRANSMISSION OIL AND FILTER ELEMENT

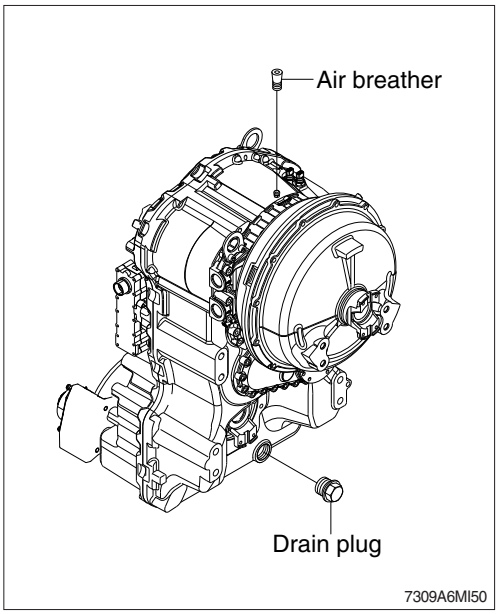
(1) Operate the machine for a few minutes in order to warm the transmission oil.

(2) Move the machine to flat ground. Lower the bucket to the ground and slightly apply downward force.

(3) Press the parking brake switch and stop the engine.

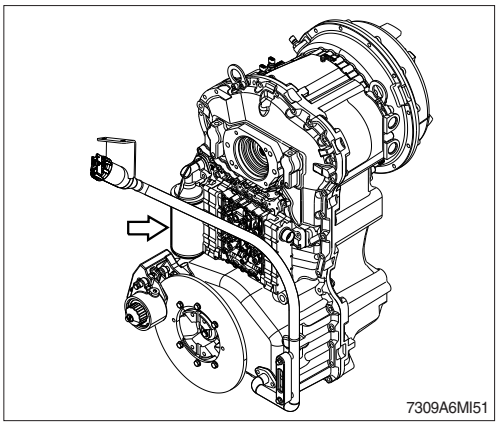
(4) Open transmission air breather to relieve internal air pressure.

(5) Remove the transmission drain plug. Allow the transmission oil to drain into a suitable container.



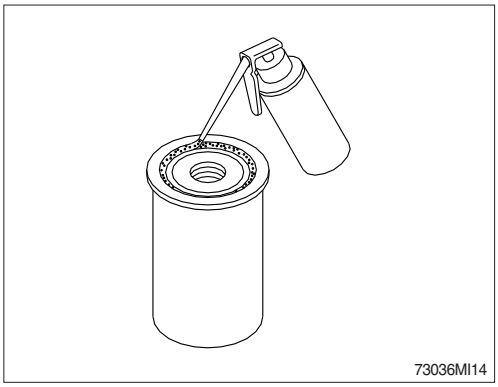
(6) Remove the transmission oil filter cartridge.
Dispose of the used transmission oil filter cartridge properly.

(7) Clean the filter cartridge mounting base.
Remove any part of the filter cartridge gasket that remains on the filter cartridge mounting base.



(8) Apply a light coat of oil to the gasket of a new transmission oil filter cartridge.

(9) Install the new transmission oil filter cartridge.
Screw the filter in until contacts with the sealing surface is obtained and tighten it now by hand about 1/3 to 1/2 turn.



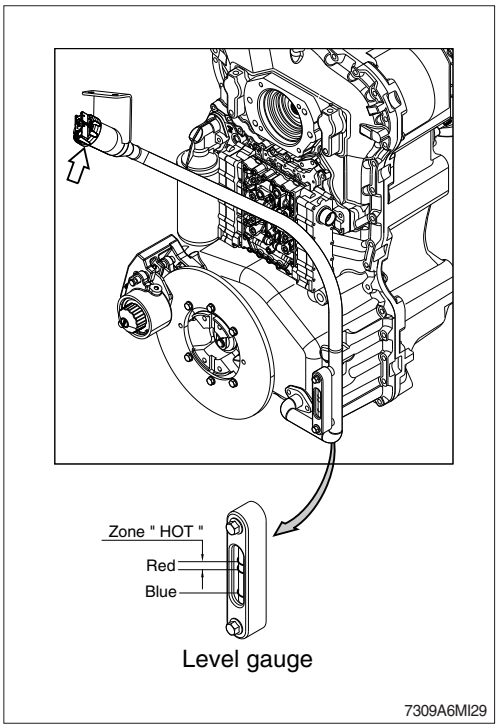
(10) Fill the oil through filler cap and check if the oil is at the appropriate level.

(11) The proper oil amount is 20 liters. (5.3 U.S. gallons)

⚠ As the machine is hot after operation wait until the temperature has dropped.

⚠ It is imperative to pay attention to absolute cleanliness of oil and filter.
Binding is in any case the marking on the oil level gauge.

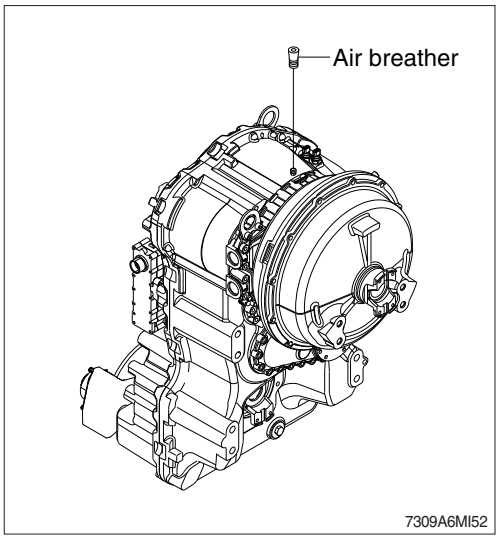
※ Prohibition to inject water to filler cap directly when you wash the machine.



30) CLEANING TRANSMISSION AIR BREATHER

(1) Remove dust or debris around the air breather.

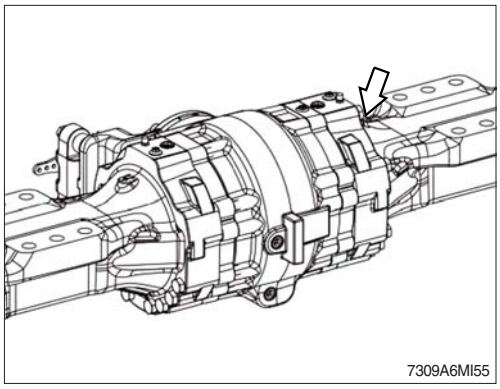
(2) Remove the air breather and wash it with cleaning oil.



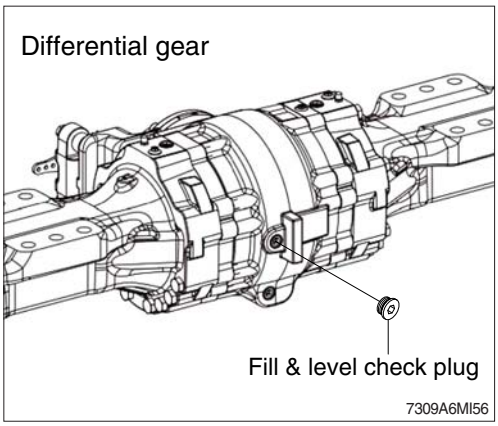
31) CHECK AND SUPPLYING AXLE OIL

(1) Move the machine to flat ground.

(2) Open the axle air breather to relieve internal air pressure.



(3) Remove the plug and check the oil amount.
If the oil level is at the hole of the plug, it is normal.

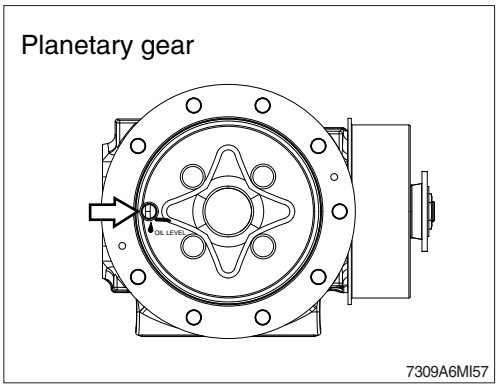


(4) If the oil level is below the plug hole, supply oil through a plug hole.

⚠ When checking the oil level, press the parking brake switch and fix front and rear frames using the safety lock bar.

⚠ As the machine is hot after operation, wait until the temperature has dropped.

※ Set the plug of planetary gear in parallel to the ground.



32) CHANGE THE AXLE OIL

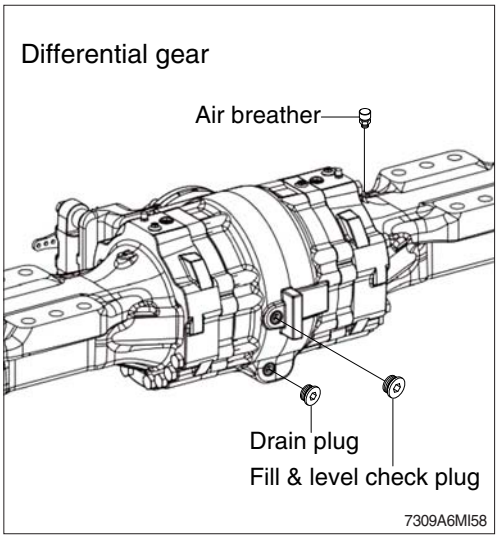
(1) Place a case under drain plug to catch oil.

(2) Remove the air breather to relieve internal pressure.

(3) Drain oil the differential gear.

① Remove the refilling plug and remove the drain plug to drain oil off.

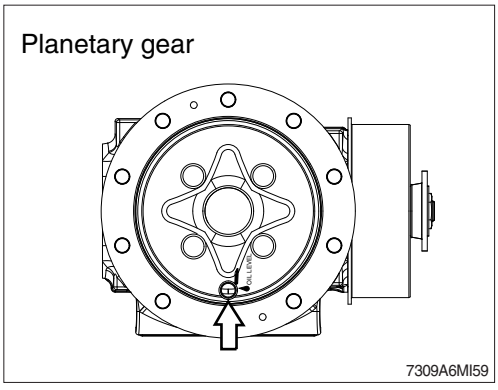
② Wash drain plug and install it.



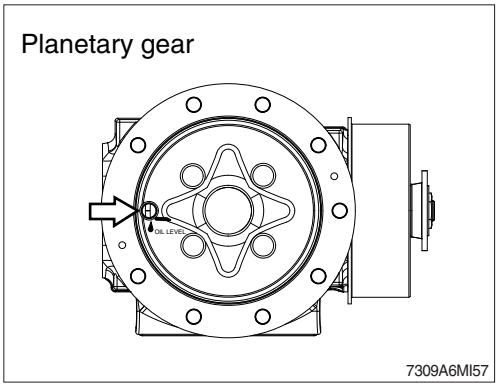
(4) Drain oil planetary gear.

① Drain oil by removing drain plug.

※ The drain plug should be facing the ground.



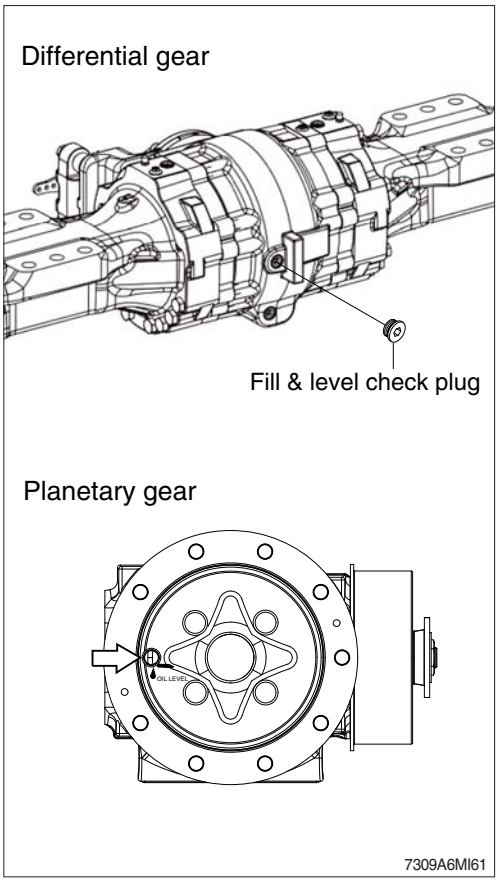
(5) After draining, put the drain plug of planetary gear in parallel to the ground.



(6) Supply oil into the differential gear and the planetary gear.
- Oil amount
  Front axle : 17 ℓ (4.5 U.S. gal)
  Rear axle : 17 ℓ (4.5 U.S. gal)

(7) Supply oil until it overflows from the oil filler, then install the plug.

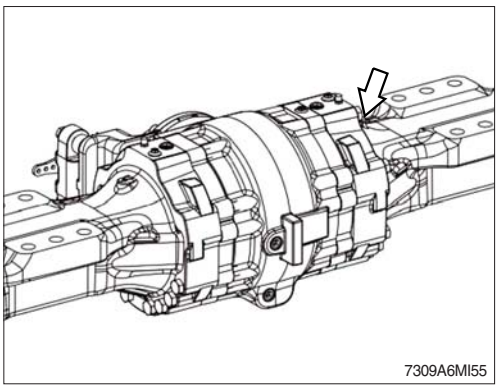
⚠ **As the machine is hot after operation, wait until the temperature has dropped.**
If a work requires frequent use of brake, replace it earlier than normal change interval.



33) CLEANING AXLE BREATHER

(1) Remove dust or debris around the breather.

(2) Remove the breather and wash it with cleaning oil.



34) LUBRICATION

(1) Supply grease through the grease nipple, using grease gun.

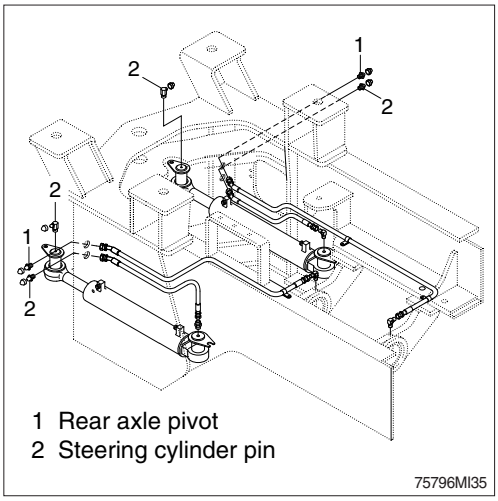
(2) After lubricating, clean off spilled grease.

⚠ **Press the parking brake switch and fix front and rear frames using the safety lock bar.**

⚠ **Set the work equipment in a stable position and push the pilot cut off switch to the OFF position.**

(3) Rear axle pivot : 2EA

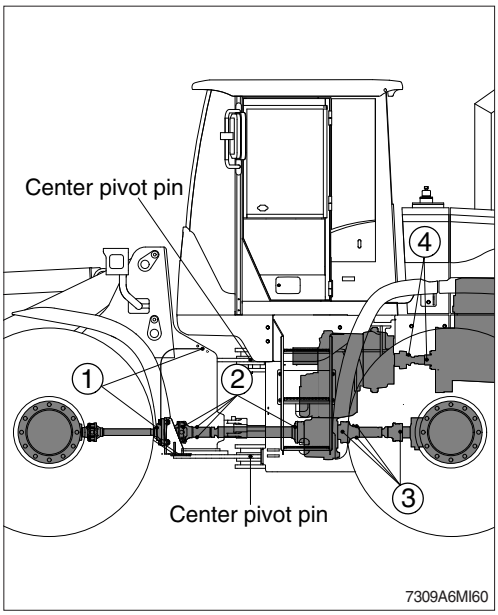
(4) Steering cylinder pin : 4EA



(5) Center pivot pin : 2EA

(6) Drive shaft

① Front (flange bearing, journal bearing) : 2EA
② Center (sleeve yoke, journal bearing) : 4EA
③ Rear (sleeve yoke, journal bearing) : 4EA
④ Upper (sleeve yoke, journal bearing) : 2EA



35) REPLACEMENT OF BOLT ON CUTTING EDGE

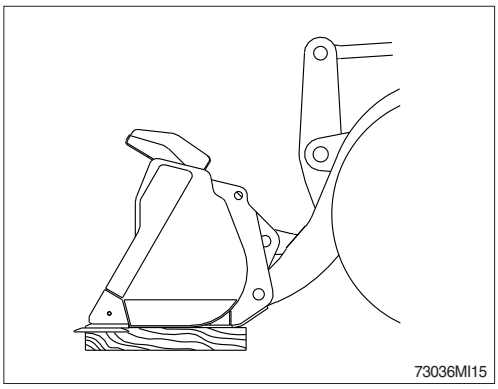
(1) Replacement time

Replace the cutting edge before it has worn out to the end of bucket.

(2) Replacement method

⚠ Make sure the work equipment does not move when replacing the cutting edge.
Set the work equipment in a stable position, put the pilot cut off switch in the OFF position.

① Lift the bucket to a proper height and insert blocks so that the bucket does not fall down.
② Loosen bolts and nuts, and remove the cutting edge.
③ Clean the contacted surface.
④ Turn the cutting edge and install on the bucket.
※ **If both sides have worn out, replace it with new ones.**
※ **If the contacted face of cutting edge has worn out, repair the contacted face of it.**
⑤ Tighten evenly bolts and nuts to remove the clearance between bucket and cutting edge.
· Tightening torque : 62.8±9.4 kgf · m
(454±68 lbf · ft)
⑥ After a few hours of operation, retighten bolts.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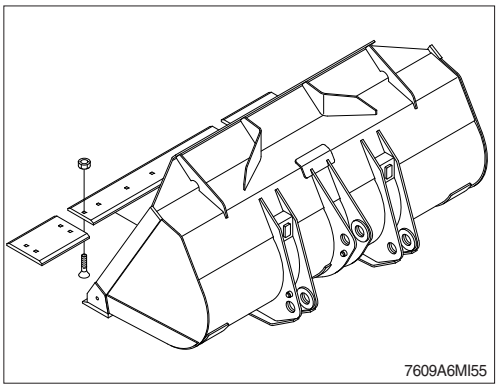
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36) REPLACEMENT OF BUCKET TOOTH

(1) Replacement time

Replace the bucket tooth before it has worn out to the end of the bucket.

(2) Replacement method

⚠ **Make sure the work equipment does not move when replacing the bucket tooth.**
Set the work equipment in a stable position, put the pilot cut off switch in the OFF position and stop the engine.

① Lift the bucket to a proper height and insert blocks so that the bucket does not fall down.

② Loosen bolts and nuts, and remove bucket tooth.

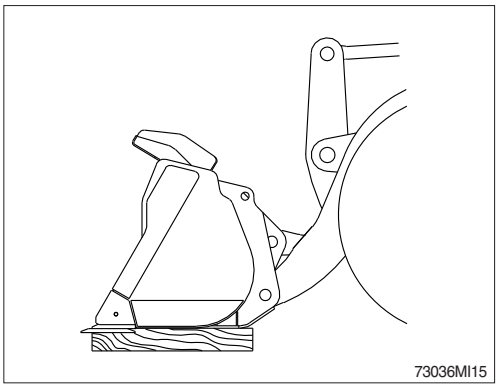
③ Clean the contacted surface.

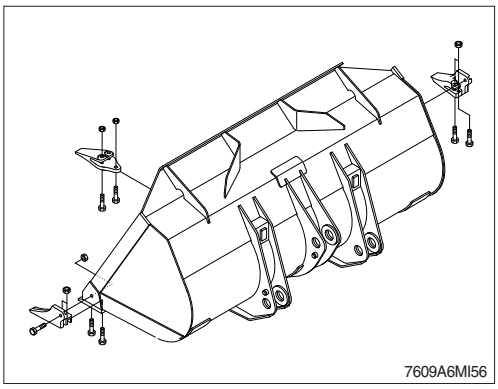
※ **If the contacted face of bucket tooth has worn out, repair the contacted face of it.**

④ Install new bucket tooth on the bucket, and tighten bolts and nuts.

· Tightening torque : 62.8±9.4 kgf · m
(454±68 lbf · ft)

⑤ After a few hours of operation, retighten bolts.



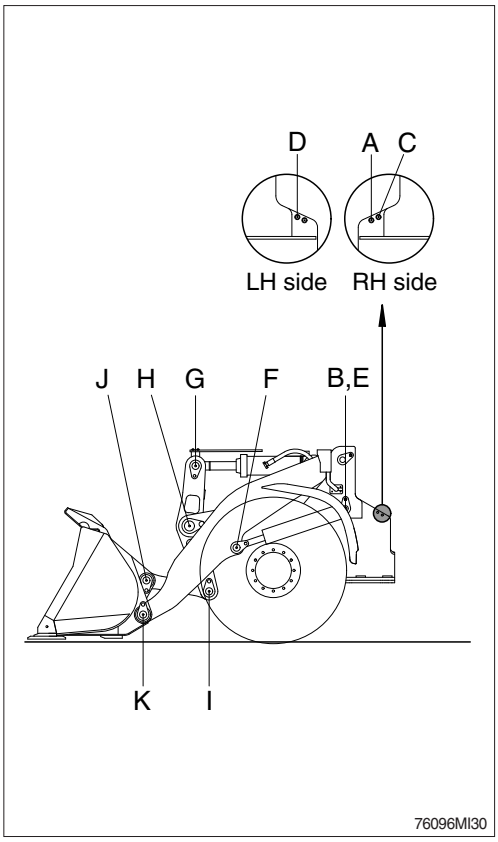


37) MAINTENANCE OF WORK EQUIPMENT

(1) Lubricate to each pin of working device.
Lubricate the grease to grease nipple in accordance with lubrication intervals.

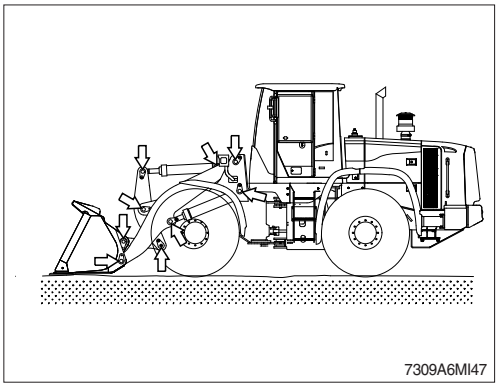
No.	Description	Qty
A	Bucket cylinder (front frame side) pin	1
B	Boom cylinder (front frame side) right pin	1
C	Boom-front frame right connection pin	1
D	Boom-front frame left connection pin	1
E	Boom cylinder (front frame side) left pin	1
F	Boom cylinder-boom connection pin	2
G	Bucket cylinder-bell crank connection pin	1
H	Boom-bell crank connection pin	1
I	Bell crank-bucket link connection pin	1
J	Bucket-Bucket link connection pin	2
K	Bucket-boom connection pin	2

※ Shorten lubricating interval when working in the water or dusty place.



(2) Check for wear and tear of work equipment pins and bushings.

(3) Check for damage of boom and bell crank.

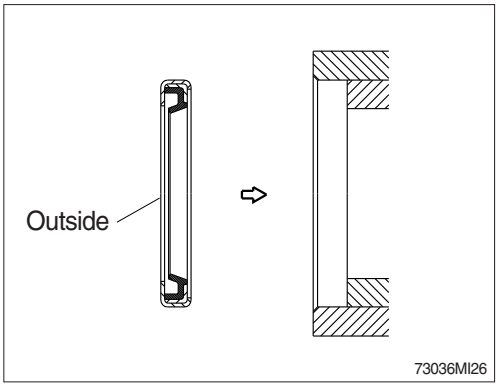


(4) Dust seal are mounted on the rotating part of working device to extend the lubricating interval.

※ Mount the lip to be faced out side when replace the dust seal.

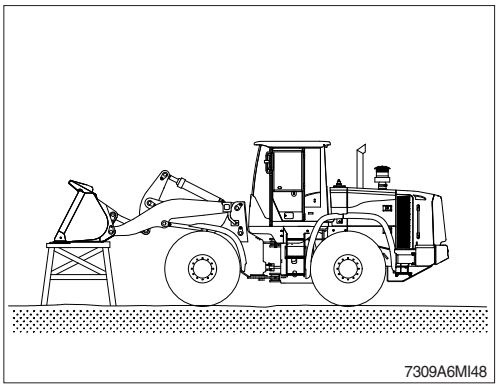
※ If it is assembled in wrong direction, it will cause fast wear of pin and bushing, and create noise and vibration during operation.

※ Make sure the seals are not damaged or deformed.



38) WORK EQUIPMENT SUPPORT

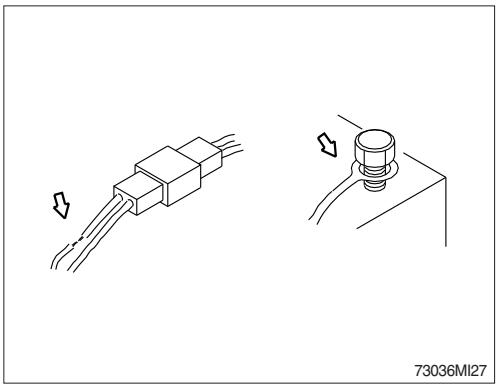
When carrying out inspection and maintenance with the equipment raised, fit a stand under the lift arm securely to prevent the work equipment from coming down. In addition, set the work equipment control levers to the Hold position and put the pilot cut off switch to the OFF position.



7. ELECTRICAL SYSTEM

1) WIRING, GAUGES

Check regularly and repair loose or malfunctioning gauges when found.



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2) BATTERY

(1) Clean

① Wash the terminal with hot water if it is contaminated, and apply grease to the terminals after washing.

⚠ Battery gas can explode. Keep sparks and flames away from batteries.

⚠ Always wear protective glasses when working with batteries.

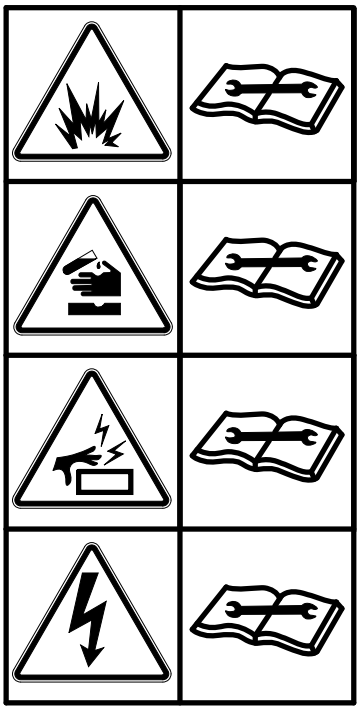
⚠ Do not stain clothes or skin with electrolyte as it is acid.
Be careful not to get the electrolyte in eyes.
Wash with clean water and go to the doctor if it enters the eyes.

⚠ Avoid short-circuiting the battery terminals through accidental contact with metallic objects, such as tools, across the terminals.

⚠ Do not store tools, bucket tooth and other flammable things in battery box. They could cause a fire.

⚠ Tighten the battery terminals securely. Loosened terminals can generate sparks and lead to explosion.

⚠ Make sure that the battery terminal's caps always are installed.



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(2) Recycle

Never discard a battery.

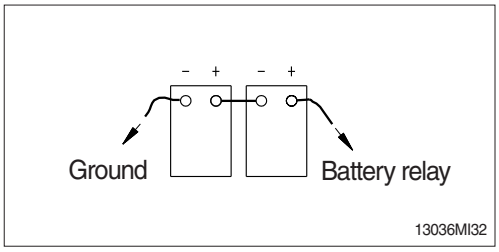
Always return used batteries to one of the following locations.

- · A battery supplier
- · An authorized battery collection facility
- · Recycling facility

(3) Method of removing the battery cable

Remove the cable from the ground connection first (⊖ terminal side) and reconnect it last when reassembling.

※ **Pay attention to the correct polarity.**



3) STARTING THE ENGINE WITH A BOOSTER CABLE

Keep following order when you are going to start engine using booster cable.

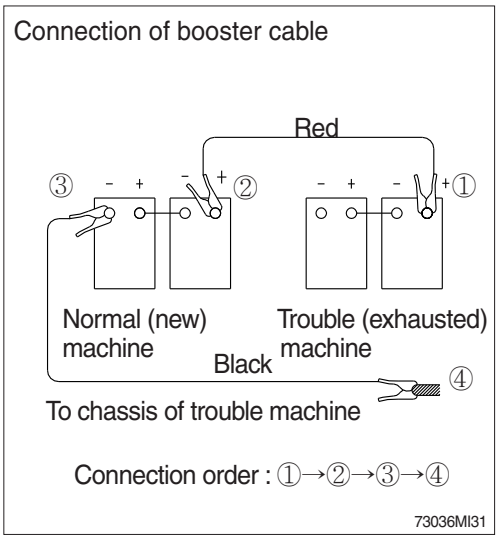
(1) Connection of booster cable

※ **Use the same capacity of battery for starting**

① Connect the red terminal of booster cable to the battery(+) terminal between exhausted and new battery.

② Connect the black terminal of the booster cable to the battery (-) terminal between exhausted and new battery.

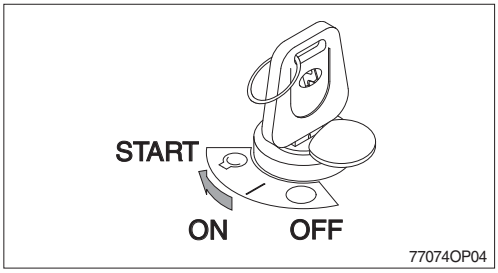
※ **Keep firmly all connection, the spark will be caused when connecting finally.**



(2) Starting the engine

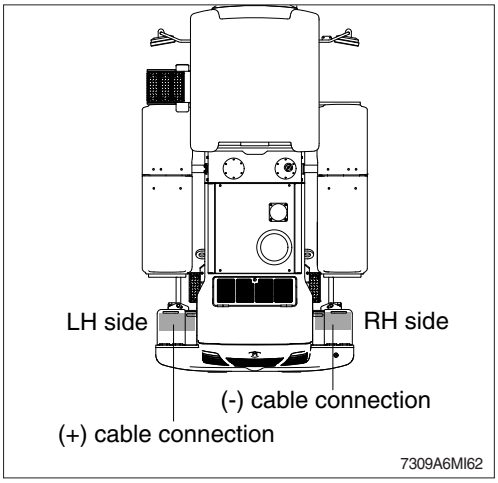
① Start engine with starting key.

② If you can not start it by one time, restart the engine after 2 minutes.



※ 24V power source is on left side battery of machine. Connect (+) booster cable on left side battery of machine.

※ Improper cable connection can cause damage to engine bearings and electric components.



(3) Taking off the booster cable

① Take off the booster cable (black).

② Take off the booster cable (red) connected to the (+) terminal.

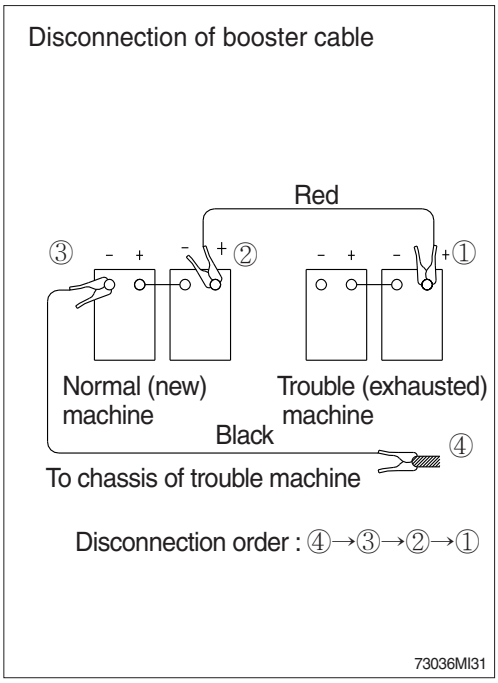
③ Run engine with high idle until charging the exhausted battery by alternator, fully.

⚠ **Explosive gas is generated while using the battery or charging it. Keep away flame and be careful not to cause the spark.**

※ **Charge the battery in the well ventilated place.**

※ **Place the machine on the earth or concrete. Avoid to charge the machine on the steel plate.**

※ **Do not connect (+) terminal and (-) terminal when connecting booster cable because it will be shorted.**



4) Welding repair

Before start to welding, follow the below procedure.

(1) Shut off the engine and remove the starting switch.

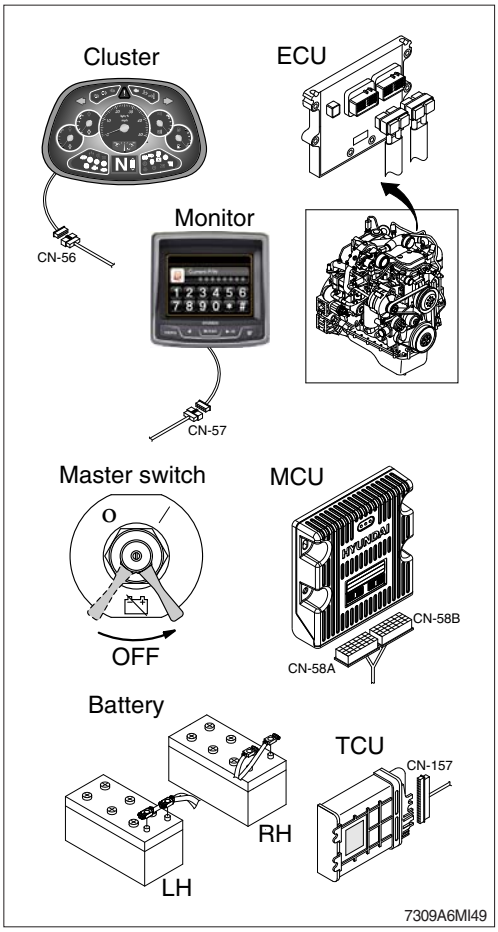
(2) Disconnect ground cable from battery by master switch.

(3) Before carrying out any electric welding on the machine, the battery cables should be disconnected and the connectors pulled out of the electronic control units (MCU, TCU, ECU, cluster, monitor etc).

(4) Connect the earth (ground) lead of the welding equipment as close to the welding points as possible.

※ **Do not weld or flame cut on pipes or tubes that contain flammable fluids. Clean them thoroughly with nonflammable solvent before welding or flame cutting on them.**

⚠ **Do not attempt to welding work before carry out the above.**
If not, it will caused serious damage at electric system.

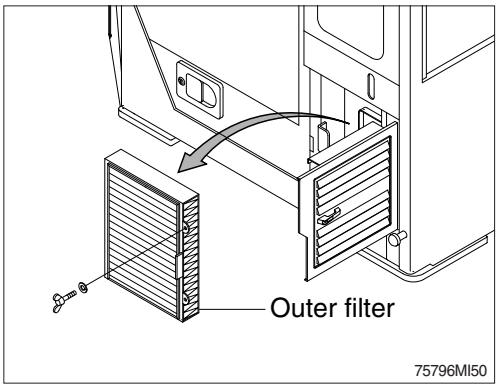


8. AIR CONDITIONER AND HEATER

1) CLEAN AND REPLACE OF OUTER FILTER

※ **Always stop the engine before servicing.**

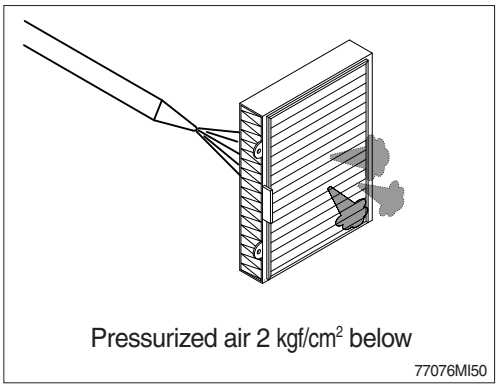
(1) Open the door, loosen the wing bolt and remove the outer filter.



(2) Clean the filter using a pressurized air (below 2 kgf/cm^2, 28 psi).

△ **When using pressurized air, be sure to safety glasses.**

(3) Inspect the filter after cleaning. If it is damaged or badly contaminated, use a new filter.

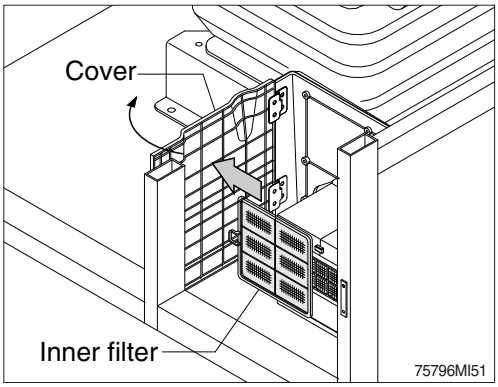


2) CLEAN AND REPLACE OF INNER FILTER

※ **Always stop the engine before servicing.**

(1) Open the cover.

(2) Remove the inner filter.

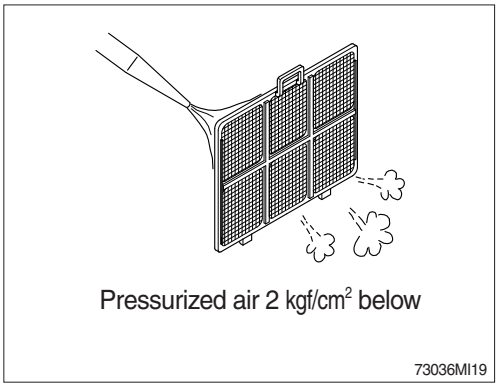


(3) Clean the inner filter using a pressurized air (below 2 kgf/cm^2, 28 psi) or washing with water.

△ **When using pressurized air, be sure to wear safety glasses.**

(4) Inspect the filter after cleaning. If it is damaged or badly contaminated, use a new filter.

※ **Dry off after washing with water.**



3) PRECAUTIONS FOR USING AIR CONDITIONER

(1) When using the air conditioner for a long time, open the window once every one hour.
(2) Be careful not to overcool the cab.
(3) The cab is properly cooled if the operator feels cool when entering there from outside (about 5˚C lower than the outside temperature).
(4) When cooling, change air occasionally.

4) CHECK DURING SEASON

Ask the service center for replenishment of refrigerant or other maintenance service so that the cooling performance is not damaged.

5) CHECK DURING OFF-SEASON

Operate the air conditioner 2 or 3 times a month (each for a few minutes) to avoid loss of oil film in the compressor.

6) REFRIGERANT

(1) Equipment contains fluorinated greenhouse gas.

Model	Type	Quantity	GWP
HL730-9A	HFC-134a	0.75 kg (1.65 lb)	1073 CO_2 eq.

※ GWP

Global warming potential (GWP) is a measure of how much heat a gas traps in the atmosphere relative to that of carbon dioxide (CO2). GWP is calculated in terms of the 100-year warming potential of 1 kg of a greenhouse gas relative to 1 kg of CO2.

(2) Environmental precautions

The air conditioning system of the machine is filled with HFC-134a refrigerant at the factory.
HFC-134a refrigerant is a flourinated greenhouse gas and contributes to global warming.
Do not release refrigerant into the environment.

(3) Safety precautions

Work on the air conditioning system must only be performed by a qualified service technician.
Do not attempt to preform work on the air conditioning system.
Wear safety goggles, chemical resistant gloves and appropriate personal protective equipment to protect bare skin when there is a risk of contact with refrigerant.

(4) Action in case of exposure

① Eye contact / Limited skin contact
Rinse with warm water and apply a light bandage. Seek medical attention immediately.
② Extensive skin contact
Rinse with warm water and carefully heat the area with warm water or warm clothing.
Seek medical attention immediately.
③ Inhalation
Leave the area and find fresh air. Seek medical attention immediately.