KOBELCO

OPERATOR'S MANUAL

HYDRAULIC EXCAVATOR

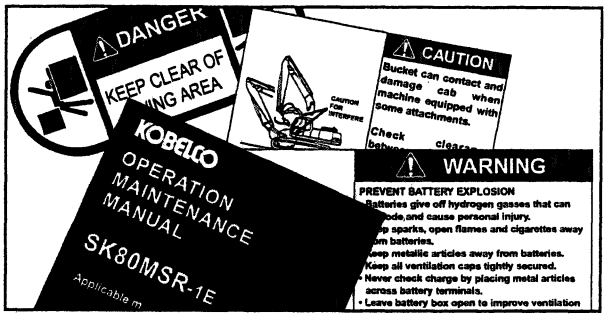
SK80MSR-1E

Applicable: SK80MSR-1E LF02-01001~

S2LF00003ZE01-00 10/02

1 3 PRE-START SAFETY

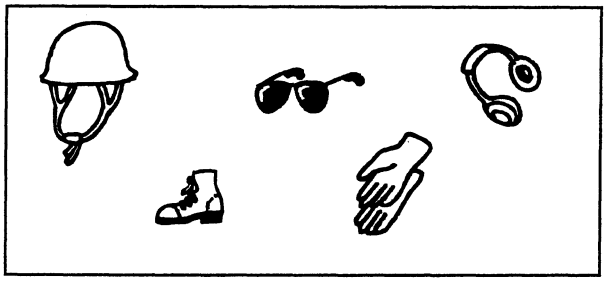
Many failures that occur during machine operation or servicing result from neglecting fundamental safety precautions The following safety precautions are given to prevent such failures, but they are only a part of what you must follow Read, understand and follow all safety precautions found in this manual and on the machine thoroughly before operating the machine



OBSERVE ALL SAFETY PRECAUTIONS

A OBSERVE SAFETY PRECAUTIONS

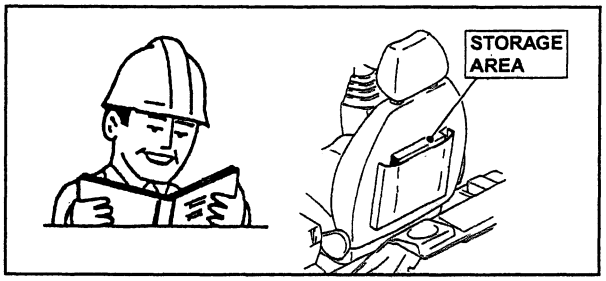
Follow all safety rules, precautions, and operating procedures If there are other personnel and flagmen working in the area, have them observe the specified signs



WEAR PROTECTIVE CLOTHING

B WEAR PROTECTIVE CLOTHING

Wear well fitting safety shoes, hard hat, and working clothes, and put on protective glasses, face shield, ear protection and gloves When necessary, wear reflective vest



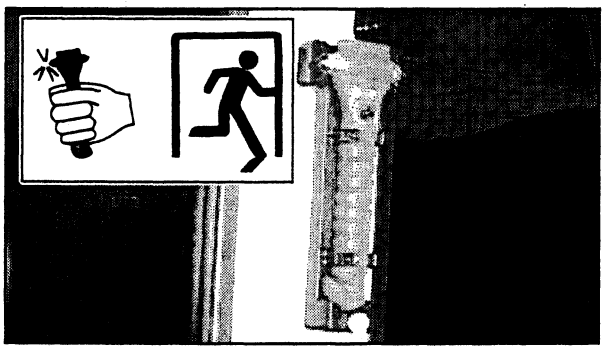
READ MANUAL / KEEP IN MACHINE CAB

C READ AND UNDERSTAND THE OPERATOR'S MANUAL

Before operating the machine, read and understand this operator's manual thoroughly in order to use the machine effectively and safely

D KEEP OPERATOR'S MANUAL IN MACHINE CAB

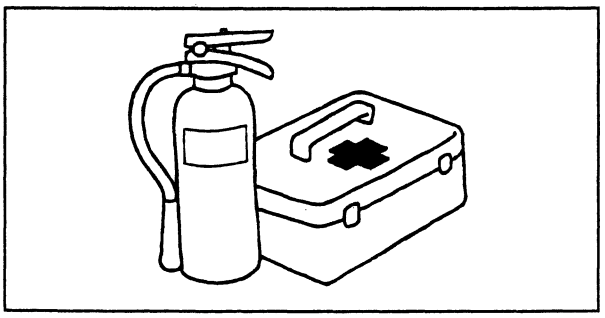
Keep this manual in the specified storage area located behind the operator's seat for quick reference Should the operators manual become lost or damaged, contact an authorized KOBELCO distributor to order the operator's manual



HOW TO HANDLE LIFE HAMMER

E HOW TO HANDLE LIFE HAMMER

A life hammer is provided on the left side of cab In case of emergency, take the life hammer, break the cab glass, and escape from the cab In addition, the life hammer is equipped with a cutter on the lever side to cut the seat belt, etc

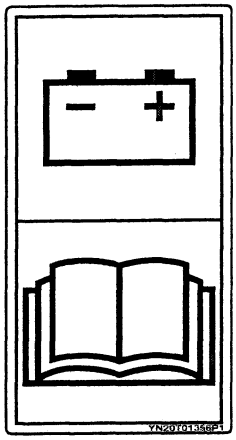


PREPARE FOR EMERGENCIES

F PREPARE FOR EMERGENCIES

Have a fire extinguisher and first aid kit ready for emergencies Know how to operate the fire extinguisher and know where the first aid kit is located for easy access in case of emergency

6 HANDLING BATTERY–DANGER AND WARNING
Located on battery box access cover
Part Number – YN20T01356P1



⚠ WARNING

AVOID ACID BURNS
- **Electrolyte is an acid and can cause injury or blindness if it contacts with skin or eyes**
- **Wear eye protection and protective clothing when handling or servicing batteries**
- **If electrolyte contacts skin or eyes, flush affected areas immediately with clean water and seek medical attention**

⚠ DANGER EXPLOSIVE GASES
Cigarettes flames or sparks could cause battery to explode Always shield eyes and face from battery. Do not charge or use booster cables or adjust post connections without proper instruction and training

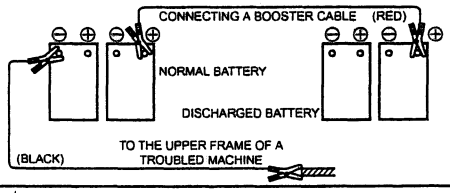
KEEP VENT CAPS TIGHT AND LEVEL
POISON CAUSES SEVERE BURNS
Contains sulfuric acid Avoid contact with skin eyes or clothing In event of accident flush with water and call a physician immediately.
KEEP OUT OF REACH OF CHILDREN

⚠ WARNING

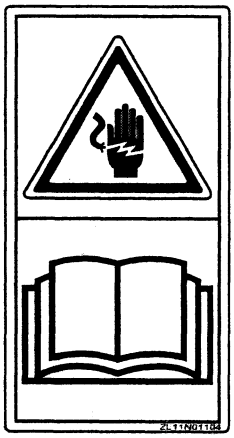
PREVENT BATTERY EXPLOSION
- **Batteries give off hydrogen gasses that can explode and cause personal injury.**
- **Keep sparks, open flames and cigarettes away from batteries**
- **Keep metallic articles away from batteries**
- **Keep all ventilation caps tightly secured**
- **Never check charge by placing metal articles across battery terminals**
- **Leave battery box open to improve ventilation when charging**

⚠ WARNING

Improper booster cable connections can cause an explosion resulting in personal injury
Connect booster cables using following procedure
1. **Connect booster cable to positive (+) battery terminal of discharged battery Connect other end of booster cable to positive battery terminal of normal battery**
2. **Connect other booster cable to negative (–) battery terminal of normal battery Connect other end of booster cable to upper frame of troubled machine**
3. **Start engine and remove booster cables in reverse order**



7 BOOSTER CABLE–WARNING
Located on battery box access cover
Part Number – ZL11N01104



⚠ WARNING

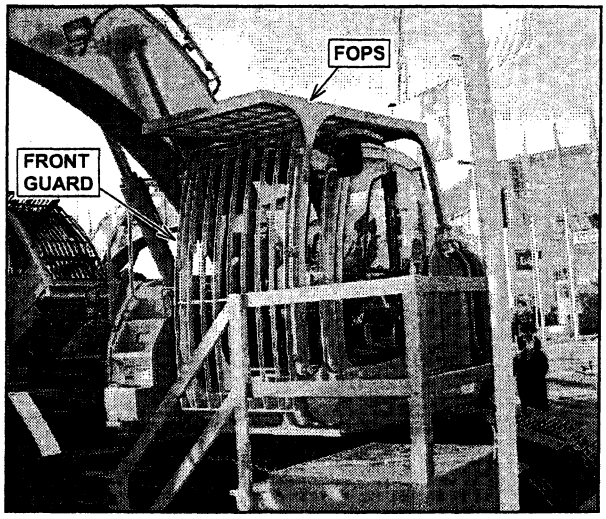
Electric hazard may cause injury when mishandling the cable
Read operator manual for safe and proper handling

1 11 USE FOPS AND FRONT GUARD

For some jobs (e g demolition), a safety structure (e g FOPS, Front guard) is needed When your machine does not have this safety structure, you are not allowed to use your machine for this kind of application

Please check your local dealer in case of doubt

FOPS Falling Object Protective Structure



USE FOPS AND FRONT GUARD

1 12 USE SAFETY VALVE AND OVERLOAD ALARM

If your machine is used for lifting application and has a maximum rated lifting capacity bigger than 1 ton or an overturning moment bigger than 40,000 Nm your machine needs safety valves and an overload alarm according to the EN 474 standard

Please check your local dealer in case of doubt

I Control Panel Description

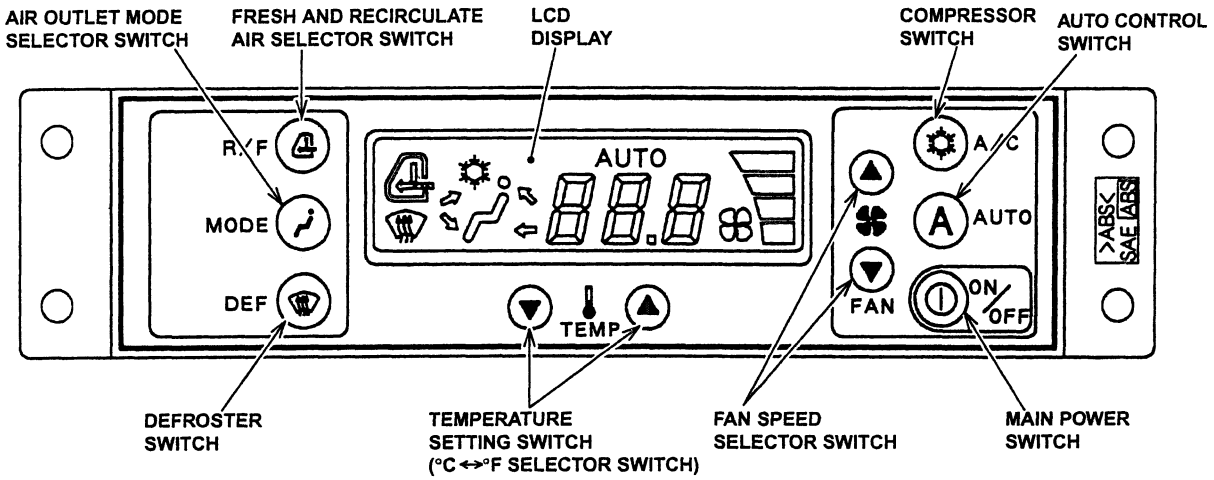


FIGURE 2 15

SUPPLEMENTARY EXPLANATION

The LCD display indicates temperature, air outlet mode, compressor ON - OFF, AUTO, recirculate and fresh air and fan speed

Each switch, FAN mark of blower, and TEMP mark are illuminated green at night

II Fundamental use – FIGURE 2 16

Before turning air-conditioner on, close doors of cab and windows to achieve the best performance

1 Press control switch "AUTO" to control air capacity and blower outlet automatically, and set the temperature in the range from 18 5°C (65 3°F) to 31 5°C (88 7°F)
The outlet temperature, outlet opening and fan speed are adjusted automatically so that indoor temperature of cab comes closer to the set temperature

2 Select proper mode manually through recirculate and fresh air capacity selector switch and compressor switch ON - OFF

3 Select preferable fan speed manually through fan speed selector switch when fan speed, selected through auto control, is not preferable
The indicator lamp of "AUTO" in LCD display goes out Press "AUTO" switch to return to automatic climate control

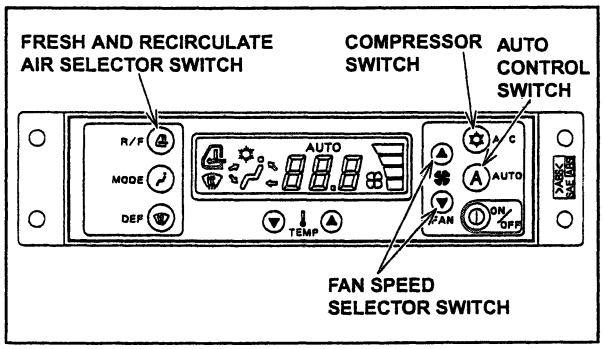


FIGURE 2 16

E GAUGE CLUSTER

The monitor displays information sent from sensors positioned at various places on the excavator, making it possible to monitor the excavator's operating working conditions

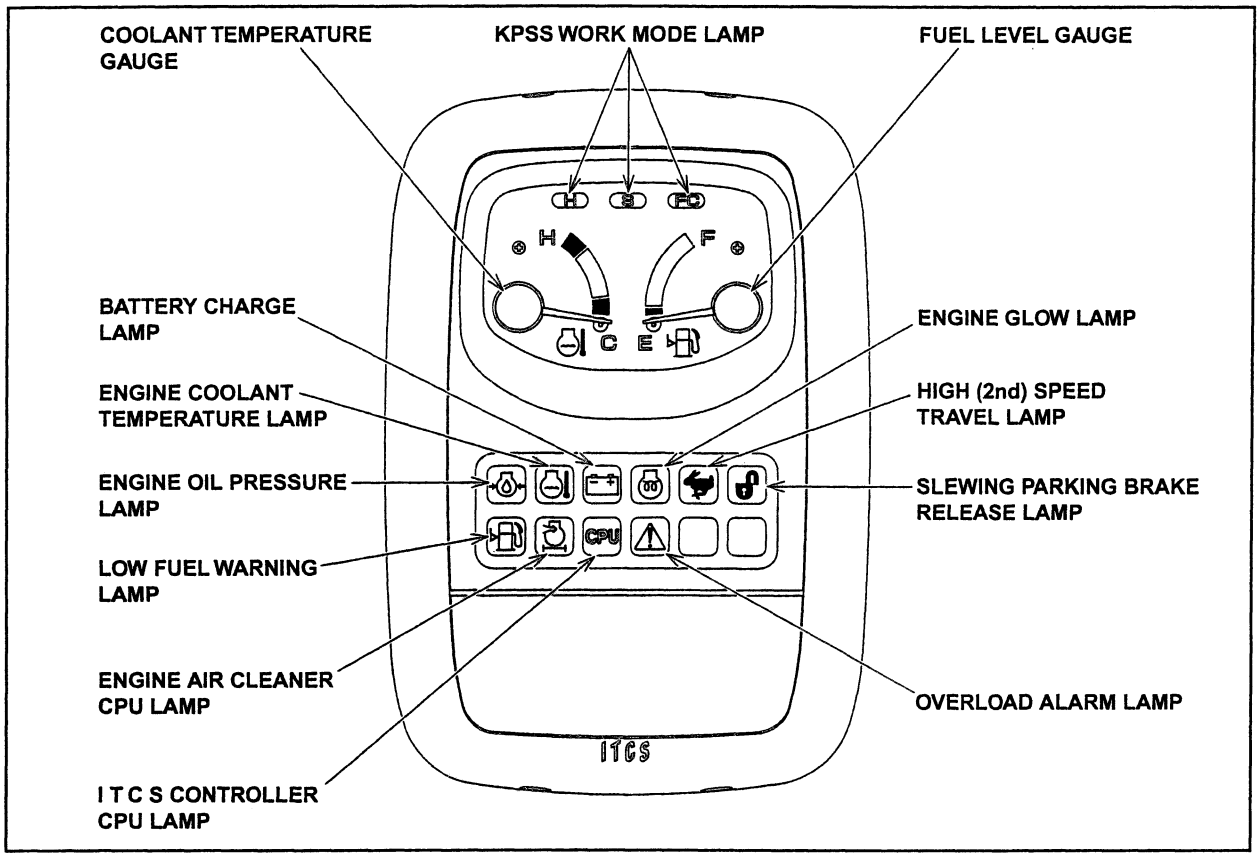
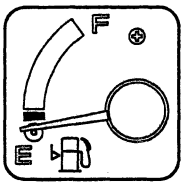


FIGURE 2 38

1 Fuel Level Gauge

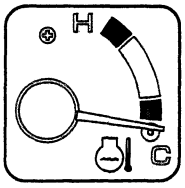


This indicates the amount of remaining fuel

F Fuel tank is about 100 Liter (26 gal)

E The remaining fuel oil is about 17 Liter (4 gal)

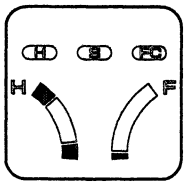
2 Water Temperature Gauge



This indicates the temperature of the engine coolant, and operates when the starter switch is turned to the "ON" position

The temperature is normal in the white range If the needle enters the red range, let the engine idle until the water cools down and the needle moves back into the white range

3 KPSS Work Mode Lamp



Press any of work mode selector switches (H), (S), (FC) on switch panel, and the selected work mode indicator is displayed in green

Machine is usually in S mode after starting engine

SUPPLEMENTARY EXPLANATION

- For guideline of work mode selector switch, see pages 2-3 and 3-8
- North and South American models are designed to be in H mode after the start-up, and the others are S mode start-up

B KPSS (KOBELCO POWER SENSING SYSTEM) MODE SWITCH

Before selecting a machine work mode, the operator should always study each job site to answer some basic questions

1 Is the machine capable of performing the particular job?

2 What attachment (bucket) is best suited for the job?

3 What type of material will the machine be excavating?

4 What operating mode is best suited for the job?

1 KPSS WORK MODE FUNCTIONS - FIGURE 3 21

The KPSS work mode switch allows the operation select and control the operation of the machine and the attachment effectively for a particular job by selecting one of three positions

a **"H" Mode** Provides maximum speed and power for digging operations

b **"S" Mode** Provides standard power and best fuel consumption

c **"FC" Mode** Allows fine control of hydraulic functions for attachment

Select the KPSS work mode best suited for the particular job at hand

2 KPSS WORK MODE SELECTION TABLE

The KPSS work mode selection table gives examples of work types, work requirements and materials being excavated Use this table when deciding the KPSS work mode best suited for the specific job at hand

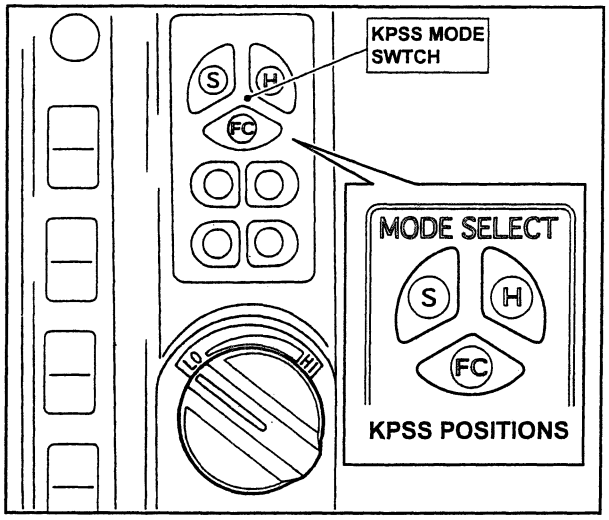


FIGURE 3 21

SUPPLEMENTARY EXPLANATION

North and south american models are designed to be in H mode after the start-up, and the others are S mode start-up

KPSS WORK MODE SELECTION TABLE

WORK TYPE	DIGGING			LOADING			CORRECTION			REFILLING & CORRECTION			CRUSHING			TRANSFER		
WORK REQUIREMENTS / MATERIAL	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
SOFT VISCOUS SOIL	H	S	FC	H	S	FC	FC	FC	FC	H	S	FC				Flat Land "S"		
LOOSE SANDY SOIL	H	S	FC	H	S	FC	FC	FC	FC	H	S	FC				Slope & Long Distance Travel "H"		
TIGHT SANDY SOIL	H	S	FC	H	S	FC	S	FC	FC					H				
GRAVEL & STONE	H	H	S	H	H	S	S	S	FC									
TIGHT GRAVEL/MIXED SOIL	H	H	S	H	H	S	H	H	S							Loading & Unloading etc "FC"		
SOFT STONE	H	H	H	H	H	H	H	H	H									

Work Requirements – 1=large volumes at fast speed • 2=normal work, less fuel • 3=fine control of attachment

E Cleaning Sand & Soil from Bucket – FIGURE 3 44
Operate arm to a near level position and bring the bucket to a dumping position If sand and soil do not fall out, move the bucket lever right and left a few times

CAUTION

Avoid shaking out soil using shocks at the end of the bucket cylinder stroke

F Stop Slewing Motion Early – FIGURE 3 45
To stop slewing action, release the slewing lever before you get to your final point of digging or dumping

G Back Filling & Leveling – FIGURE 3 46
For back filling and leveling work after digging, move the bucket back and forth horizontally

NOTE

Do not push or pull material with the bucket like a bulldozer when using the machine to level material

1 In leveling ground toward machine, pull the arm gently, lift the boom a little and when the arm has passed the vertical point, lower the boom gently and manipulate the machine so the bucket moves horizontally

2 For leveling ground away from machine, reverse operation in step 1 above

3 In the above operation, bucket motion may be used together with the boom By controlling the action of the boom work lever, you can dig a slope- like, slope facing operation

4 Never travel with attachment touching the ground Severe structural damage could occur

H Operating the Shovel – FIGURE 3 46A
Digging with the shovel differs slightly from digging with backhoe

1 Using the arm cylinder, scrape the ground

2 Scrape the ground at 2 ~ 3° to improve draining in areas near the groundwater level

3 Be careful not to bump the reversed bucket into the cab

4 The excavating power during shovel operations is less than that during backhoe operations

5 If machine bucket is equipped with a lifting eye, check to make sure that the eye will clear arm with bucket cylinder in full extended (full dump) position

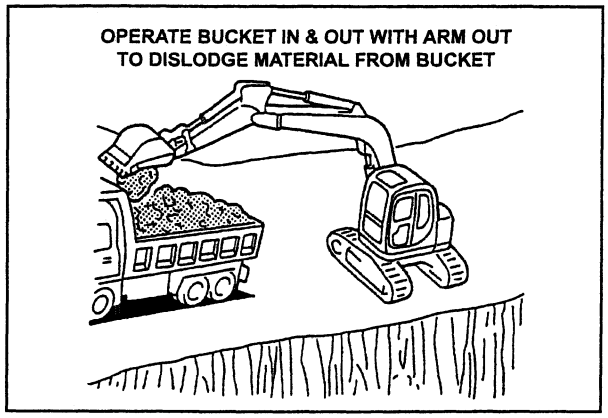


FIGURE 3 44

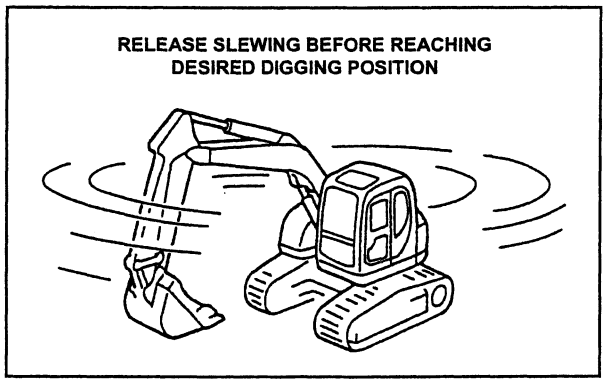


FIGURE 3 45

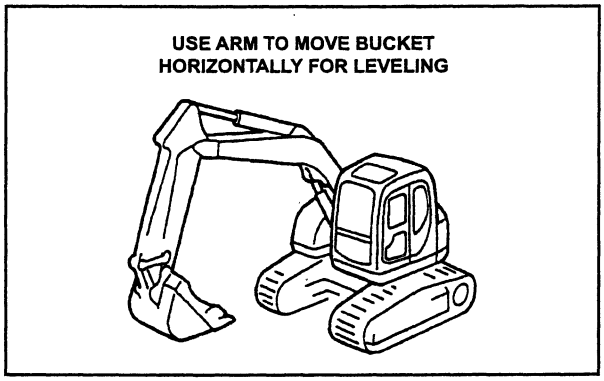


FIGURE 3 46

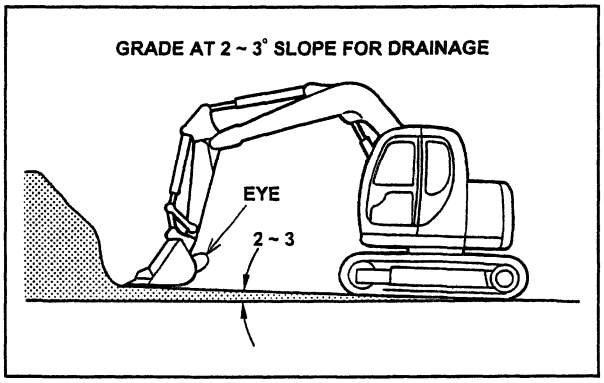


FIGURE 3 46A

4 Do not enter such hot places as an open-air fire, steel plate left in the sunshine
Do not work for asphalt leveling See Figure 3 70

5 When storing the machine for long period (more than three months) , keep it indoors which will not be exposed to direct sunshine and rain

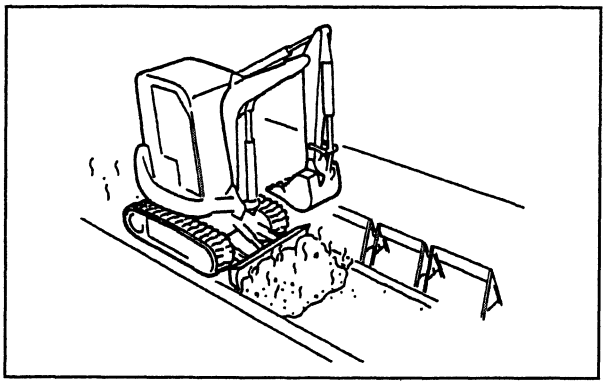


FIGURE 3 70

6 If the machine travel using one side crawler, with the crawler of another side floating, the rubber crawler shoe may come off from the rollers or be damaged See Figure 3 71

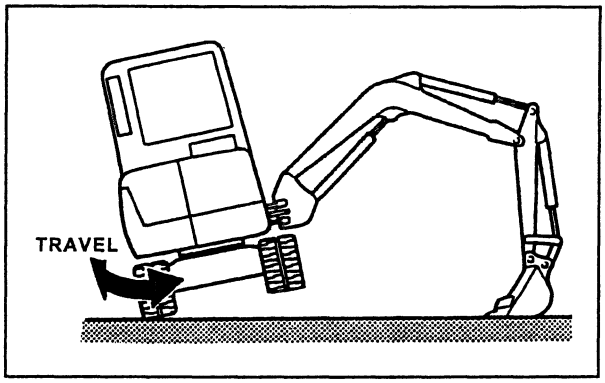


FIGURE 3 71

C CAUTIONS ON USE – FIGURE 3 72 & FIGURE 3 73
Use care of the following when working

1 **Rubber shoes slip easily on icy surfaces**
Take the necessary safety precautions, such as not driving on snowy/icy slopes

2 Avoid making a spin turn on a concrete road

3 Avoid abrupt change of directions as such will cause early wear or chipping of the rubber crawler shoe

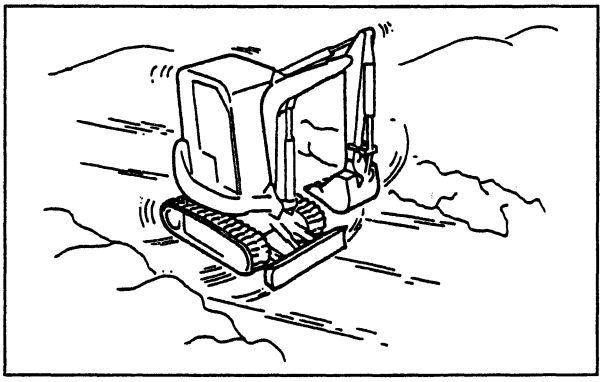


FIGURE 3 72

4 Exercise care so the rubber crawler shoe is not damaged by the bucket while working

5 Do not operate the machine by pressing the bucket against concretes and walls

6 When the machine is lifted up by the attachment, lower it slowly

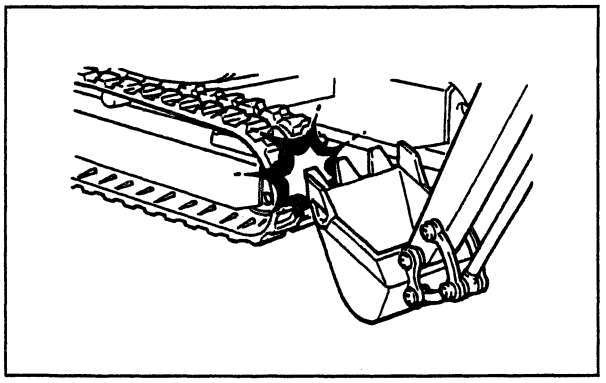


FIGURE 3 73

D LUBRICANT SPECIFICATIONS

The following information is designed to allow usage of the proper oils, greases, fuels and coolants in various climates and certain working conditions

LUBRICANT	CLIMATE ZONE				
HYDRAULIC OIL (ANTI-WEAR, ANTIOXIDANT AND NON-FOAMING) *Note Machines are shipped from factory with SHELL TELLUS 32S hydraulic oil	FRIGID -30°C ~ 15°C (-22 F ~ 59°F) ISO VG22	FRIGID -20 C ~ 30 C (-4 F ~ 86°F) ISO VG32	FRIGID ~ WARM -25°C ~ 40 C (-13 F ~ 104 F) ISO VG32S*	WARM -5 C ~ 40 C (23°F ~ 104 F) ISO VG46	VERY HOT 5 C ~ 55°C (41°F ~ 131 F) ISO VG68

LUBRICANT	CLIMATE ZONE		
ENGINE OIL* A P.I CLASSIFICATION FOR "SERVICE CD" *ALL ENGINES SHIPPED FROM FACTORY WITH SAE30 OR SAE15W40 OIL ACCORDING TO AMBIENT TEMPERATURE IN ENGINE OIL PAN	FRIGID -30 C ~ 30°C (-22°F ~ 86°F) SAE10W30	WARM -5°C ~ 40 C (23 F ~ 104°F) SAE15W40	VERY HOT 30°C and Above (86°F and Above) SAE15W50

LUBRICANT	CLIMATE ZONE		
FUEL	FRIGID -15 F ~ -25°C (5°F ~ -13°F) WINTERIZED ASTM D975 No.1	WARM -5°C ~ -15°C (23°F ~ 5 F) ASTM D975 No.2	VERY HOT -5°C and Above (23°F and Above) ASTM D975 No.2

LUBRICANT	
ENGINE OIL (FOR GENERAL PURPOSE LUBRICATION)	FOR ROLLERS AND IDLERS ON ALL MODELS A P.I Classification for "Service CD"–SAE30

LUBRICANT	
GEAR OIL	FOR SLEWING MOTOR REDUCTION UNIT AND TRAVEL MOTOR REDUCTION UNITS ON THE FOLLOWING MODELS SK80MSR 1E EXTREME PRESSURE GEAR OIL #90 GRADE GL-4 BY A P.I CLASSIFICATION

LUBRICANT	GENERAL LUBRICATION	SLEWING GEAR SUMP (BATH)
GREASE	EXTREME PRESSURE MULTIPURPOSE GREASE No 2 EP TYPE GREASE	N L G I No 2 LITHIUM BASE WITH MoS_2 GREASE

LUBRICANT	
ENGINE COOLANT (50% MIXTURE)-EU (30% MIXTURE)-OCEANIA	ANTIFREEZE (LLC) -34°C (-29 2°F) MIXTURE RATIO SHOULD PROSPECT TO 5 C (9°F) LOWER THAN THE COLDEST TEMPERATURE THE MACHINE WILL EXPERIENCE TAKE INTO CONSIDERATION WIND CHILL FACTORS

NOTE: USE OF BIO-DEGRADABLE OILS

When you use Bio-degradable Oil (BIO OIL), refer to the following information

1 There are two types of BIO OIL available, vegetable-based and synthetic-based You are recommended to use the synthetic-based type, because the vegetable-based oil has a maximum usage temperature of 80°C (176 F) Because of this, the degradation of vegetable-based oil occurs more rapidly, and caused reduced service life

2 Do not mix either type of BIO OIL with the original factory-filled mineral oil The hydraulic system has to be flushed three times if you want to use BIO OIL instead of the factory-filled mineral oil

3 If you use BIO OIL, slewing and propel parking brake performance will be reduced, because of the lower friction factor of BIO OIL compared to that of mineral oil

4 For further information about recommended Bio-degradable oil, please contact KOBELCO distributor

2 Track links

a Inspect links for signs of excessive wear or damage See Figure 4 43

b Have all repair or replacement work done by KOBELCO distributor

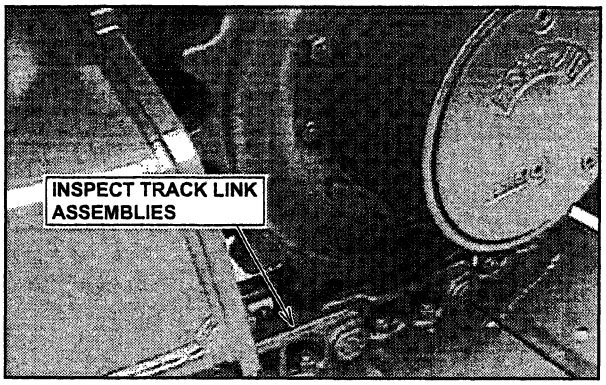


FIGURE 4 43

3 Sprockets

a Inspect sprockets for excessive wear and damage See Figure 4 44

b Should the sprockets require service, contact KOBELCO distributor

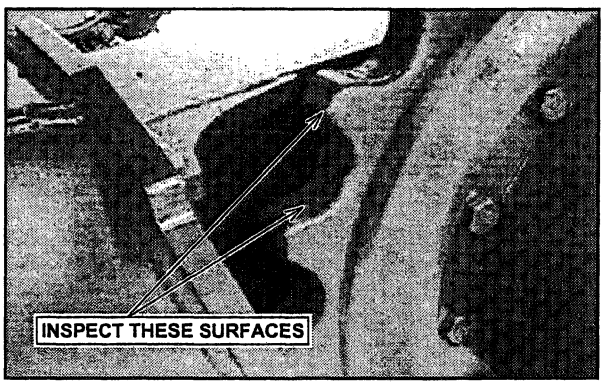


FIGURE 4 44

4 Idlers

a Inspect idlers for excessive wear and damage See Figure 4 45

b Should the idlers require service, contact KOBELCO distributor

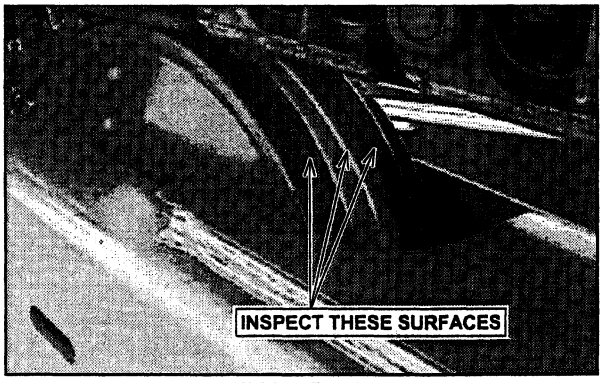


FIGURE 4 45

5 Rollers

a Inspect rollers for excessive wear and damage See Figure 4 46

b Should the rollers require service, contact KOBELCO distributor

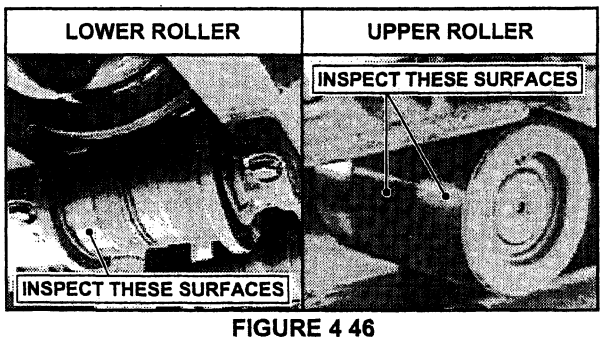


FIGURE 4 46

4 7 100 HOUR (MONTHLY) INSPECTION & MAINTENANCE PROCEDURES

NOTE

Perform all pre-start (Every 8 hour and 50 hour) inspection & maintenance procedures along with the following 100 hour inspection and maintenance procedures

A ATTACHMENT LUBRICATION

Use extreme pressure multi-purpose grease No 2 EP type grease Lubricate all points until grease purges

NOTE

If attachment is sank in water, it is recommended to lubricate it every 8 hours

1 Idler link and bucket pin (1) See Figure 4 72

2 Bucket cylinder rod end (2) See Figure 4 72

3 Arm top pin (3) See Figure 4 72

4 Bucket kink pins (4) See Figure 4 72

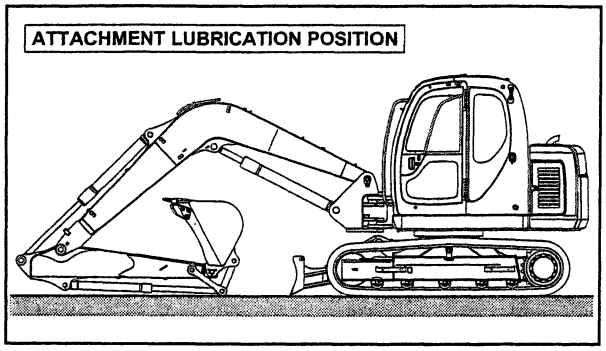


FIGURE 4 71

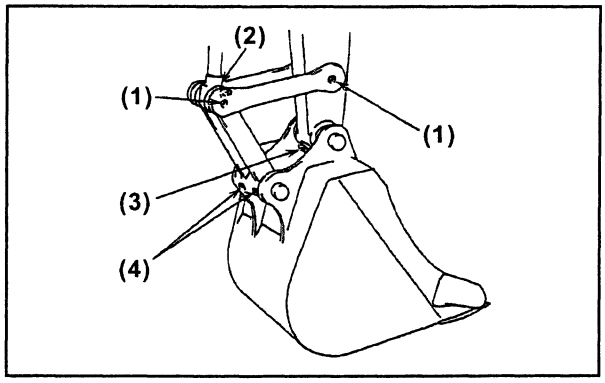


FIGURE 4 72

B DOZER BLADE LUBRICATION – FIGURE 4 73

Lubricate dozer blade pins every 100 hours of engine operation Use extreme pressure multipurpose No 2 EP type grease Lubricate all points until grease purges

1 Dozer cylinder rod and head (1)

2 Dozer blade link pin (2)

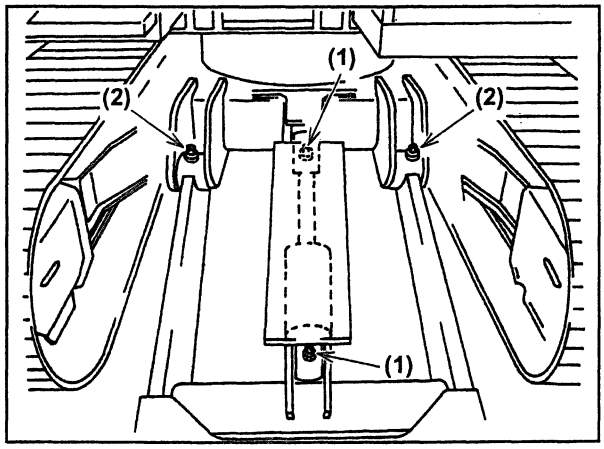


FIGURE 4 73

H CHECKING THE AIR CONDITIONER REFRIGERANT

1 Start the engine Set the engine speed to the middle speed position

2 Set the machine to the conditions shown below when checking the refrigerant See Figure 4 98

- Air conditioner switch ON
- Fan switch HI position (Maximum ▲)
- Temp adjustment switch Lower temp position (▼)
- Door / Window Close
- Compressor switch ON (The ⚙ lamp lit up)

2 Follow the procedure below and check the refrigerant volume by looking through the sight glass (inspection window) on the upper part of the receiver dryer See right table for better reference

a Figure (A) shows that the refrigerant volume is proper

b Figure (B) shows that the refrigerant is over charged This will make both high and low pressure extreme and exert a bad influence on the pressure switch operation and the air conditioning system

c Figure (C) shows that the refrigerant is insufficient Have the refrigerant recharged at your KOBELCO distributor

NOTE

- New refrigerant (HFC-R134a), whose characteristics are different from conventional CFC-12, is used in this machine Do not mix HFC-R134a with CFC-12
- Keep the air conditioner ready for use all year round Operate the air conditioner at least once every week for several minutes to rotate the compressor regardless of the season This will prevent the refrigerant gas from leaking from the compressor sealing

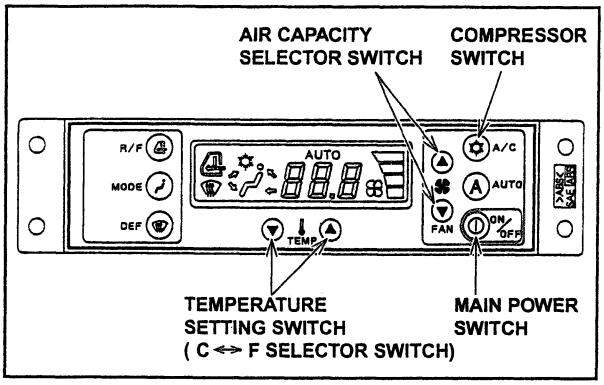


FIGURE 4 98

Refrigerant volume	Description
(A) Proper ○	After the air conditioner is turned ON, little bubbles appear. The refrigerant becomes transparent, then turns a light milky white.
(B) Overcharged ✕	After the air conditioner is turned ON, no bubbles appear.
(C) Insufficient ✕	After the air conditioner is turned ON, bubbles appear continuously.

Bubbles : Refrigerant gas is mixed with refrigerant fluid

No Bubbles : Whole refrigerant becomes fluid and transparent

Cloudy : Refrigerant is separated from oil The fluid becomes a light milky white

2 Reversing Backhoe Bucket

a Move the machine to a firm, level surface and rest the bucket on the ground, making certain the bucket is stable See Figure 4 124

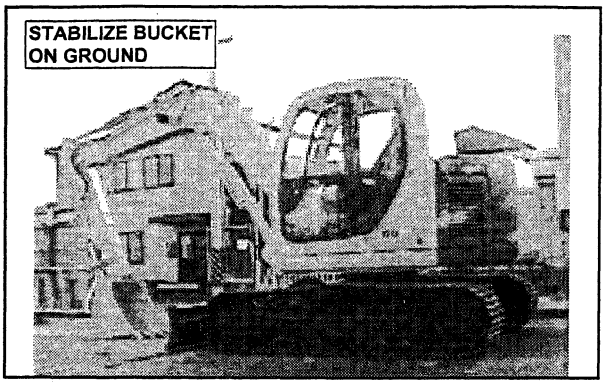


FIGURE 4 124

b Remove flexible ring (1) and pin, and also remove bucket pin and link pin See Figure 4 125

c Clean pins and pin hole, and apply grease on it

d Carefully remove main pins attching arm and bucket link to bucket

e Rotate bucket 180° or move machine, install arm and bucket link in their respective positions See Figure 4 126

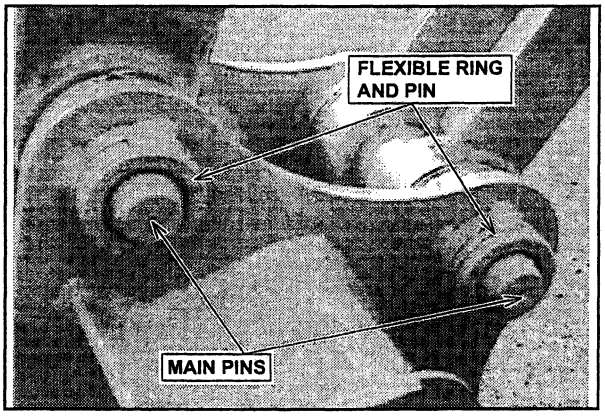


FIGURE 4 125

NOTE

Make certain "O"-rings are on bucket boss for reinstallation

f Roll "O"-rings into grooves between bucket / arm and bucket / bucket link

g Align each pin holes, insert bucket pin, and fit flexible ring and pin

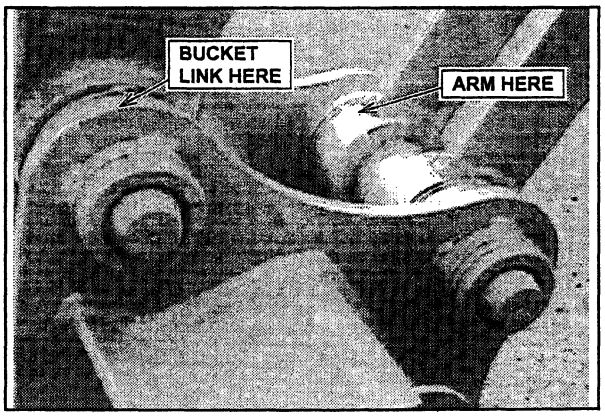


FIGURE 4 126

NOTE

Inspect "O"-rings for damage or excessive wear If worn or damaged replace with new parts to protect seals, pins and surfaces from dirt and debris which can cause premature failure

"O"-ring part number (4 Required) 2445Z912

6 3 TORQUE SPECIFICATIONS

The following torque specifications are provided for use when actual torque value of a fastener is not known

A CAPSCREWS & NUTS

1 Metric coarse thread standard tightening torque values Make certain to tighten all capscrews & nuts to proper torque values

Torque value unit - kgf·m (lbf ft)

Classification	4 8 T		7 T		10 9 T	
NOMINAL SIZE	NO LUBRICATION	OIL LUBRICATION	NO LUBRICATION	OIL LUBRICATION	NO LUBRICATION	OIL LUBRICATION
M6 P=1	0 45 ± 0 05 (3 2 ± 0 4)	0 38 ± 0 04 (2 7 ± 0 3)	0 98 ± 0 1 (7 1 ± 0 7)	0 83 ± 0 08 (6 0 ± 0 6)	1 77 ± 0 18 (12 8 ± 1 3)	1 5 ± 0 15 (10 8 ± 1 1)
M8 P=1 25	1 09 ± 0 11 (7 9 ± 0 8)	0 92 ± 0 09 (6 6 ± 0 7)	2 4 ± 0 2 (17 3 ± 1 4)	2 0 ± 0 2 (14 4 ± 1 4)	4 3 ± 0 4 (31 0 ± 2 9)	3 6 ± 0 4 (26 0 ± 2 9)
M10 P=1 5	2 2 ± 0 2 (15 9 ± 1 4)	1 83 ± 0 18 (13 2 ± 1 3)	4 7 ± 0 5 (33 9 ± 3 6)	4 0 ± 0 4 (28 9 ± 2 9)	8 5 ± 0 9 (61 3 ± 6 5)	7 2 ± 0 7 (52 0 ± 5 1)
M12 P=1 75	3 7 ± 0 4 (26 7 ± 2 9)	3 2 ± 0 3 (23 1 ± 2 2)	8 1 ± 0 8 (58 5 ± 5 8)	6 8 ± 0 7 (49 1 ± 5 1)	14 6 ± 1 5 (105 ± 10 8)	12 3 ± 1 2 (88 8 ± 8 7)
M14 P=2	5 9 ± 0 6 (42 6 ± 4 3)	5 0 ± 0 5 (36 1 ± 3 6)	12 8 ± 1 3 (92 5 ± 9 4)	10 8 ± 1 1 (78 0 ± 7 9)	23 ± 2 (166 ± 14)	19 5 ± 1 9 (140 ± 14)
M16 P=2	9 0 ± 0 9 (64 9 ± 6 5)	7 6 ± 0 7 (54.8 ± 5 1)	19 5 ± 2 0 (140 ± 14 4)	16 4 ± 1 6 (118 ± 11 5)	35 ± 4 (252 ± 28 9)	29 ± 3 (209 ± 21 6)
M18 P=2 5	12 4 ± 1 2 (89 6 ± 8 7)	10 5 ± 1 0 (75 8 ± 7 2)	27 ± 3 (195 ± 22)	23 ± 2 (166 ± 14)	49 ± 5 (354 ± 36)	41 ± 4 (296 ± 29)
M20 P=2 5	17 5 ± 1 7 (126 ± 12 3)	14 7 ± 1 4 (106 ± 10 1)	38 ± 4 (274 ± 29)	32 ± 3 (231 ± 22)	68 ± 7 (491 ± 51)	57 ± 6 (412 ± 43)
M22 P=2 5	23 ± 2 (166 ± 14)	19 6 ± 2 0 (142 ± 14)	51 ± 5 (368 ± 36)	43 ± 4 (310 ± 29)	92 ± 9 (663 ± 65)	77 ± 7 (555 ± 58)
M24 P=3	30 ± 3 (217 ± 22)	24 ± 3 (173 ± 22)	65 ± 7 (469 ± 51)	53 ± 5 (383 ± 36)	118 ± 12 (852 ± 87)	96 ± 10 (693 ± 72)
M27 P=3	44 ± 4 (318 ± 29)	36 ± 3 (260 ± 22)	96 ± 10 (693 ± 72)	78 ± 8 (563 ± 58)	173 ± 17 (1250 ± 120)	140 ± 14 (1010 ± 100)
M30 P=3 5	60 ± 6 (433 ± 43)	50 ± 5 (361 ± 36)	131 ± 13 (946 ± 94)	110 ± 11 (794 ± 79)	235 ± 24 (1700 ± 170)	198 ± 20 (1430 ± 140)
M33 P=3 5	81 ± 8 (585 ± 58)	68 ± 7 (491 ± 51)	176 ± 18 (1270 ± 130)	148 ± 15 (1070 ± 110)	317 ± 32 (2290 ± 200)	266 ± 27 (1920 ± 200)
M36 P=4	105 ± 10 (758 ± 72)	88 ± 9 (636 ± 65)	227 ± 23 (1640 ± 170)	190 ± 19 (1370 ± 140)	409 ± 41 (2960 ± 300)	343 ± 34 (2480 ± 250)

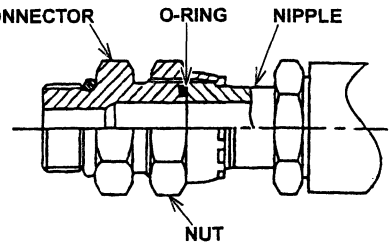
2 Metric fine thread standard tightening torque values Make certain to tighten all capscrews & nuts to proper torque values

Torque value unit - kgf·m (lbf ft)

Classification	4 8 T		7 T		10 9 T	
NOMINAL SIZE	NO LUBRICATION	OIL LUBRICATION	NO LUBRICATION	OIL LUBRICATION	NO LUBRICATION	OIL LUBRICATION
M8 P=1 0	1 15 ± 0 11 (8 3 ± 0 8)	0 97 ± 0 1 (7 0 ± 0 7)	2 5 ± 0 2 (18 0 ± 1 4)	2 1 ± 0 2 (15 2 ± 1 4)	4 5 ± 0 4 (32 5 ± 2 9)	3 8 ± 0 4 (27 4 ± 2 9)
M10 P=1 25	2 3 ± 0 2 (16 6 ± 1 4)	1 91 ± 0 19 (13 8 ± 1 4)	4 9 ± 0 5 (35 4 ± 3 6)	4 2 ± 0 4 (30 3 ± 2 9)	8 9 ± 0.9 (64 2 ± 6 5)	7 5 ± 0 7 (54 2 ± 5 1)
M12 P=1 25	4 0 ± 0 4 (28 9 ± 2 9)	3 4 ± 0 3 (24 5 ± 2 2)	8 7 ± 0 9 (62 8 ± 6 5)	7 3 ± 0 7 (52 7 ± 5 1)	15 7 ± 1 6 (113 ± 13)	13 2 ± 1 3 (95 3 ± 9 4)
M16 P=1 5	9 4 ± 0 9 (67 9 ± 6 5)	7 9 ± 0 8 (57 0 ± 5 8)	20 ± 2 (144 ± 14)	17 2 ± 1 7 (124 ± 12)	37 ± 4 (267 ± 29)	31 ± 3 (224 ± 22)
M20 P=1 5	19 ± 9 (137 ± 14)	15 8 ± 1 6 (114 ± 14)	41 ± 4 (296 ± 29)	34 ± 3 (246 ± 22)	74 ± 7 (535 ± 51)	62 ± 6 (448 ± 43)
M24 P=2	32 ± 3 (231 ± 22)	27 ± 3 (195 ± 22)	70 ± 7 (506 ± 51)	58 ± 6 (419 ± 43)	126 ± 12 (910 ± 87)	105 ± 10 (758 ± 72)
M30 P=2	65 ± 6 (469 ± 43)	54 ± 5 (390 ± 36)	142 ± 14 (1030 ± 100)	118 ± 12 (852 ± 87)	255 ± 26 (1840 ± 190)	212 ± 21 (1530 ± 150)
M36 P=3	109 ± 11 (787 ± 79)	91 ± 9 (657 ± 65)	238 ± 23 (1720 ± 170)	198 ± 20 (1430 ± 140)	428 ± 43 (3090 ± 310)	357 ± 36 (2580 ± 260)

B ORS JOINT (O-RING SEALING TYPE)

	NOMINAL SIZE	OPPOSING FLATS mm	TORQUE VALUE kgf m (lbf ft)	WORKING PRESSURE kgf/cm² (psi)
HOSE MOUTH RING AND COUPLING	1-14 UNS	30 32	14 ± 1 4 (101 ± 10)	350 (4980)
	1-3/16 12 UN	36 41	18 ± 1.8 (130 ± 13)	
	1-7/16 12UN	41 46	21 ± 2.1 (152 ± 15)	



Section IX – SPECIAL PROCEDURES

9 1 GENERAL

The SK80MSR-1E machine incorporates automatically applied spring brake systems in the travel motors and slewing motors These systems will automatically engage the brakes when engine is stopped making it impossible to move the machine This section contains the required procedures for releasing the travel motor brakes, the slewing motor brake and lowering the attachment to the ground should sudden engine failure be experienced

⚠ WARNING ⚠

READ, UNDERSTAND AND FOLLOW ALL SAFETY PRECAUTIONS AND PROCEDURES FOUND IN THIS MANUAL BEFORE ATTEMPTING ANY OPERATION, INSPECTION, MAINTENANCE OR REPAIR OF THIS MACHINE, ATTACHMENT OR ANY OF ITS SYSTEMS

⚠ WARNING ⚠

THE PROCEDURES FOUND IN THIS SECTION SHOULD BE PERFORMED BY A WELL TRAINED EXPERIENCED SERVICE TECHNICIAN WHO IS FAMILIAR WITH THE KOBELCO SK80MSR-1E MACHINES

9 2 RELEASING TRAVEL MOTOR BRAKES

A TOOLS & EQUIPMENT REQUIRED

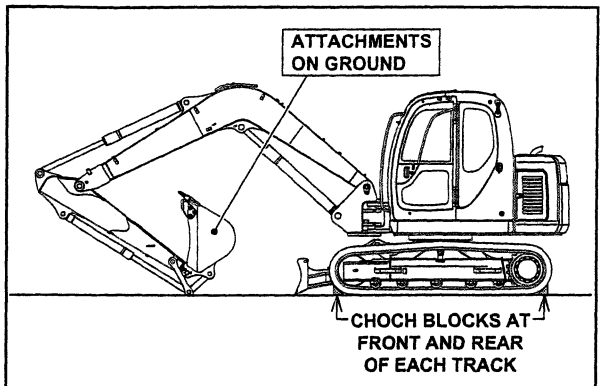
1 Four chock blocks
2 One allen wrench for drain plug
3 Hammer and punch one each
4 Drilling device for 2 mm diameter
5 Two 3 4 Liter (0.9 Gal) capacity drain pans
6 Thread sealant (For drain and check / fill plugs)
7 Rubber or soft faced mallet

B PROCEDURES

NOTE

Make sure to align the plugs on the travel motor covers perpendicular to the ground, as shown on Figure 9 3, before shutting off the engine

1 Place chock blocks at front and rear of each track to prevent machine from moving when brakes are released See Figure 9 1



⚠ WARNING ⚠

MAKE CERTAIN CHOCK BLOCKS ARE SECURE AT FRONT AND REAR OF EACH TRACK BEFORE ATTEMPTING TO RELEASE BRAKES NEVER STAND IN THE PATH OF THE TRACKS WHEN RELEASING BRAKES

FIGURE 9 1

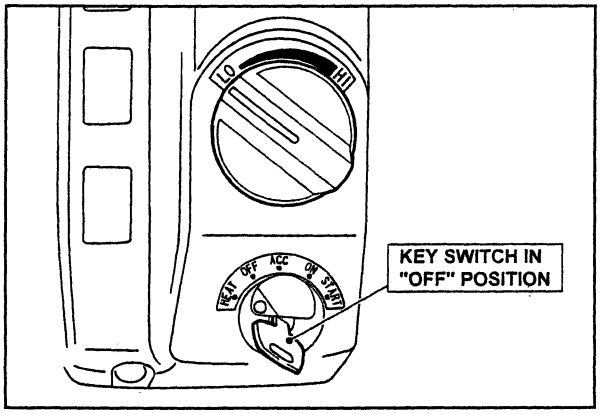


FIGURE 9 2

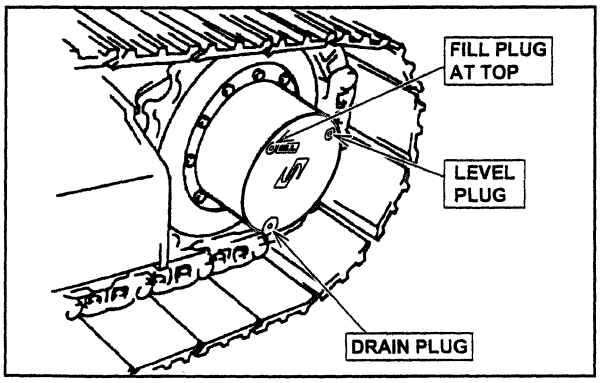


FIGURE 9 3