

Kobelco Dynamic Acera



Kobelco Construction Machinery America LLC Machine Familiarization

KOBELCO

Kobelco Construction
Machinery America LLC

DYNAMIC ACERA SERIAL NUMBER RANGE

SK160LC	YM02U0101 ~
ED190LC	YL02U0101 ~
SK210LC	YQ07U0101 ~
SK250LC	LL08U0101 ~
SK290LC	LB03U0101 ~
SK330LC	YC06U0101 ~
SK480LC	YS06U0101 ~

MINOR CHANGE SERIAL NUMBER RANGE

SK160LC	YM03U0522 ~
ED190LC	YL03U0136 ~
SK210LC	YQ08U0969 ~
SK250LC	LL09U0575 ~
SK290LC	LB04U0298 ~
SK330LC	YC07U0623 ~

Note: Minor Change information is designated in much of this manual with either the words “minor change or abbreviation “M/C”.



KOBELCO
Kobelco Construction
Machinery America LLC

KOBELCO**COMPACT, SR, & DYNAMIC ACERA PRE-DELIVERY INSPECTION**

Dealer Name	Dir. Code	Model No.	
Address		Serial No.	
City	State	Zip Code:	Hr. Meter

Engine Model	Engine S/N	Bkt. Mfg.	S/N
Attachment Type	Make	S/N	Arm Length
Arm Cyl. S/N	Bkt. Cyl. S/N	Boom Cyl. (L.H.) S/N	Boom Cyl. (R.H.) S/N

Place a **"C"** in the column if the item is **CORRECT**. Place a **"I"** in the column if the item is **INCORRECT**, and explain by item number under the comments section. Fill in the blanks provided beside each item.

	Visual Checks	C/I		Miscellaneous	C/I		Service Diagnostic Check	C/I
1	Appearance (Overall)		11	Basic Machine Operation Proper		40	Condition M/H- Mode	
	Good		12	Support Packages			* Display Number	
2	Glass			Manual Missing		* No. 1	Main Cont. P/No.	
	Dirty			Parts Missing			Program Version	
	Broken			Fluid Levels / Lubrication	C/I	* No. 2	Eng.Speed Rpm	
3	Paint Defects		13	Engine Oil Level			Low Idle (Set Val.)	rpm
	Cab		14	Engine Coolant °F			Low Idle (Meas. Val)	rpm
	Upper Frame		15	Engine Coolant level			High Idle (Set Val.)	rpm
	Lower Frame		16	Hydraulic Oil Level			High Idle (Meas. Val)	rpm
	Attachments		17	Swing Gear Bath			Auto Accel	rpm
	Counterweight		18	Swing Reduction Unit			A/S-Mode High Idle	rpm
4	Cab		19	Travel Reduction Unit - L.H			B/FC-Mode High Idle	rpm
	Appearance (Good)		20	Travel Reduction Unit - R.H		* No. 14	C-1 Pump P-1 w/H.L.	V
	Cab Mounting		21	Lubricate Attachments			C-1 Pump P-1 w/H.L.	K
	Instrument panels		22	Check Fuel Water Sep.			C-1 Pump P-1	V
	Seat assembly		23	Check Pilot Filter			C-1 Pump P-1	K
	Cab operation levers			Engine Checks	C/I		C-2 Pump P-2 w/H.L.	V
	Switches / Controls		24	Air Intake/Exhaust Connections			C-2 Pump P-2 w/H.L.	K
	Radio/Speakers			Loose/Misassemble - Connectors			C-2 Pump P-2.	V
	Air Cond. / Heating Unit			Leaking - Hoses/Tubes/Fittings			C-2 Pump P-2	K
	Gauge / Warning Lamps		25	Exhaust Connections			Cylinder Cycle Times, M/H-Mode	C/I
5	Decals			Loose/Misassemble - Connectors		41	Boom Cyl. - Out	Sec
	Misapplied / Damaged			Leaking - Hoses/Tubes/Fittings		42	Boom Cyl. - In	Sec
	Wrong/Missing Decal		26	Fuel System Connections		43	Arm Cyl. - Out	Sec
6	Hoses,Tubes, Fittings			Loose/Misassemble Connectors		44	Arm Cyl. - In	Sec
	Powertrain components			Hoses/Tube/Fitting Leaking		45	Bucket Cyl. - Out	Sec
	Upper - Loose/Routing		27	Oil & Fuel Filters		46	Bucket Cyl. - In	Sec
	Lower - Loose/Routing			Loose / Leaking			Swing System Performance	C/I
	Attach.- Loose/ Routing		28	Fan Belt Adjustment		47	Swing Speed - LH	Sec
7	All Bolts & Fasteners		29	Air Cleaner Elements		48	Swing Speed - RH	Sec
	Powertrain components			Missing			Electrical System	C/I
	Upper			Damaged		49	Work & Cab Lights	
	Lower			Hyd. System.Press. (SK70 ~330)	C/I		Inoperable	
	Attach.		30	Pilot System Pressure	psi	50	Swing Flashers	
8	Wiring Harness		31	Main Relief w/H.L. *	psi		Inoperable	
	Routing / Misassembly		32	Main Relief	psi	51	Horn	
	Connections loose		33	Dozer Main Relief *	psi		Inoperable	
9	Component Fluid Leakage		34	Swing Port Relief - L	psi	52	Pilot Lever Lock Switch	
	Engine Assembly		35	Swing Port Relief - R	psi		Inoperable	
	Hyd. Control Valve			(*) Note: If applicable for specific machine		53	Travel Alarm	
	Hyd. Main Pump			Hyd. System Press. (Compact Exc.)	C/I		Inoperable	
	Hyd. Travel Motor/Red.		36	P1 Main	psi	54	Battery	
	Hyd. Swing Motor/Red.		37	P2 Main	psi		Electrolyte Level	
10	Track Adjustment		38	P3 Main	psi		Charge (Low)	
	Proper Tension		39	P4 Main	psi			

Comments: (Please enter line item # and Description)

Completed By: _____ Completed Date: _____

Rev. # 2.0 Form# 00020MIVALL

Note: Please promptly submit this form to the Kobelco Service Department via mail or the Kobelco Internet System. For assistance please contact the Kobelco Service Dept.

SK160LC-VI - PERFORMANCE SPECIFICATIONS

The following performance specifications are based on the standard machine with standard attachment.

1. Travel Speed, Swing Speed & Gradeability

DESCRIPTION	SPECIFICATION
TRAVEL SPEED	6.0 km per hr (3.7 mph) in  mode. 4.0 km per hr (2.5 mph) in  mode.
SWING SPEED	11 RPM IN M-Mode / "HI" Idle.
GRADEABILITY	70% (35°) {Limited by engine lubrication}
DRAWBAR FORCE	156 KN (35,100 lbs)

2. Engine

Engine Maker	Mitsubishi
Model	4D34-TEG
Type	4-Cycle, Water Cooled, Direct Injection with Turbocharger, Diesel
Number of Cylinders– Bore X Stroke (4.53")	4–104 mm X 115 mm (4.09" X 4.53")
Displacement	3.91 liter (238 cu in.)
Compression Ratio	16.5 : 1
Output Rating	82 kW (111 HP) / 2,200 rpm
Maximum Torque	382 N•m (283 lb-ft)/ 1,800 rpm
Ignition Order	1–3–4–2 CCW Viewed from Flywheel
Injection Timing	16° Before Top Dead Point
Intake Valve Clearance Cold	0.4 mm (0.0157")
Exhaust Valve Clearance Cold	0.4 mm (0.0157")
Electrical System	D.C. 24 V
Starting Motor	24 V–5.0 kW
Alternator	24 V–35 A
Batteries	2– 12 V- (136 Ah)
Engine Dry Weight*	403 kg (888 lbs)
Thermostat	Begin to open at 76.4°C (169°F). Full open at 90°C (194°F).
Cooling Fan Drive Method	Ø545mm (Ø21.5") Suction Type Belt Drive Pulley Ratio : 0.85
Air Cleaner	Dry Type with Safety Elements

*Less flywheel and electrics.

3. Hydraulic Components

COMPONENT	TYPE
HYDRAULIC PUMPS 2X143 L/min (2x37.9 Gall/min)	Tandem, Variable Displacement, Axial Piston with Pilot Gear Pump.
SWING MOTOR	Axial Piston
TRAVEL MOTOR	Axial Piston
CONTROL VALVES	6 Spool Multiple Control
CYLINDERS (ALL)	Double Acting
RETURN FILTER	Safety Valve containing Filter Type
OIL COOLER	Air Cooled

4. Operating Pressures

Kgf/cm² (psi)

PILOT SYSTEM	50 (710)
IMPLEMENT	350 (4980)
SWING	285 (4050)
TRAVEL	350 (4980)
POWER BOOST/HEAVY LIFT	385 (5470)

MACHINE & COMPONENT WEIGHTS

The following weight specifications are based on the standard machine with standard attachment.

Unit: Kg (lb)

COMPONENT	SK160LC-VI
COMPLETE MACHINE (STANDARD)	16,700 (36,800)
UPPER FRAME ASSEMBLY	6,852 (15,106)
UPPER FRAME + COV & GUARDS	1,831 (4,037)
COUNTERWEIGH	3,007 (6,629)
CAB + ELECT + PANEL + SEAT + AC	415 (915)
*BOOM CYLINDER + lower pins	165 (322) X 2
*ENGINE + MUFFLER + ACCESS	431 (950)
RADIATOR & OIL COOLER	75 (165)
PUMP ASSEMBLY + COUPLER	108 (198)
CONTROL VAVE	250 (551)
*FUEL TANK	99 (218)
*HYDRAULIC TANK	102 (225)
SWING MOTOR & REDUCTION UNIT	204 (450)
HYDRAULIC PIPES & HOSES	316 (697)
LOWER FRAME ASSEMBLY	6,608 (14,568)
FRAME + Guides + Covers + Piping	2,162 (4,766)
SLEWING RING ASSY	218 (481)
TRAVEL MOTOR & REDUCTION UNIT	217 (478) X2
TRACK TENSION + IDLERS	210 (463) X2
LOWER ROLLER ASSEMBLY	35 (77) X14
UPPER ROLLER ASSEMBLY	17 (37) X4
SPROCKET	72 (159) X2
SWIVEL JOINT	30 (66)
TRACK LINK W/ 600mm (23.6") SHOES	1,321 (2,912) X2
ATTACHMENT (STANDARD)	2,638 (5,816)
BUCKET ASSEMBLY [0.52m ³ (0.68 yd ³)]	370 (816)
ARM ASSEMBLY [3.10 m (10'-2")]	857 (1,889)
ARM [3.10 m (10'-2")]	564 (1,340)
*BUCKET CYL + 2 PINS	142 (313)
IDLER LINKS	32 (71)
BUCKET LINK	65 (143)
PINS (4- for bucket, & links)	54 (119)
BOOM ASSEMBLY	1,411 (3,111)
BOOM + Cyl. pin + Foot pin	1,176 (2,593)
*ARM CYLINDER + 2 PINS	215 (474)
PIN (Mounting the Arm)	20 (44)
FLUIDS	311 (686)
HYD OIL	139 (306)
ENG OIL	14 (31)
FUEL	139 (306)
WATER	19 (42)
BOLTS & OTHEER	291 (642)

* DRY WEIGHT



WARNING



USE ONLY LIFTING DEVICES AND EQUIPMENT WITH RATED CAPACITIES SUFFICIENT TO LIFT THE SPECIFIC COMPONENT(S) BEING REMOVED OR INSTALLED.

https://truckmanualshub.com/
MACHINE FAMILIARIZATION

ED190 - PERFORMANCE SPECIFICATIONS

The following performance specifications are based on the standard machine with standard attachment.

1. Travel Speed, Swing Speed & Gradeability

DESCRIPTION	SPECIFICATION
TRAVEL SPEED	6.0 km per hr (3.7 mph) in  mode. 3.6 km per hr (2.2 mph) in  mode.
SWING SPEED	11 RPM IN M-Mode / "HI" Idle.
GRADEABILITY	70% (35°) Limited by engine lubrication
DRAWBAR FORCE	189 KN (42,556 lbs)

2. Engine

Engine Maker	Mitsubishi
Model	4D34-TEG
Type	4-Cycle, Water Cooled, Direct Injection with Turbocharger, Diesel
Number of Cylinders: 4-Bore X Stroke	104mm X 115mm (4.09" X 4.53")
Displacement	3.91 liter (238 cu in.)
Compression Ratio	16.5 : 1
Output Rating	82 kW (111 HP) / 2,200 rpm
Maximum Torque	382 N•m (283 lb-ft) / 1,800 rpm
Ignition Order	1-3-4-2 CCW Viewed from Flywheel
Injection Timing	16° Before Top Dead Point
Intake Valve Clearance Cold	0.4 mm (0.0157")
Exhaust Valve Clearance Cold	0.4 mm (0.0157")
Electrical System	D.C. 24 V
Starting Motor	24 V-5.0 kW
Alternator	24 V-35 A
Batteries	2- 12 V- (136 Ah)
Engine Dry Weight*	403 kg (888 lbs)
Thermostat	Begin to open at 76.4°C (169°F). Full open at 90°C (194°F).
Cooling Fan Drive Method	Ø545mm (Ø21.5") Suction Type Belt Drive Pulley Ratio : 0.85
Air Cleaner	Dry Type with Safety Elements *Less flywheel and electrics.

3. Hydraulic Components

COMPONENT	TYPE
HYDRAULIC PUMPS 2X143 L/min (2x37.9 Gall/min)	Tandem, Variable Displacement, Axial Piston with Pilot Gear Pump.
DOZER PUMP	Gear Pump 61.6 L/Min (16.3/Gal/min)
SWING MOTOR	Axial Piston
TRAVEL MOTOR	Axial Piston
CONTROL VALVES	7 Spool Multiple Control
CYLINDERS (ALL)	Double Acting
RETURN FILTER	Safety Valve containing Filter Type
OIL COOLER	Air Cooled

4. Operating Pressures

PILOT SYSTEM	50 (710)	Kgf/cm ² (psi)
IMPLEMENT	350 (4980)	
SWING	285 (4050)	
TRAVEL	350 (4980)	
POWER BOOST/HEAVY LIFT	385 (5470)	

MACHINE & COMPONENT WEIGHTS

The following weight specifications are based on the standard machine with standard attachment.

Unit: Kg (lb)

COMPONENT	ED190-VI
COMPLETE MACHINE (STANDARD)	19,820 (43,704)
UPPER FRAME ASSEMBLY	6,928 (15,242)
UPPER FRAME + COV & GUARDS	1,405 (3,091)
COUNTERWEIGHT	3,007 (6,615)
CAB + ELECT + PANEL + SEAT + AC	415 (915)
*BOOM CYLINDER + lower pins	165 (322) X 2
*ENGINE + MUFFLER + ACCESS.	431 (950)
RADIATOR & OIL COOLER	75 (165)
PUMP ASSEMBLY + COUPLER	108 (238)
CONTROL VALVE	250 (551)
*FUEL TANK	99 (218)
*HYDRAULIC TANK	102 (225)
SWING MOTOR & REDUCTION UNIT	204 (450)
HYDRAULIC PIPES & HOSES	316 (697)
LOWER FRAME ASSEMBLY	9,728 (21,402)
FRAME + Guides + Covers + Piping	2,162 (4,766)
SLEWING RING ASSY	218 (481)
TRAVEL MOTOR & REDUCTION UNIT	217 (478) X2
TRACK TENSION + IDLERS	210 (463) X2
LOWER ROLLER ASSEMBLY	35 (77) X14
UPPER ROLLER ASSEMBLY	17 (37) X4
SPROCKET	72 (159) X2
SWIVEL JOINT	30 (66)
TRACK LINK W/ 600mm (23.6") SHOES	1,321 (2,912) X2
ATTACHMENT (STANDARD)	2,638 (5,816)
BUCKET ASSEMBLY [0.52m ² (0.68 yd ³)]	370 (816)
ARM ASSEMBLY [3.10 m (10'-2")]	857 (1,889)
ARM [3.10 m (10'-2")]	564 (1,340)
*BUCKET CYL + 2 PINS	142 (313)
IDLER LINKS	32 (71)
BUCKET LINK	65 (143)
PINS (4- for bucket, & links)	54 (119)
BOOM ASSEMBLY	1,411 (3,111)
BOOM + Cyl. pin + Foot pin	1,176 (2,593)
*ARM CYLINDER + 2 PINS	215 (474)
PIN (Mounting the Arm)	20 (44)
FLUIDS	311 (686)
HYD OIL	139 (306)
ENG OIL	14 (31)
FUEL	139 (306)
WATER	19 (42)
BOLTS & OTHERS	291 (642)

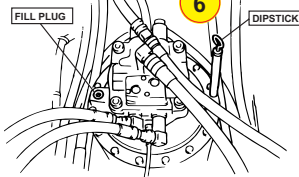
* DRY WEIGHT



WARNING



USE ONLY LIFTING DEVICES AND EQUIPMENT WITH RATED CAPACITIES SUFFICIENT TO LIFT THE SPECIFIC COMPONENT(S) BEING REMOVED OR INSTALLED.



SK160LC/ED190-6E (Minor Change) COMPONENT MAINTENANCE

REF.	COMPONENT (Location)	CAPACITIES		FLUID TYPE LUBRICANT; PART NUMBER					INSPECTION INTERVAL	FIRST MAINTENANCE	NORMAL MAINTENANCE INTERVAL
		SK160LC-6E	ED190-6E								
1	Hydraulic tank	91 L (24 Gal)		HYDRAULIC OIL (Anti-wear, antioxidant and non-foaming) *Machines are shipped from factory with SHELL TELLUS 46 oil					8 Hrs	—	2000 Hrs
	Hydraulic system	159 L (42.0 Gal)		FRIGID -30j C ~ 15j C (-22j F ~ 59j F) ISOVG22	FRIGID -20j C ~ 30j C (-4j F ~ 86j F) ISOVG32	FRIGID-WARM -25j C ~ 40j C (-13j F ~ 104j F) ISOVG32S	WARM -5j C ~ 40j C (23j F ~ 104j F) ISOVG46*	VERY HOT 5j C ~ 55j C (41j F ~ 131j F) ISOVG68			
2	Engine oil pan (H-level)	15 L (4 Gal)		ENGINE OIL (A.P.I. classification for "Service CD") *All engines are shipped from factory with SAE 15W40 oil FRIGID WARM VERY HOT -30j C ~ 30j C -5j C ~ 40j C 30j C and above (-22j F ~ 86j F) (23j F ~ 104j F) (86j F and above) SAE 10W30 SAE 15W40* SAE 15W50					8 Hrs	50 Hrs	500 Hrs
	Engine oil pan (L-level)	13 L (3.4 Gal)									
3	Upper rollers	50 cc (1.69 Fluid Oz) X 4		ENGINE OIL (A.P.I. classification for "Service CD") These components are shipped from factory with SAE 15W40 oil					—	—	2000 Hrs
4	Lower rollers	160 cc X 14 (5.41 Fl. Oz)X14	220 cc X 14 (7.44 Fl. Oz)X14						—	—	2000 Hrs
5	Idlers	200 cc (6.76 Fluid Oz) X 2							—	—	2000 Hrs
6	Swing reduction unit	7.5 L (2.0 Gal)							120 Hrs	500 Hrs	2000 Hrs
7	Travel reduction unit	4.7 L X 2 (1.24 Gal X 2)	9 L X 2 (2.4 Gal X 2)						120 Hrs	500 Hrs	2000 Hrs
8	Operating lever joint	As required in each joint							120 Hrs	—	—
9	Attachment pins	16 Places 14 Places (Dozer)		EP2 GREASE (Extreme pressure multipurpose No. 2 EP type grease)					50 Hrs	—	—
10	Swing bearing	1 Place (90° X 4)							500 Hrs	—	—
11	Track tension adjustment	2 Places							50 Hrs	—	—
12	Water pump bearing	6.1 cc (Aprox. one grease gun shot)		GRASA N.L.G.I. N.2 (Lithium base for bearing)					500 Hrs	—	—
13	Slewing ring grease bath	8.7 Kg (19.2 lbs)		N.L.G.I. N° 2 lithium base grease with MOS ₂					500 Hrs	—	2000 Hrs
14	Radiator	11 L (2.9 Gal)		ANTIFREEZE (LLC) -34.C (-29.2.F) Mixture ratio should protect to 5.C (9.F) lower than the coldest temperature the machine will experience. Take into consideration wind chill factors. Follow antifreeze manufacturer instructions to obtain proper mixture.					8 Hrs	—	2000 Hrs
15	Cooling system total volume	19 L (5 Gal)									
16	Fuel tank	281 L (74.2 Gal)		FRIGID -15j C ~ -25j C (-5j F ~ -13j) Winterized DIESEL ASTM D975 N° 1	DIESEL FUEL WARM -1j C ~ -15j C (5.F ~ 23.F) DIESEL ASTM D975 N° 2		VERY HOT -5.C (23.F) and above DIESEL ASTM D975 N° 2	—	—	—	

A	Hydraulic system return filter	Element: YR50V00004P1	(1)	Kit: YV30T00002F4	—	50 Hrs	500 Hrs
	Return filter (For machines equipped with breaker)	Element: YN50V00001P1	(1)	Kit: YV30T00002F4	—	50 Hrs	500 Hrs
B	Hydraulic suction strainer	YN50V00002S001	(1)	(Includes seal P/N: 45Z91D6)			2000 Hrs
C	Hydraulic tank breather valve filter	YN57V00002S010	(1)				2000 Hrs
D	Pilot system filter	YN50V01001S005	(1)				500 Hrs
E	Engine oil filter	*VAME215002	(1)			50 Hrs	500 Hrs
F	Air cleaner inner element	2446R277S6	(1)		8 Hrs		As required
G	Air cleaner outer element	2446R277S5	(1)		8 Hrs		As required
H	Engine fuel filter	2451R124-2A	(*VAME016823)	(1)		50 Hrs	500 Hrs
I	Priming pump gauze filter	*VAME717651	(1)				500 Hrs
J	A/C fresh air filter	YN50V01006P1	(1)				250 Hrs
K	A/C recirculate air filter	YT20M00004S050	(1)				500 Hrs

*Available only at Kobelco dealers

SK210LC-VI - PERFORMANCE SPECIFICATIONS

The following performance specifications are based on the standard machine with standard attachment.

1. Travel Speed, Swing Speed & Gradeability

DESCRIPTION	SPECIFICATION
TRAVEL SPEED	6.0 km per hr (3.7 mph) in  mode. 4.0 km per hr (2.5 mph) in  mode.
SWING SPEED	11 RPM IN M-Mode / "HI" Idle.
GRADEABILITY	70% (35°) {Limited by engine lubrication}
DRAWBAR FORCE	20,190 Kgf (44,512 lbs)

2. Engine

Engine Maker	Mitsubishi
Model	6D34-TEB
Type	4-Cycle, Water Cooled, Direct Injection with Turbocharger, Diesel
Number of Cylinders- Bore X Stroke (4.53")	6-104 mm X 115 mm (4.09" X 4.53")
Displacement	5,861 liter (358 cu in.)
Compression Ratio	16.5 : 1
Output Rating	107 kW (144 HP) / 2,000 rpm
Maximum Torque	519 N·m (383 lb-ft) / 1,600 rpm
Ignition Order	1-5-3-6-2-4 Clockwise Rotation
Injection Timing	15° Before Top Dead Point
Intake Valve Clearance Cold	0.4 mm (0.0157")
Exhaust Valve Clearance Cold	0.4 mm (0.0157")
Electrical System	D.C. 24 V
Starting Motor	24 V-5.0 kW
Alternator	24 V-35 A
Batteries	2- 12 V- (136 Ah)
Engine Dry Weight*	470 kg (1,040 lbs)
Thermostat	Begin to open at 76.5°C (170°F). Full open at 90°C (194°F).
Cooling Fan Drive Method	Ø600 (Ø24") Suction Type Belt Drive Pulley Ratio : 1.00
Air Cleaner	Dry Type with Safety Elements

*Less flywheel and electrics.

3. Hydraulic Components

COMPONENT	TYPE
HYDRAULIC PUMPS 2X210 L/min (55.5 Gal/min)	Tandem, Variable Displacement, Axial Piston with Pilot Gear Pump.
SWING MOTOR	Axial Piston
TRAVEL MOTOR	Axial Piston
CONTROL VALVES	6 Spool Multiple Control
CYLINDERS (ALL)	Double Acting
RETURN FILTER	Safety Valve containing Filter Type
OIL COOLER	Air Cooled

4. Operating Pressures

Kgf/cm² (psi)

PILOT SYSTEM	50 (710)
IMPLEMENT	350 (4980)
SWING	285 (4050)
TRAVEL	350 (4980)
POWER BOOST/HEAVY LIFT	385 (5470)

1A. MACHINE & COMPONENT WEIGHTS

The following weight specifications are based on the standard machine with standard attachment.

Unit: Kg (lb)

COMPONENT	SK210LC-VI
COMPLETE MACHINE (STANDARD)	20,500 (45,200)
UPPER FRAME ASSEMBLY	9,400 (20,720)
COUNTERWEIGHT	4,500 (9,920)
CAB	260 (570)
BOOM CYLINDER*	168 (370) X 2
ENGINE*	470 (1,040)
RADIATOR & OIL COOLER	97 (210)
PUMP ASSEMBLY	142 (310)
CONTROL VALVE	280 (620)
FUEL TANK*	91 (200)
HYDRAULIC TANK*	143 (320)
SWING MOTOR & REDUCTION UNIT	235 (520)
LOWER FRAME ASSEMBLY	7,500 (16,530)
SLEWING RING	245 (540)
TRAVEL MOTOR & REDUCTION UNIT	250 (550) X2
IDLER ASSEMBLY	106 (230) X2
LOWER ROLLER ASSEMBLY	35 (77) X16
UPPER ROLLER ASSEMBLY	22 (48) X4
TRACK TENSION ASSEMBLY	104 (230) X2
SPROCKET	54 (120) X2
SWIVEL JOINT	30 (66)
TRACK LINK W/ 800mm (31.5") SHOES	1,720 (3,784) X2
TRACK LINK	540 (1,190) X2
ATTACHMENT (STANDARD)	3,600 (7,930)
BUCKET ASSEMBLY [0.81m ³ (1.06 cu yd)]	650 (1,430)
ARM ASSEMBLY [2.94 m (9'-8")]	980 (2,160)
ARM [2.94 m (9'-8")]	610 (1,340)
BUCKET CYLINDER*	135 (300)
IDLER LINK	21 (46) X2
BUCKET LINK	91 (200)
PIN (2 PCS for mtg bucket cyl & bucket)	65 (140)
BOOM ASSEMBLY	1,650 (3,640)
BOOM	1,320 (2,910)
ARM CYLINDER*	230 (510)
PIN (Mounting the Arm)	27 (59)
FLUIDS	540 (1,190)
HYD OIL	215 (470)
ENG OIL	20 (44)
FUEL	285 (630)
WATER	20 (44)

* DRY WEIGHT



WARNING



USE ONLY LIFTING DEVICES AND EQUIPMENT WITH RATED CAPACITIES SUFFICIENT TO LIFT THE SPECIFIC COMPONENT(S) BEING REMOVED OR INSTALLED.

SK250LC-VI - PERFORMANCE SPECIFICATIONS

The following performance specifications are based on the standard machine with standard attachment.

1. Travel Speed, Swing Speed & Gradeability

DESCRIPTION	SPECIFICATION
TRAVEL SPEED	6.0 km per hr (3.7 mph) in  mode. 4.0 km per hr (2.5 mph) in  mode.
SWING SPEED	11 RPM IN M-Mode / "HI" Idle.
GRADEABILITY	70% (35°) {Limited by engine lubrication}
DRAWBAR FORCE	20,190 Kgf (44,512 lbs)

2. Engine

Engine Maker	Mitsubishi
Model	6D34-TLEB
Type	4-Cycle, Water Cooled, Direct Injection with Turbocharger, Diesel
Number of Cylinders- Bore X Stroke	6-104 mm X 115 mm (4.09" X 4.53")
Displacement	5,861 liter (358 cu in.)
Compression Ratio	18.2 : 1
Output Rating	125 kW (168 HP) / 2,100 rpm
Maximum Torque	590 N•m (435 lb-ft)/ 1,600 rpm
Ignition Order	1-5-3-6-2-4 Clockwise Rotation
Injection Timing	17° Before Top Dead Point
Intake Valve Clearance Cold	0.4 mm (0.0157")
Exhaust Valve Clearance Cold	0.4 mm (0.0157")
Electrical System	D.C. 24 V
Starting Motor	24 V-5.0 kW
Alternator	24 V-35 A
Batteries	2- 12 V- (136 Ah)
Engine Dry Weight*	470 kg (1,040 lbs)
Thermostat	Begin to open at 76.5°C (170°F). Full open at 90°C (194°F).
Cooling Fan Drive Method	Ø600 (Ø24") Suction Type Belt Drive Pulley Ratio : 1.00
Air Cleaner	Dry Type with Safety Elements

*Less flywheel and electrics.

3. Hydraulic Components

COMPONENT	TYPE
HYDRAULIC PUMPS 2X240 L/min (63.4 Gall/min)	Tandem, Variable Displacement, Axial Piston with Pilot Gear Pump.
SWING MOTOR	Axial Piston
TRAVEL MOTOR	Axial Piston
CONTROL VALVES	6 Spool Multiple Control
CYLINDERS (ALL)	Double Acting
RETURN FILTER	Safety Valve containing Filter Type
OIL COOLER	Air Cooled

4. Operating Pressures

Kgf/cm² (psi)

PILOT SYSTEM	50 (710)
IMPLEMENT	350 (4980)
SWING	285 (4050)
TRAVEL	350 (4980)
POWER BOOST/HEAVY LIFT	385 (5470)

1A. MACHINE & COMPONENT WEIGHTS

The following weight specifications are based on the standard machine with standard attachment.

Unit: Kg (lb)

COMPONENT	SK250LC-VI
COMPLETE MACHINE (STANDARD)	24,100 (53,130)
UPPER FRAME ASSEMBLY	11,400 (25,130)
COUNTERWEIGHT	5,510 (12,150)
CAB	260 (570)
BOOM CYLINDER*	220 (490) X 2
ENGINE*	480 (1,060)
RADIATOR & OIL COOLER	97 (210)
PUMP ASSEMBLY	142 (310)
CONTROL VALVE	280 (620)
FUEL TANK*	91 (200)
HYDRAULIC TANK*	143 (320)
SWING MOTOR & REDUCTION UNIT	290 (640)
LOWER FRAME ASSEMBLY	8,800 (19,400)
SLEWING RING	364 (800)
TRAVEL MOTOR & REDUCTION UNIT	300 (660) X2
IDLER ASSEMBLY	106 (230) X2
LOWER ROLLER ASSEMBLY	35 (77) X16
UPPER ROLLER ASSEMBLY	22 (48) X4
TRACK TENSION ASSEMBLY	94 (210) X2
SPROCKET	54 (120) X2
SWIVEL JOINT	30 (66)
TRACK LINK W/ 800mm (31.5") SHOES	1,490 (3,280) X2
TRACK LINK	580 (1,276) X2
ATTACHMENT (STANDARD)	3,900 (8,600)
BUCKET ASSEMBLY [0.81m ³ (1.06 cu yd)]	780 (1,720)
ARM ASSEMBLY [2.94 m (9'-8")]	1,150 (2,540)
ARM [2.94 m (9'-8")]	710 (1,570)
BUCKET CYLINDER*	177 (390)
IDLER LINK	25 (55) X2
BUCKET LINK	98 (220)
PIN (2 PCS for mtg bucket cyl & bucket)	80 (180)
BOOM ASSEMBLY	2,140 (4,720)
BOOM	1,670 (3,680)
ARM CYLINDER*	300 (660)
PIN (Mounting the Arm)	28 (62)
FLUIDS	550 (1,210)
HYD OIL	225 (500)
ENG OIL	20 (44)
FUEL	285 (630)
WATER	22 (48)

* DRY WEIGHT



WARNING



USE ONLY LIFTING DEVICES AND EQUIPMENT WITH RATED CAPACITIES SUFFICIENT TO LIFT THE SPECIFIC COMPONENT(S) BEING REMOVED OR INSTALLED.

SK210/SK250LC-6E-MC

SK210LC/SK250-6E (Minor Change) COMPONENT MAINTENANCE

SK210/SK250LC-6E-MC

REF.	COMPONENT (Location)	CAPACITIES		FLUID TYPE LUBRICANT; PART NUMBER					INSPECTION INTERVAL	FIRST MAINTENANCE	NORMAL MAINTENANCE INTERVAL
		SK210LC-6E	SK250LC-6E								
1	Hydraulic tank	156 L (41 Gal)		HYDRAULIC OIL (Anti-wear, antioxidant and non-foaming) *Machines are shipped from factory with SHELL TELLUS 46 oil					8 Hrs		2000 Hrs
	Hydraulic system	246 L (65 Gal)	260 L (69 Gal)	FRIGID -30ᵢ C ~ 15ᵢ C (-22ᵢ F ~ 59ᵢ F) ISOVG22	FRIGID -20ᵢ C ~ 30ᵢ C (-4ᵢ F ~ 86ᵢ F) ISOVG32	FRIGID-WARM -25ᵢ C ~ 40ᵢ C (-13ᵢ F ~ 104ᵢ F) ISOVG32S	WARM -5ᵢ C ~ 40ᵢ C (23ᵢ F ~ 104ᵢ F) ISOVG46*	VERY HOT 5ᵢ C ~ 55ᵢ C (41ᵢ F ~ 131ᵢ F) ISOVG68			
2	Engine oil pan* (H-level)	18 L (4.8 Gal)		ENGINE OIL (A.P.I. clasification for "Service CD") *All engines are shipped from factory with SAE 15W40 oil					8 Hrs	50 Hrs	500 Hrs
	Engine oil pan* (L-level)	15.5 L (4.1 Gal)		FRIGID -30ᵢ C ~ 30ᵢ C (-22ᵢ F ~ 86ᵢ F) SAE 10W30	WARM -5ᵢ C ~ 40ᵢ C (23ᵢ F ~ 104ᵢ F) SAE 15W40*	VERY HOT 30ᵢ C and above (86ᵢ F and above) SAE 15W50					
3	Upper rollers	50 cc (1.69 Fluid Oz.) X 4		ENGINE OIL (A.P.I. clasification for "Service CD") These components are shipped from factory with SAE 15W40 oil							2000 Hrs
4	Lower rollers	160 cc (5.41 Fluid Oz.) X 14 160 cc (5.41 Fluid Oz.) X 16 - LC									2000 Hrs
5	Idlers	200 cc (6.76 Fluid Oz.) X 2									2000 Hrs
6	Swing reduction unit	7.5 L (2.0 Gal)	15.3 L (4.0 Gal)						120 Hrs	500 Hrs	2000 Hrs
7	Travel reduction unit	5.5 L X 2 (1.5 Gal X 2)	4.7 L X 2 (1.2 Gal X 2)						120 Hrs	500 Hrs	2000 Hrs
8	Operating lever joint	As required in each joint		EP2 GREASE (Extreme pressure multipurpose No. 2 EP type grease)					120 Hrs		
9	Attachment pins	16 Places							50 Hrs		
10	Swing bearing	1 Place (90.X 4)							500 Hrs		
11	Track tension adjustment	2 places							50 Hrs		
12	Water pump bearing	6.1 cc (Aprox. one grease gun shot)		GRASA N.L.G.I. N. 2 (Lithium base for bearing)					500 Hrs		
13	Slewing ring grease bath	8.3 Kg (18.3 lbs)	11.3 Kg (24.9 lbs)	N.L.G.I. № 2 lithium base grease with MOS₂					500 Hrs		2000 Hrs
14	Radiator	9.5 L (2.5 Gal)		ANTIFREEZE (LLC) -34.C (-29.2.F) Mixture ratio should protect to 5.C (9.F) lower than the coldest temperature the machine will experience. Take into consideration wind chill factors. Follow antifreeze manufacturer instructions to obtain proper mixture.					8 Hrs		2000 Hrs
15	Cooling system total volume	19 L (5 Gal)	22 L (5.8 Gal)								
16	Fuel tank	340 L (90 Gal)		FRIGID -15ᵢ C ~ -25ᵢ C (-5ᵢ F ~ -13ᵢ) Winterized DIESEL ASTM D975 № 1	WARM -1ᵢ C ~ -15ᵢ C (5.F ~ 23.F) DIESEL ASTM D975 № 2	VERY HOT -5.C (23..F) and above DIESEL ASTM D975 № 2				500 Hrs	

*Filter capacity: 1.1 L (0.3 Gal); 4.9 L (1.3 Gal) residual; Total engine oil volume: 24 L (6.3 Gal)

A	Hydraulic system return filter	Element: YR50V00001P1 (1)	Kit: YN30T00007F1		50 Hrs	500 Hrs
	Return filter (For machines equipped with breaker)	Element: YN50V00009P1 (1)	Kit: YN30T00007F2		50 Hrs	500 Hrs
B	Hydraulic suction strainer	YN50V00002S001 (1)	(Includes seal P/N: 45Z91D6)			2000 Hrs
C	Hydraulic tank breather valve filter	YN57V00002S010 (1)				2000 Hrs
D	Pilot system filter	YN50V01001S005 (1)	(Includes O-ring seal P/N: YN50V01001S005)			500 Hrs
E	Engine oil filter	*VAME215002 (1)			50 Hrs	500 Hrs
F	Air cleaner inner element	2446R255S6 (1)		8 Hrs		As required
G	Air cleaner outer element	2446R255S5 (1)		8 Hrs		As required
H	Engine fuel filter	*VAME015254 (1)			50 Hrs	500 Hrs
I	Priming pump gauze filter	*VAME717651 (1)				500 Hrs
J	A/C fresh air filter	YN50V01006P1 (1)				250 Hrs
K	A/C recirculate air filter	YT20M00004S050 (1)				500 Hrs

*Available only at KOBELCO dealers

SK290LC-VI - PERFORMANCE SPECIFICATIONS

The following performance specifications are based on the standard machine with standard attachment.

1. Travel Speed, Swing Speed & Gradeability

DESCRIPTION	SPECIFICATION
TRAVEL SPEED	5.6 km per hr (3.5 mph) in  mode. 3.5 km per hr (2.2 mph) in  mode.
SWING SPEED	11 RPM IN M-Mode / "HI" Idle.
GRADEABILITY	70% (35°) {Limited by engine lubrication}
DRAWBAR FORCE	26,218 Kgf (57,800 lbs)

2. Engine

Engine Maker	Mitsubishi
Model	6D16-TLEC
Type	4-Cycle, Water Cooled, Direct Injection with Turbo & Inner cooler
Number of Cylinders- Bore X Stroke	6-118 mm X 115 mm (4.65" X 4.53")
Displacement	7,545 liter (460 cu in.)
Compression Ratio	17.5 : 1
Output Rating	138 kW (185 HP) / 2,100 rpm
Maximum Torque	726 N•m (534 lb-ft)/ 1,600 rpm
Ignition Order	1-5-3-6-2-4 Clockwise Rotation
Injection Timing	15° Before Top Dead Point
Intake Valve Clearance Cold	0.4 mm (0.0157")
Exhaust Valve Clearance Cold	0.4 mm (0.0157")
Electrical System	D.C. 24 V
Starting Motor	24 V-5.0 kW
Alternator	24 V-35 A
Batteries	2- 12 V- (136 Ah)
Engine Dry Weight*	580 kg (1,280 lbs)
Thermostat	Begin to open at 76.5°C (170°F). Full open at 90°C (194°F).
Cooling Fan Drive Method	Ø620 (Ø24.2") Suction Type Belt Drive Pulley Ratio : 0.90
Air Cleaner	Dry Type with Safety Elements

*Less flywheel and electrics.

3. Hydraulic Components

COMPONENT	TYPE
HYDRAULIC PUMPS 2X210 L/min (55.5 Gal/min)	Tandem, Variable Displacement, Axial Piston with Pilot Gear Pump.
SWING MOTOR	Axial Piston
TRAVEL MOTOR	Axial Piston
CONTROL VALVES	6 Spool Multiple Control
CYLINDERS (ALL)	Double Acting
RETURN FILTER	Safety Valve containing Filter Type
OIL COOLER	Air Cooled

4. Operating Pressures

Kgf/cm² (psi)

PILOT SYSTEM	50 (710)
IMPLEMENT	350 (4980)
SWING	280 (3980)
TRAVEL	350 (4980)
POWER BOOST/HEAVY LIFT	385 (5470)

1A. MACHINE & COMPONENT WEIGHTS

The following weight specifications are based on the standard machine with standard attachment.

Unit: Kg (lb)

COMPONENT	SK290LC-VI
COMPLETE MACHINE (STANDARD)	30,000 (66,100)
UPPER FRAME ASSEMBLY	12,937 (28,513)
COUNTERWEIGHT	6,118 (13,484)
CAB + CONTROLS + A/C + SEAT	836 (1,843)
BOOM CYLINDER*	270 (595) X 2
ENGINE + MUFFLER + MINOR ITEMS	716 (1,578)
RADIATOR & OIL COOLER	175 (386)
PUMP ASSEMBLY + COUPLING	148 (326)
CONTROL VALVE	441 (972)
FUEL TANK*	170 (375)
HYDRAULIC TANK*	173 (381)
SWING MOTOR & REDUCTION UNIT	511 (1,126)
UPPER FRAME + GUARDS & COVERS	3,109 (6,852)
LOWER FRAME ASSEMBLY	11,232 (24,755)
CAR BODY	3,618 (7,974)
SLEWING RING	586 (1,292)
TRAVEL MOTOR + RED. UNIT	309 (697) X2
IDLER ASSEMBLY	170 (370) X2
LOWER ROLLER ASSEMBLY	45 (77) X18
UPPER ROLLER ASSEMBLY	26 (57) X4
TRACK TENSION ASSEMBLY	127 (280) X2
SPROCKET + BOLTS	76 (168) X2
SWIVEL JOINT + LOWER LINES	74 (163)
TRACK CHAINS W/800mm (31.5") SHOES	2,338 (5,153) X2
TRACK GUIDES + GREASE BATH + MOTOR COVERS	90 (198)
ATTACHMENT (STANDARD)	5,136 (11,320)
BUCKET ASSEMBLY [1.20M ³ (1.57 CU YD)]	954 (2,100)
ARM ASSEMBLY [3.2 m (10'- 6")]	1,485 (3,273)
ARM	952 (2,098)
BUCKET CYLINDER	220 (485)
IDLER LINK	27 (60) X2
BUCKET LINK	130 (290)
PIN (6 PCS for mtg bucket cyl, links, bckt & arm cyl rod)	139 (306)
BOOM ASSEMBLY	2,697 (5,944)
BOOM	2,116 (4,664)
ARM CYLINDER*	370 (816)
PINS (4 PCS for mtg arm cyl, boom cyl's & boom)	211 (465)
FLUIDS	554 (1,221)
HYD OIL	171 (377)
FUEL	348 (767)
WATER	35 (77)

* DRY WEIGHT



WARNING



USE ONLY LIFTING DEVICES AND EQUIPMENT WITH RATED CAPACITIES SUFFICIENT TO LIFT THE SPECIFIC COMPONENT(S) BEING REMOVED OR INSTALLED.

SK330LC-VI - PERFORMANCE SPECIFICATIONS

The following performance specifications are based on the standard machine with standard attachment.

1. Travel Speed, Swing Speed & Gradeability

DESCRIPTION	SPECIFICATION
TRAVEL SPEED	5.8 km per hr (3.6 mph) in  mode. 3.4 km per hr (2.1 mph) in  mode.
SWING SPEED	11 RPM IN M-Mode / "HI" Idle.
GRADEABILITY	70% (35°) {Limited by engine lubrication}
DRAWBAR FORCE	28,950 Kgf (63,800 lbf)

2. Engine

Engine Maker	Mitsubishi
Model	6D16-TLEB
Type	4-Cycle, Water Cooled, Direct Injection with Turbo & Innercooler
Number of Cylinders- Bore X Stroke	6-118 mm X 115 mm (4.65" X 4.53")
Displacement	7,545 liter (460 cu in.)
Compression Ratio	17.5 : 1
Output Rating	177 kW (238 Hp) / 2,200 rpm
Maximum Torque	824 N•m (608 lb-ft) / 1,800 rpm
Ignition Order	1-5-3-6-2-4 Clockwise Rotation
Injection Timing	14° Before Top Dead Point
Intake Valve Clearance Cold	0.4 mm (0.0157")
Exhaust Valve Clearance Cold	0.4 mm (0.0157")
Electrical System	D.C. 24 V
Starting Motor	24 V-5.0 KW
Alternator	24 V-35 A
Batteries	2- 12 V- (136 Ah)
Engine Dry Weight*	580 kg (1,280 lbs)
Thermostat	Begin to open at 76.5°C (170°F). Full open at 90°C (194°F).
Cooling Fan Drive Method	Ø620 (Ø24.2") Suction Type Belt Drive Pulley Ratio : 0.90
Air Cleaner	Dry Type with Safety Elements

*Less flywheel and electrics.

3. Hydraulic Components

COMPONENT	TYPE
HYDRAULIC PUMPS 2X242 L/min (63.4 Gal/min)	Tandem, Variable Displacement, Axial Piston with Pilot Gear Pump.
SWING MOTOR	Axial Piston
TRAVEL MOTOR	Axial Piston
CONTROL VALVES	6 Spool Multiple Control
CYLINDERS (ALL)	Double Acting
RETURN FILTER	Safety Valve containing Filter Type
OIL COOLER	Air Cooled

4. Operating Pressures

Kgf/cm² (psi)

PILOT SYSTEM	50 (710)
IMPLEMENT	350 (4980)
SWING	280 (3980)
TRAVEL	350 (4980)
POWER BOOST/HEAVY LIFT	385 (5470)

1A. MACHINE & COMPONENT WEIGHTS

The following weight specifications are based on the standard machine with standard attachment.

Unit: Kg (lb)

COMPONENT	SK330LC-VI
COMPLETE MACHINE (STANDARD)	35,300 (77,800)
UPPER FRAME ASSEMBLY	15,998 (35,260)
COUNTERWEIGHT	8,420 (18,558)
CAB + CONTROLS + A/C + SEAT	836 (1,843)
BOOM CYLINDER*	270 (595) X 2
ENGINE + MUFFLER + MINOR ITEMS	716 (1,578)
RADIATOR & OIL COOLER	175 (386)
PUMP ASSEMBLY + COUPLING	148 (326)
CONTROL VALVE	475 (1,047)
FUEL TANK*	204 (450)
HYDRAULIC TANK*	173 (381)
SWING MOTOR & REDUCTION UNIT	511 (1,126)
UPPER FRAME + GUARDS & COVERS	3,800 (8,375)
LOWER FRAME ASSEMBLY	12,362 (27,167)
CARBODY	3,990 (8,794)
SLEWING RING	586 (1,292)
TRAVEL MOTOR + RED. UNIT	360 (790) X2
IDLER ASSEMBLY	170 (370) X2
LOWER ROLLER ASSEMBLY	58 (130) X18
UPPER ROLLER ASSEMBLY	30 (66) X4
TRACK TENSION ASSEMBLY	190 (420) X2
SPROCKET + BOLTS	88 (190) X2
SWIVEL JOINT + LOWER LINES	85 (187)
TRACK CHAINS W/800mm (31.5") SHOES	2,390 (5,286) X2
TRACK GUIDES + GREASE NBATH + MOTOR COVERS	105 (231)
ATTACHMENT (STANDARD)	6,134 (13,519)
BUCKET ASSEMBLY [1.20M ³ (1.57 CU YD)]	1,040 (2,290)
ARM ASSEMBLY [3.2 m (10' - 6")]	1,785 (3,875)
ARM	1,160 (2,560)
BUCKET CYLINDER	260 (570)
IDLER LINK	27 (60) X2
BUCKET LINK	130 (290)
PIN (6 PCS for mtg bucket cyl, links, bckt & arm cyl rod)	139 (306)
BOOM ASSEMBLY	3,336 (7,353)
BOOM	2,580 (5,690)
ARM CYLINDER*	500 (1,100)
PINS (4 PCS for mtg arm cyl, boom cyl's & boom)	256 (485)
FLUIDS	805 (1,774)
HYD OIL	304 (670)
FUEL	466 (1,030)
WATER	35 (77)

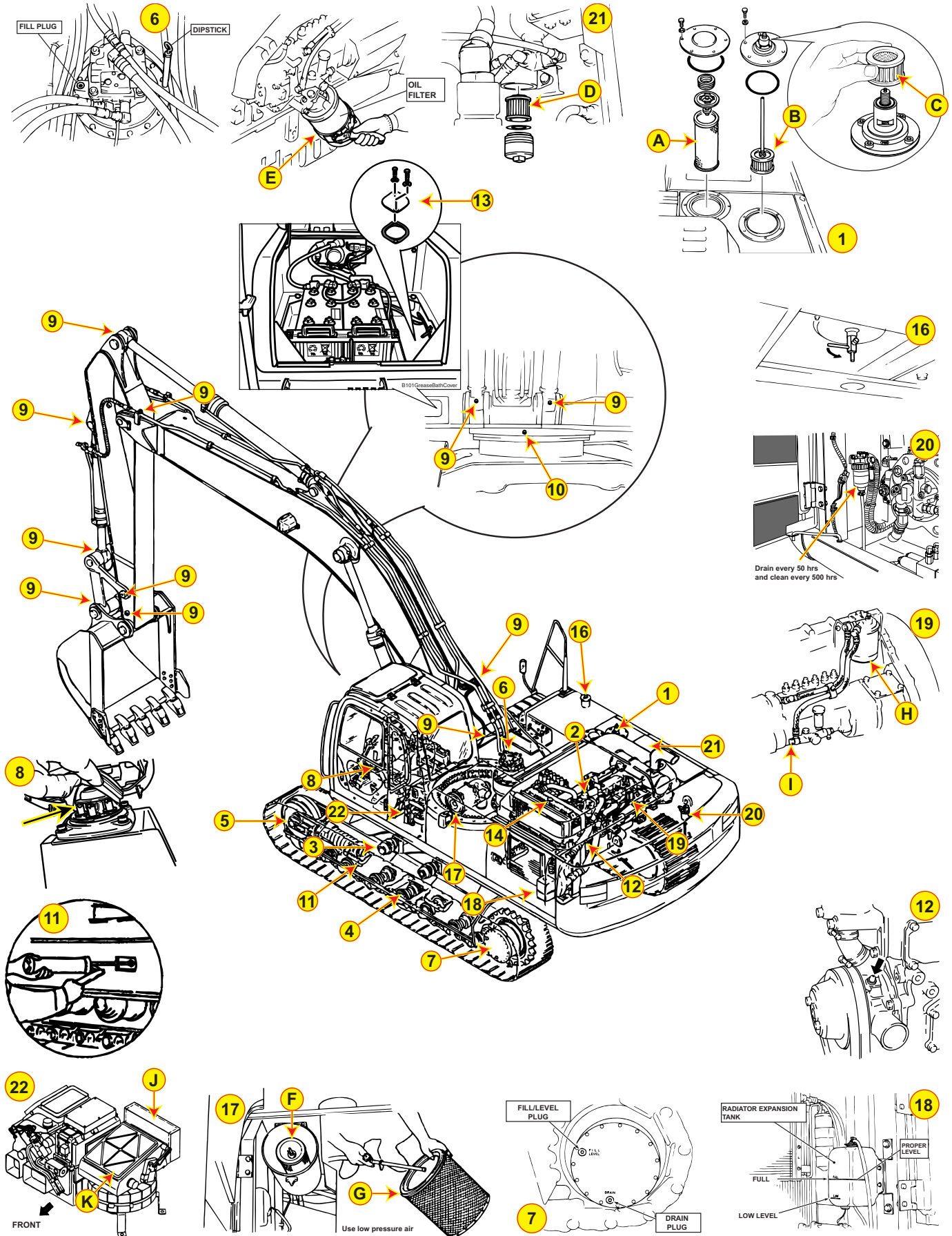
* DRY WEIGHT



WARNING



USE ONLY LIFTING DEVICES AND EQUIPMENT WITH RATED CAPACITIES SUFFICIENT TO LIFT THE SPECIFIC COMPONENT(S) BEING REMOVED OR INSTALLED.



SK290LC/SK330-6E (Minor Change) COMPONENT MAINTENANCE

REF.	COMPONENT (Location)	CAPACITIES		FLUID TYPE LUBRICANT; PART NUMBER	INSPECTION INTERVAL	FIRST MAINTENANCE	NORMAL MAINTENANCE INTERVAL		
		SK290LC-6E	SK330LC-6E						
1	Hydraulic tank	197 L (52.5 Gal)	206 L (54 Gal)	HYDRAULIC OIL (Anti-wear, antioxidant and non-foaming) *Machines are shipped from factory with SHELL TELLUS 46 oil		8 Hrs	2000 Hrs		
	Hydraulic system	351 L (93.0 Gal)		FRIGID -30j C ~ 15j C (-22j F ~ 59j F) ISOVG22	FRIGID -20j C ~ 30j C (-4j F ~ 86j F) ISOVG32			FRIGID-WARM -25j C ~ 40j C (-13j F ~ 104j F) ISOVG32S	WARM -5j C ~ 40j C (23j F ~ 104j F) ISOVG46*
2	Engine oil pan* (H-level)	*28 L (7.4 Gal)		ENGINE OIL (A.P.I. classification for "Service CD") *All engines are shipped from factory with SAE 15W40 oil FRIGID WARM VERY HOT -30j C ~ 30j C -5j C ~ 40j C 30j C and above (-22j F ~ 86j F) (23j F ~ 104j F) (86j F and above) SAE 10W30 SAE 15W40* SAE 15W50			8 Hrs	50 Hrs	500 Hrs
	Engine oil pan* (L-level)	*23 L (6.1 Gal)							
3	Upper rollers	50 cc (1.69 Fl.Oz) X 4	100 cc (3.4 Fl. Oz) X 4	ENGINE OIL (A.P.I. classification for "Service CD") These components are shipped from factory with SAE 15W40 oil					2000 Hrs
4	Lower rollers	300 cc (10.1 Fl. Oz) X 18	430 cc (14.1 Fl. Oz) X 16						2000 Hrs
5	Idlers	250 cc (8.5 Fl. Oz) X 2	350 cc (11.1 Fl. Oz) X 2						2000 Hrs
6	Swing reduction unit	21.5 L (5.7 Gal)		GEAR OIL (Grade GL-4 by A.P.I. classification) Extreme pressure gear oil # 90			120 Hrs	500 Hrs	2000 Hrs
7	Travel reduction unit	10.5 L (2.8 Gal) X 2					120 Hrs	500 Hrs	2000 Hrs
8	Operating lever joint	As required		EP2 GREASE (Extreme pressure multipurpose No. 2 EP type grease)			120 Hrs		
9	Attachment pins	16 Places					50 Hrs		
10	Swing bearing	1 Place (90.X 4)					500 Hrs		
11	Track tension adjustment	2 places					50 Hrs		
12	Water pump bearing	6.1 cc (Aprox. one grease gun shot)		GRASA N.L.G.I. N. 2 (Lithium base for bearing)			500 Hrs		
13	Slewing ring grease bath	15.7 Kg (34.6 lbs)		N.L.G.I. N° 2 lithium base grease with MOS ₂			500 Hrs		2000 Hrs
14	Radiator	15 L (4 Gal)		ANTIFREEZE (LLC) -34.C (-29.2.F) Mixture ratio should protect to 5.C (9.F) lower than the coldest temperature the machine will experience. Take into consideration wind chill factors. Follow antifreeze manufacturer instructions to obtain proper mixture.			8 Hrs		2000 Hrs
15	Cooling system total volume	34 L (9 Gal)							
16	Fuel tank	420 L (112 Gal)	560 L (148 Gal)	DIESEL FUEL FRIGID WARM VERY HOT -15j C ~ -25j C -1j C ~ -15j C -5.C (23.F) and above (-5j F ~ -13j F) Winterized (5.F ~ 23.F) DIESEL ASTM D975 N° 1 DIESEL ASTM D975 N° 2 DIESEL ASTM D975 N° 2					

*Total engine oil volume (including filter): 32 L (8.5 Gal)

A	Hydraulic system return filter	Element kit: YN50V00004F3 (1)		50 Hrs	500 Hrs
	Return filter (For machines equipped with breaker)	Element: YN50V00009P1 (1) Seal: ZD11G20000		50 Hrs	500 Hrs
B	Hydraulic suction strainer	LC50V00001F1 (1) (Includes seal P/N: 45Z91D6)			2000 Hrs
C	Hydraulic tank breather valve filter	YN57V00002S010 (1)			2000 Hrs
D	Pilot system filter	YN50V01001S005 (1)			500 Hrs
E	Engine oil filter	*VAME130968 (1)		50 Hrs	500 Hrs
F	Air cleaner inner element	YN11P01013P1 (1)		8 Hrs	As required
G	Air cleaner outer element	YN11P00001S002 (1)		8 Hrs	As required
H	Engine fuel filter	*VAME055670 (1)		50 Hrs	500 Hrs
I	Priming pump gauze filter	*VAME717659 (1)			500 Hrs
J	A/C fresh air filter	YN50V01006P1 (1)			250 Hrs
K	A/C recirculate air filter	YT20M00004S050 (1)			500 Hrs

*Available only at KOBELCO dealers

SK480 - PERFORMANCE SPECIFICATIONS

The following performance specifications are based on the standard machine with standard attachment.

1. Travel Speed, Swing Speed & Gradeability

DESCRIPTION	SPECIFICATION
TRAVEL SPEED	5.6 km per hr (3.5 mph) in  mode. 3.5 km per hr (2.2 mph) in  mode.
SWING SPEED	9 RPM IN M-Mode / "HI" Idle.
GRADEABILITY	70% (35°) {Limited by engine lubrication}
DRAWBAR FORCE	26,218 Kgf (57,800 lbs)

2. Engine

Engine Maker	Mitsubishi
Model	6D24-TLA2B
Type	4-Cycle, Water Cooled, Direct Injection with Turb & Inner cooler
Number of Cylinders– Bore X Stroke	6–130 mm X 150 mm (5.12" X 5.91")
Displacement	11.950 Liter (729 cu in.)
Compression Ratio	17.5 : 1
Output Rating	250kW (335 HP) / 2,130 rpm
Maximum Torque	1,275 N•m (940 lb-ft)/ 1,600 rpm
Ignition Order	1–5–3–6–2–4 Clockwise Rotation
Injection Timing	2° Before Top Dead Point
Intake Valve Clearance Cold	0.4 mm (0.0157")
Exhaust Valve Clearance Cold	0.6 mm (0.0236")
Electrical System	D.C. 24 V
Starting Motor	24 V–5.0 KW
Alternator	24 V–35 A
Batteries	2– 12 V- (136 Ah)
Engine Dry Weight*	580 kg (1,280 lbs)
Thermostat	Begin to open at 76.5°C (170°F). Full open at 90°C (194°F).
Cooling Fan Drive Method	Ø620 (Ø24.2") Suction Type Belt Drive Pulley Ratio : 0.90
Air Cleaner	Dry Type with Safety Elements

*Less flywheel and electrics.

3. Hydraulic Components

COMPONENT	TYPE
HYDRAULIC PUMPS 2X210 L/min (55.5 Gal/min)	Tandem, Variable Displacement, Axial Piston with Pilot Gear Pump.
SWING MOTOR	Axial Piston
TRAVEL MOTOR	Axial Piston
CONTROL VALVES	6 Spool Multiple Control
CYLINDERS (ALL)	Double Acting
RETURN FILTER	Safety Valve containing Filter Type
OIL COOLER	Air Cooled

4. Operating Pressures

Kgf/cm² / (psi) / [MPa]

PILOT SYSTEM	49.9 / (710) / [4.9 MPa]
IMPLEMENT	320 / (4554) / [31.4 MPa]
SWING	260 / (3698) / [25.5 MPa]
TRAVEL	349 / (4974) / [34.3 MPa]
POWER BOOST/HEAVY LIFT	349 / (4974) / [34.3 MPa]

1A. MACHINE & COMPONENT WEIGHTS

The following weight specifications are based on the standard machine with standard attachment.

Unit: Kg (lb)

COMPONENT	SK480LC-VI
COMPLETE MACHINE (STANDARD)	49,100 (108,000)
UPPER FRAME ASSEMBLY	20,800 (45,760)
COUNTERWEIGHT	10,027 (22,059)
CAB	260 (570)
BOOM CYLINDER*	422 (928) X 2
ENGINE + MUFFLER + MINOR ITEMS	1,100 (2,420)
RADIATOR & OIL COOLER	186 (410)
PUMP ASSEMBLY	187 (420)
CONTROL VALVE	380 (840)
FUEL TANK*	230 (510)
HYDRAULIC TANK*	360 (790)
SWING MOTOR & REDUCTION UNIT	722 (1,590)
LOWER FRAME ASSEMBLY	19,000 (41,800)
SLEWING RING	700 (1,540)
TRAVEL MOTOR + RED. UNIT	650 (1,430) X2
IDLER ASSEMBLY	270 (600) X2
LOWER ROLLER ASSEMBLY	98 (220) X18
UPPER ROLLER ASSEMBLY	30 (66) X4
TRACK TENSION ASSEMBLY	325 (720) X2
SPROCKET + BOLTS	100 (220) X2
SWIVEL JOINT	58 (130)
TRACK GUIDE	50 (110) X 4
TRACK CHAINS W/900mm (35.4") SHOES	2,730 (6,006) X2
TRACK LINK	1,160 (2,560) X2
ATTACHMENT (STANDARD)	8,100 (17,860)
BUCKET ASSEMBLY [1.80M ³ (2.35 CU YD)]	1,440 (3,170)
ARM ASSEMBLY [3.45m (11' - 4")	2,380 (5,250)
ARM [3.45 11' - 4"]	1,450 (3,200)
BUCKET CYLINDER*	360 (790)
IDLER LINK	56 (120) X2
BUCKET LINK	150 (330)
PIN (2 PCS for mtg bucket cyl, & bucket	155 (340)
BOOM ASSEMBLY	4,240 (9,350)
BOOM	3,330 (7,280)
ARM CYLINDER*	590 (1,300)
PINS (mounting for arm)	124 (270)
FLUIDS	1,200 (2,650)
HYD OIL	570 (1,260)
ENG OIL	42 (90)
FUEL	540 (1,190)
WATER	48 (105)

* DRY WEIGHT


WARNING


**USE ONLY LIFTING DEVICES AND EQUIPMENT
WITH RATED CAPACITIES SUFFICIENT TO LIFT
THE SPECIFIC COMPONENT(S) BEING REMOVED
OR INSTALLED.**

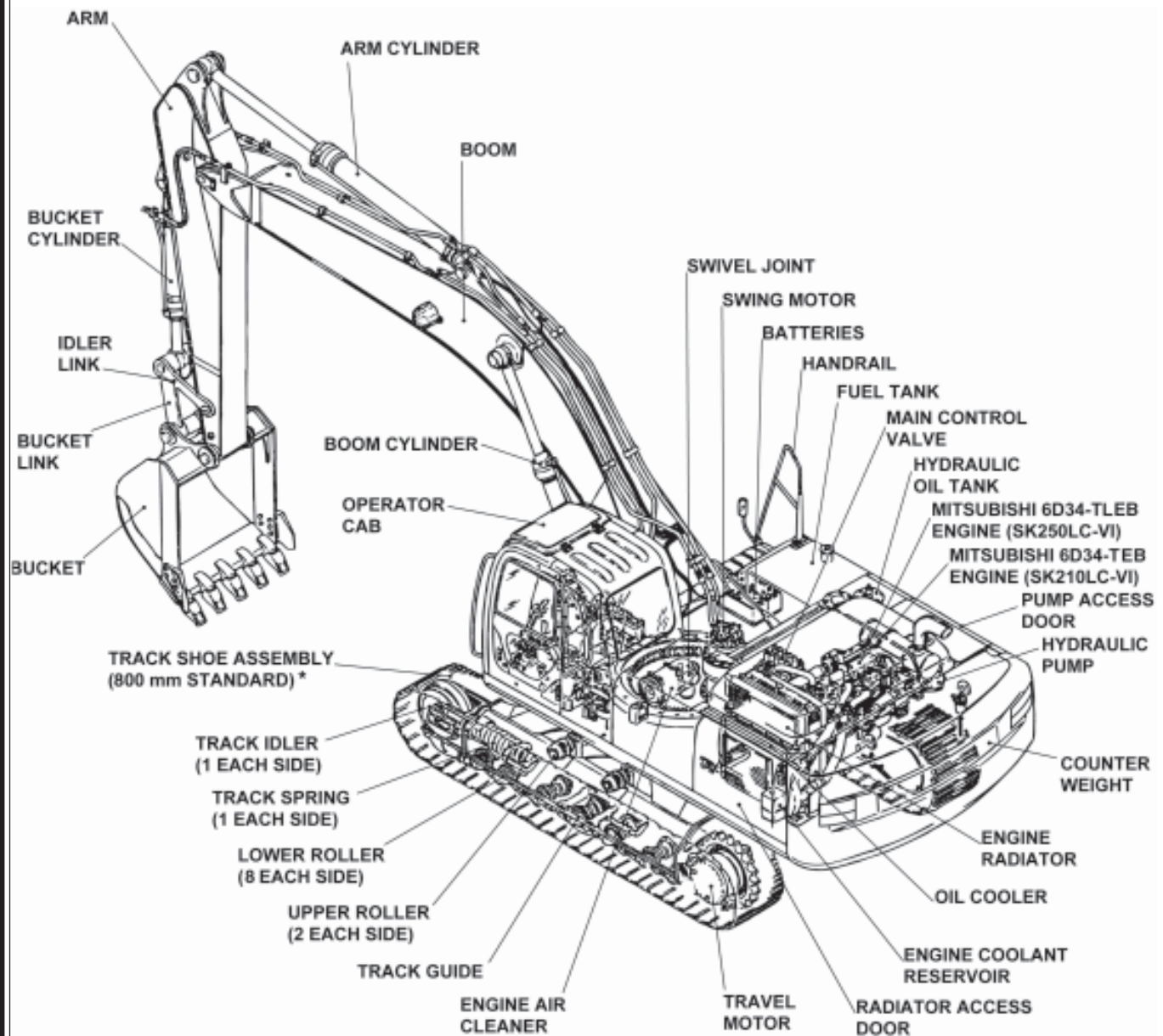
FAMILIARIZATION

All operators, service mechanics and personnel responsible for operation, inspection and maintenance of the machine should become thoroughly familiar with the controls and components and their functions before working with or on this equipment.

Study the information in this section to become familiar With the controls and components of this machine.

GENERAL MACHINE NOMENCLATURE

The Nomenclature drawing below (FIGURE 3.12), points out locations of major components of the KOBELCO SK210(LC)-VI Hydraulic Excavator. Study these areas and locate these components on the machine. Specific information regarding these components are explained on the following pages of this section.



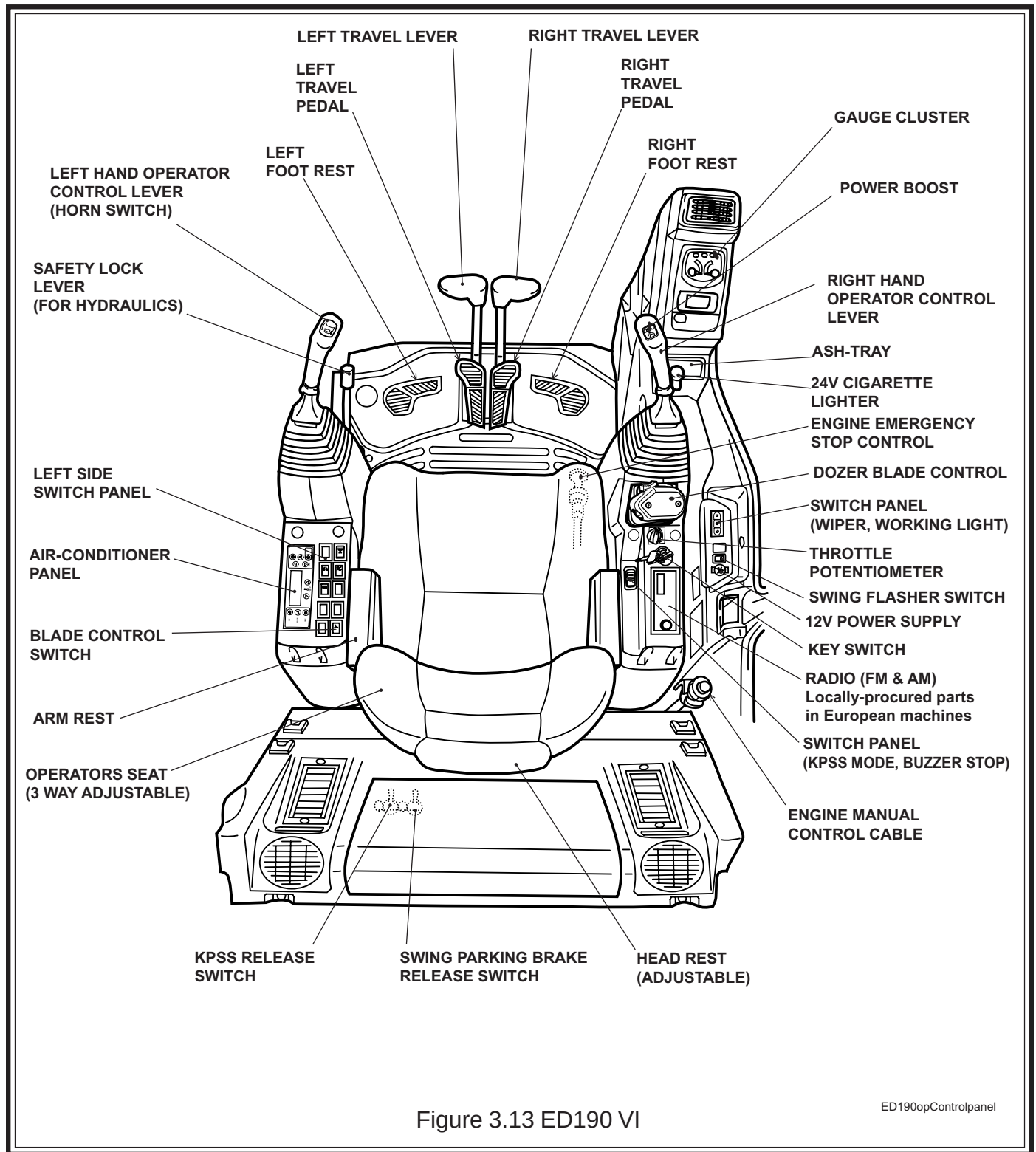
SK21002001

Figure 3.12 SK210 VI

OPERATOR CAB NOMENCLATURE

The operator cab nomenclature (FIGURE 3.13), points out the locations of operator controls of the KOBELCO ED190-VI Hydraulic Excavator operator cab.

Study these areas and locate these components on the machine. Specific information regarding these components are explained on the following pages of this section.



COMPONENT & CONTROLS NOMENCLATURE

The following information provides a brief description and function of the components and controls of the KOBELCO SK210(LC)-VI Hydraulic Excavator.

All personnel associated with this machine should read and understand this information BEFORE beginning any work with or on this equipment.

RIGHT HAND OPERATOR CONSOLE

1. Key Switch – FIGURE 3.14.a

The Key Switch is located on the right hand operator console and has 5 operating functions.

- “HEAT ”–This position is used for starting the engine in cold climates.
- “OFF ”–When Key is turned to this position, the engine stops and electrical power to the machine’s electrical systems is stopped after approximately 4 seconds.
- “ACC ”–With key in the “ACC ”position only the cigarette lighter, tuner and horn will have power.
- “ON”– When Key is in the ON position, electrical power is supplied to all the machine ’s electrical systems.
- “START ”–When key is turned to this position electrical power is supplied to the starter solenoid causing the starter to start the engine. After engine starts key should be released to go back to the “ON ” position.

2. KPSS Mode Switch – FIGURE 3.14.b

The KPSS Mode Switch SK160~SK480 is located on the right hand operator console and has 3 operating functions. After starting the engine, the mode switch defaults to the **M** for maximum power. The operator can select an effective work mode complying with the working conditions and working target from 3 modes. Each time the work mode switch is pressed, the work mode indicator lamp is switched from **M**, to **A**, then to **B** in that order.

NOTE

SK480 **A** Assist mode reduces engine and pump yield to approximately 90% of maximum output.

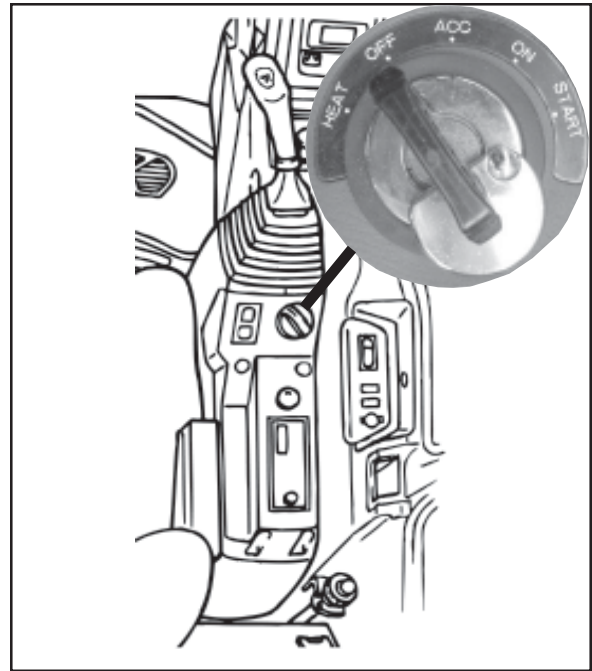


FIGURE 3.14.a

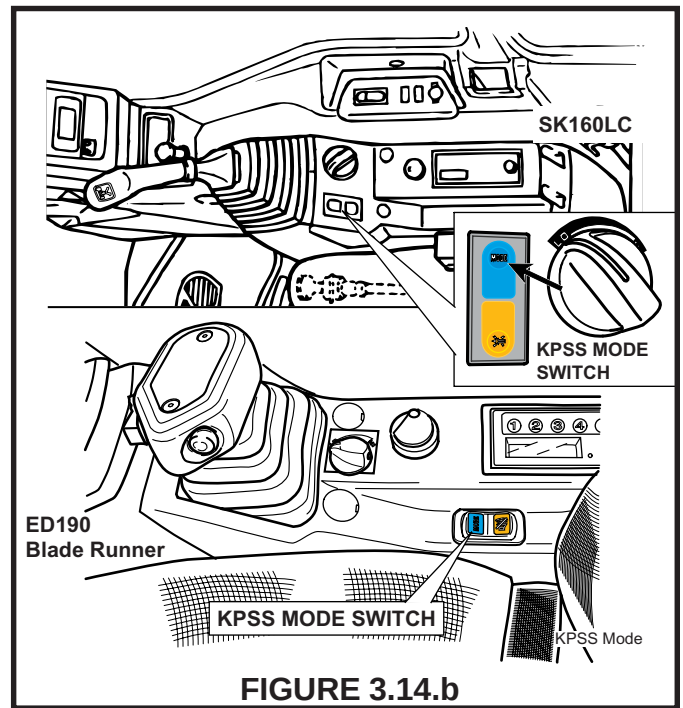


FIGURE 3.14.b

NOTE

To clear fault codes on the ED190 press the travel speed change switch and the buzzer stop switch at the same time. The new rocker switch for the Mode/Buzzer Stop switch makes it impossible to press both switches at the same time.

a. M (Manual) mode



This mode senses the movement of control lever and is suitable for the heavy load digging work giving priority to the work load at high speed.

b. A (Assist) mode SK160~SK330

 Pressing the work mode selector switch once changes to “A” or assist mode, located on the left of the three indicator lamps. The mechatro controller analyzes the operator’s pattern of joystick lever movement, and uses “fuzzy logic” to set one of five machine operating parameters FIGURE 3.15.a

Results	Control Mode (Contents on multidisplay
Simple digging, ditch digging, trench box digging	 DIGGING
Leveling, slope finishing	 LEVELING
Spreading	 SPREADING
Tamping	 TAMPING
Traveling, waiting time	 STANDBY

FIGURE 3.15.a

Once the mechatro has analyzed the operators joystick pattern, a moving graphic FIGURE 3.11.b (icon) flashes on the message display of the monitor screen to show the operator which assist mode is selected. Control is made easier as the machine uses this pattern to “ASSIST” in setting adequate pump and engine operation. Operating efficiency increases FIGURE 3.15.c without the operator even noticing.

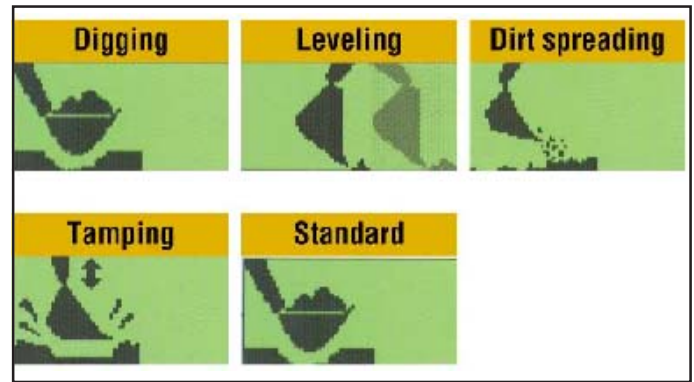


FIGURE 3.15.b

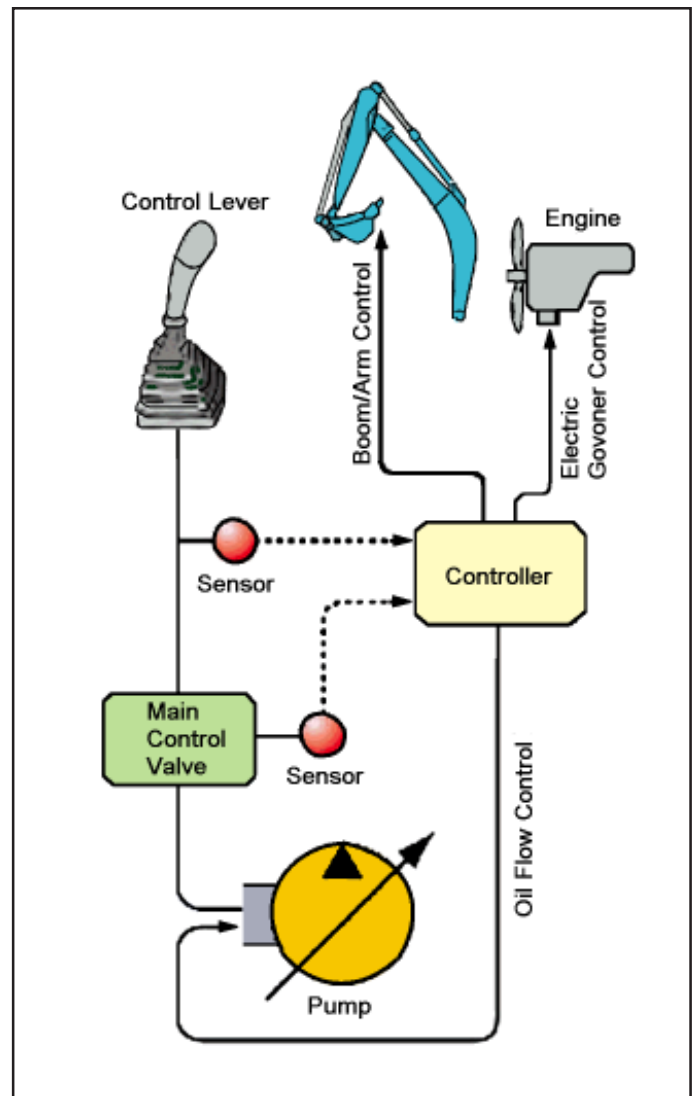


FIGURE 3.15.c

c. Breaker mode



Pressing the work mode selector twice from "M" mode, changes the machine to "B" or breaker mode. Located on the right of M mode. See FIGURE 3.16.a. The purpose of this mode is to allow the operator to quickly adjust the pump flow rates for various attachments while sitting in the cab. When the breaker or attachment is in operation the flow volume is switched automatically to the operators preset pump flow. The flow returns to normal setting when the breaker or attachment is not being used.

NOTE

The breaker flow is not set at the factory to deliver maximum pump flow. To change the flow rate to a higher or lower setting see the following information. "Gauge cluster will display pump flow in metric units only."



WARNING



Do not operate this machine unless you have read and understand the instructions in the OPERATORS MANUAL. Improper machine operation is dangerous and could result in injury or death.

1. With Safety Lock in the up or lock position, place keyswitch to on position, do not start engine. See FIGURE 3.16.b
2. Press the mode switch two times, the LCD screen will display the set flow rate of the breaker circuit. See FIGURE 3.17.c.
3. To change the pump flow (both pumps are changed SK160 and up) move machine to safe work area and turn keyswitch to off. Wait ten seconds then procede.

Minimum / Max flow rate adjusting procedure

1. Preparation
 - a. Keyswitch must be in off position for ten seconds.
 - b. Turn keyswitch to on position do not start engine, place safety lock in up position.
 - c. Press mode switch twice to select (B) Breaker mode.

KPSS WORK MODE LAMP

SCREEN CHANGE SWITCH



FIGURE 3.16.a

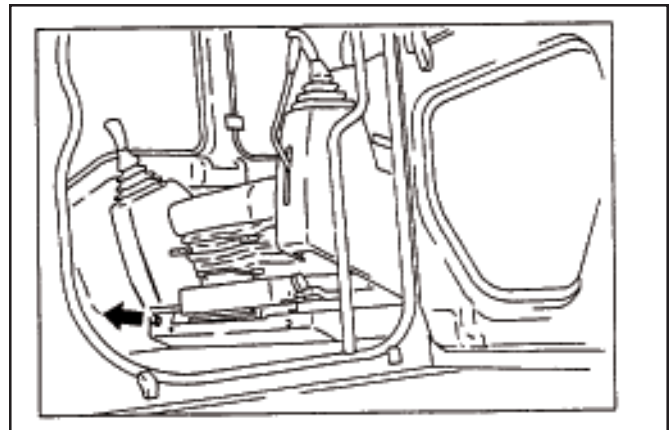


FIGURE 3.16.b

NOTE

It is impossible to adjust flow rate after starting of engine.

Step A-Max./Min. flow rate adjusting procedure

- d. Press the screen change switch for 5 ~ 10 seconds and release. See FIGURE 3.16.a the LCD screen displays the flow rate stored in memory.
- e. Press the mode switch once, see FIGURE 3.17.b flow rate value will increase in 10L/ min. increments. If mode switch is held down for more than five seconds, flow rate will increase rapidly. Release mode switch when you have reached your desired value.

Continued on next page -

Min/Max flow rate adjustment - Cont.

- f. Press the buzzer stop switch once, see FIGURE 3.17.c. flow rate value will decrease in 10L/min. increments. If buzzer stop switch is held down for more than five seconds, flow rate will decrease rapidly. Release buzzer stop switch when you have reached your desired value.
- g. Press the screen change switch to store the new flow rate value.

NOTE

If keyswitch is turned off before pressing the screen change button and returning LCD screen to OK new values will not be saved.

Press mode switch in breaker flow rate adjustment will increase flow.

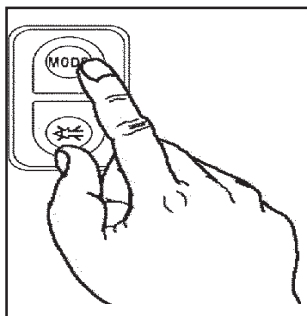


FIGURE 3.17.a

Press buzzer switch in breaker flow rate adjustment will decrease flow.

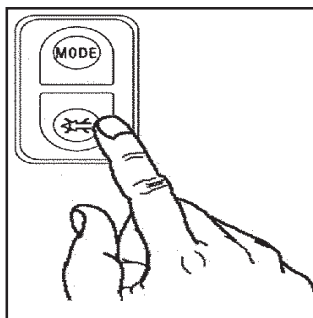


FIGURE 3.17.b

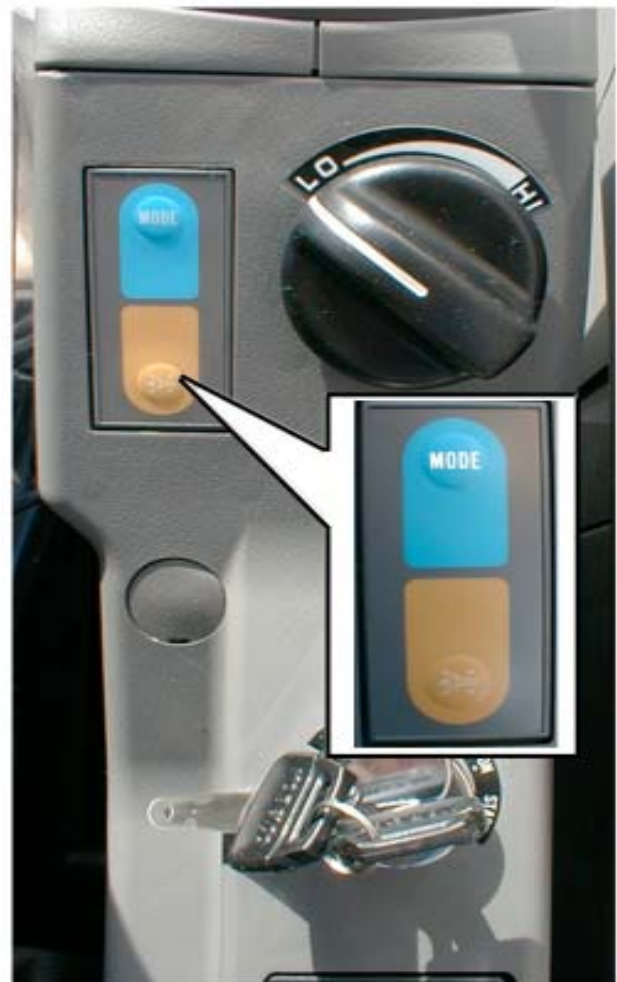


FIGURE 3.17.c

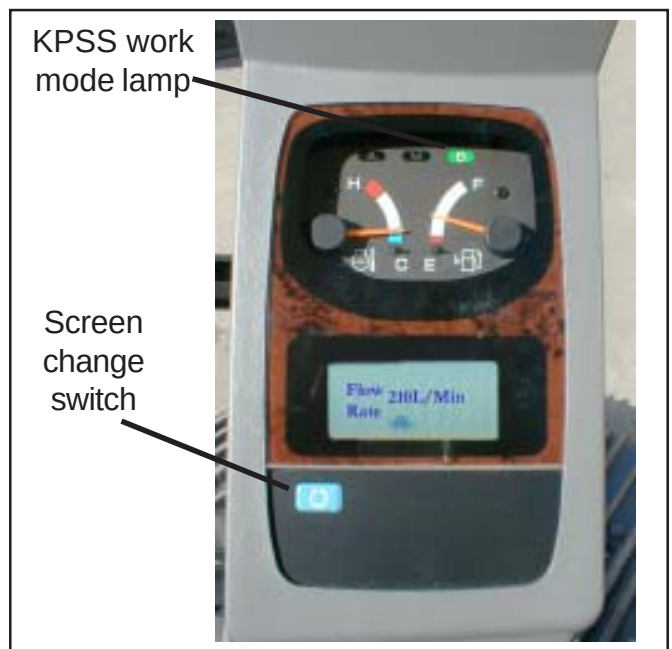


FIGURE 3.17.d

Maximum / Minimum VR1 override Protection - Pre minor change SK160~SK480 only

Located inside the mechanro controller on the main circuit board is a trimmer dial VR1 which will override the screen preset flow setting procedures. Not only will this feature provide protection for equipment in "A" or "M" modes, it can also be used to dial in flows less than which is stored in memory of "B" mode.

This Flow control protection can be used to protect "auxiliary hydraulic circuit" but will not limit main excavator boom, arm, bucket swing or travel speed. Only the auxiliary attachment flow is controlled through the setting. See FIGURE 3.13.d.

Proper Adjustment thru the VR1 trimmer is achieved by installing a proper flow meter in Series with the auxiliary attachment and after the proper axillary attachment pressure has been adjusted thru that circuit's relief cartridge then insert a small flat blade screwdriver into the VR1 trimmer and adjust either clockwise or counter clockwise for increased or decreased pump flow.

Note: Machine is shipped from the factory with the VR1 trimmer set between 30%~ 95% of flow.

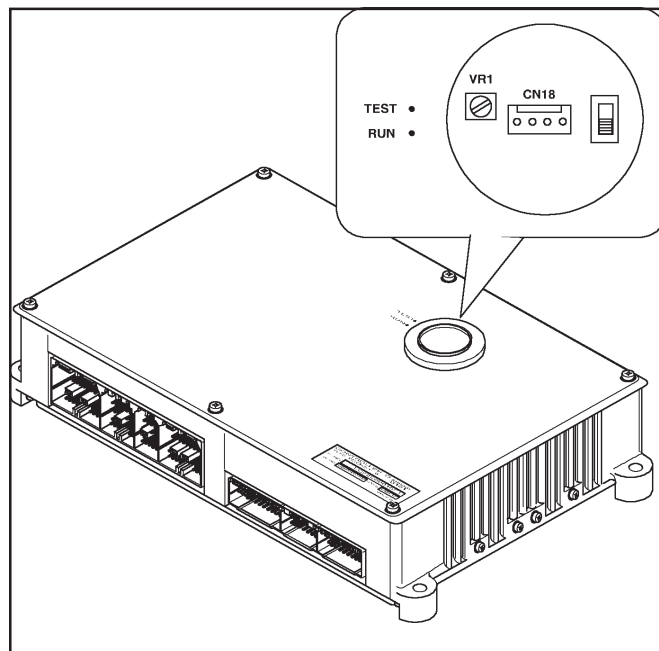
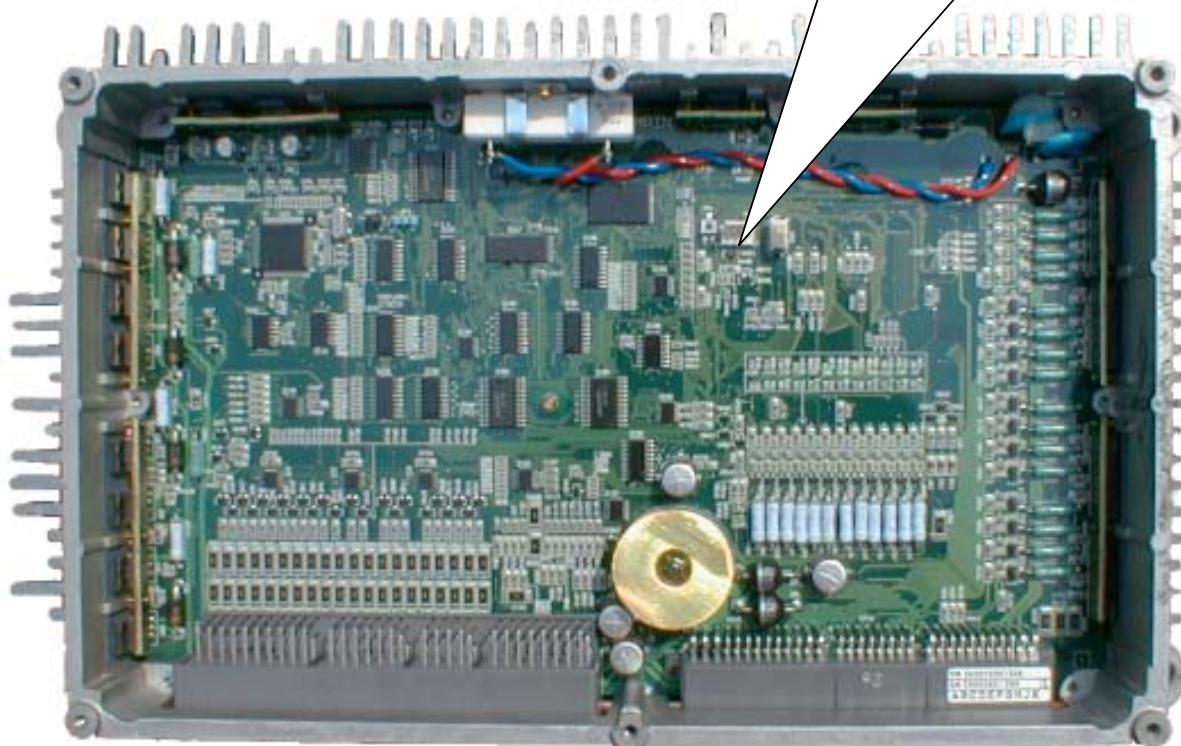
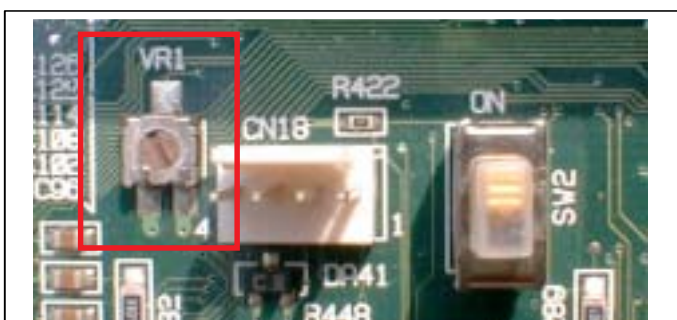


FIGURE 3.13.d



3. Buzzer Stop Switch – FIGURE 3.18.a



When the engine coolant temperature is too high, or various sensors of mechatro controller (self-diagnosis) fail, the alarm sounds intermittently. To stop the sound, press the buzzer stop button.

NOTE

- Buzzer sounding due to engine cooling water temperature rise can not be stopped.
- The buzzer sounding, because the preheat complete and E/G oil pressure are displayed, stops by turning the key switch OFF.

4. Throttle Potentiometer – FIGURE 3.18.A

The throttle potentiometer's located on the right hand operator console and controls engine RPM. When the throttle potentiometer is rotated to right or left position it increases or decreases engine rpm and maintains engine at the programed RPM for that particular position on the dial.

NOTE

In operation, when all pilot controls are in the neutral position for more than three seconds, and the engine RPM is above 1050, the auto excel reduces the engine speed to 1050.

Manual Auto Accel Over ride Procedure:

Auto accel release condition

1. Place the safety lever in the up and lock position.
2. Located the one pin connector for the auto acceleration function behind the operators right hand console see FIGURE 3.18.b.
3. Change the position of the connector as in indicated in FIGURE 3.18.b.

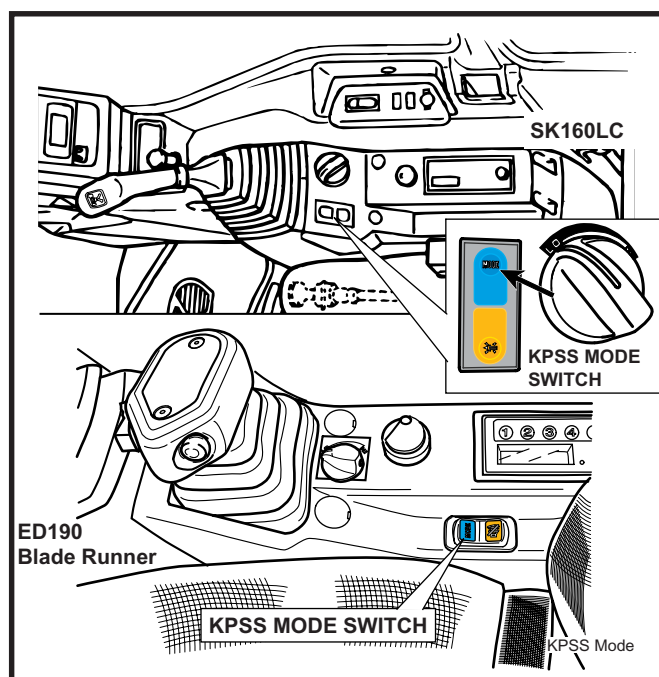


FIGURE 3.18.a

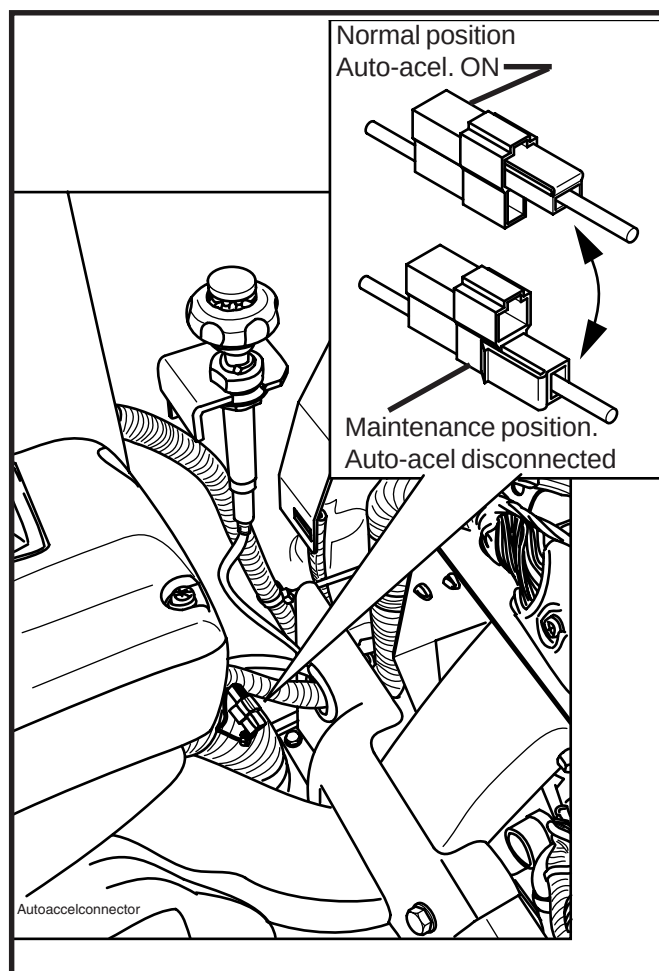


FIGURE 3.18.b

5. Wiper & Washer Switch - FIGURE 3.19.a



Press this switch, and the front widow wiper starts moving.

- Press it once : Wiper moves intermittently.
- Press it again : Wiper moves continuously.
- Press it once more : Wiper stops moving.



CAUTION



Make certain the washer reservoir has washer fluid before operation washer.
See FIGURE 3.15.c



Press this switch, and washer fluid is sprayed while it is pushed. The washer fluid reservoir is located behind the cab, in the air cleaner compartment. See FIGURE 3.19.b



FIGURE 3.19.a

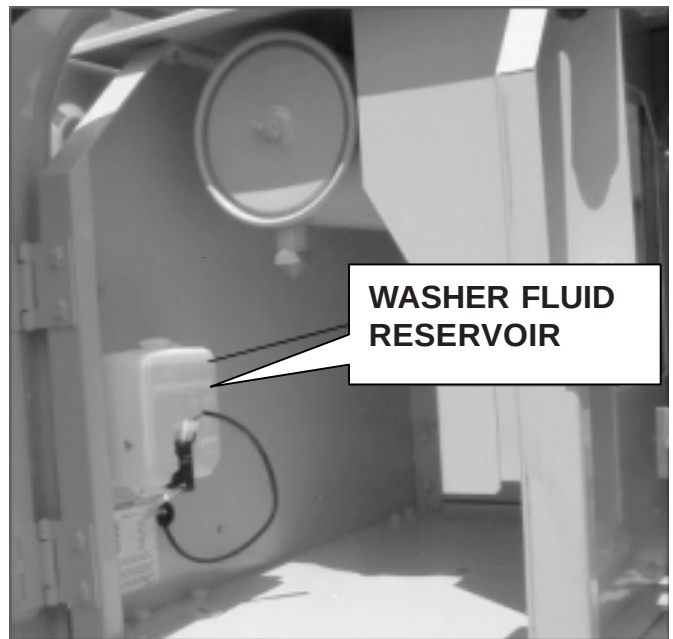


FIGURE 3.19.b

6. Working Lights Select Switch – FIGURE 3.19.c



– This light selector switch illuminates whenever the ignition switch is placed in the “ON” position and the working lights are activated.

- Press switch once: The frame and boom working lights come on and the symbol “F”  displays on the lower side of the LCD screen.
- Press it again: The rear working lights come on and the symbol “R”  displays on the lower side of the LCD screen.
- Press light selector switch again and the frame, boom and rear work lights go out.



FIGURE 3.19.c

D8. Dozer Control Lever (ED190-VI)

The dozer control lever (1) is located on the operator's right side console, See Fig. 20.a.

To operate the dozer, it is necessary to activate the dozer circuit by pressing the Dozer Switch located on the operator's left side console, See Fig. 20.b

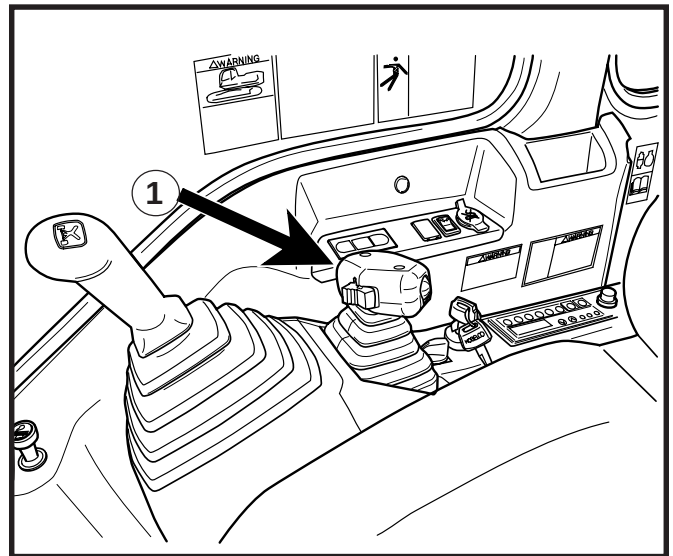


FIGURE 20.a

The dozer control lever is multifunctional, See Fig. 20.c

- a. "FORWARD"—Variable speed for blade lowering.
- b. "BACKWARD"— Variable speed for blade raising.
- c. "CENTER"— Hold position.
- d. "LEFT"— Variable speed for blade right tilt.
- e. "RIGHT"— Variable speed for blade left tilt.

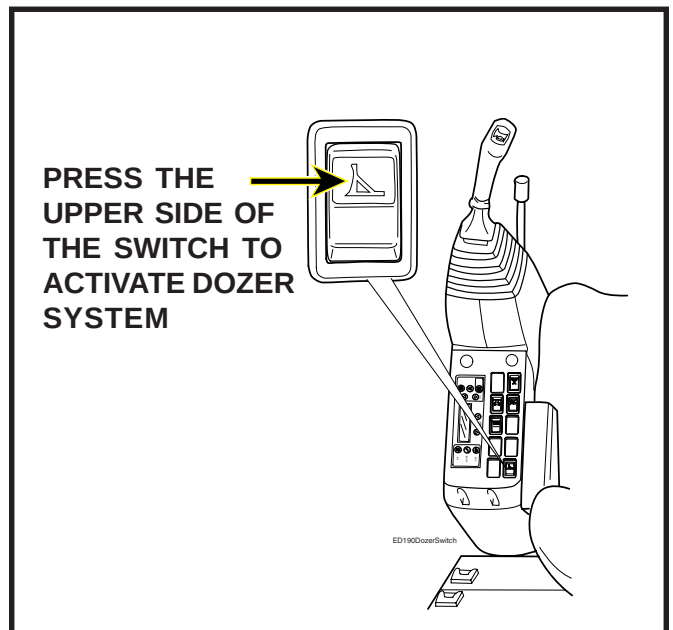


FIGURE 20.b

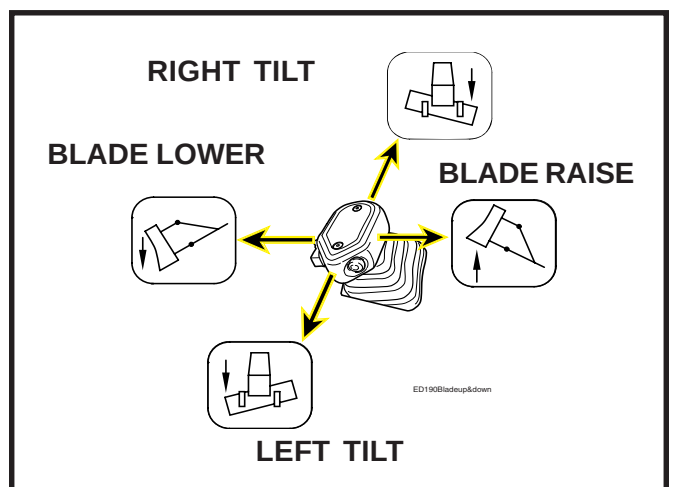
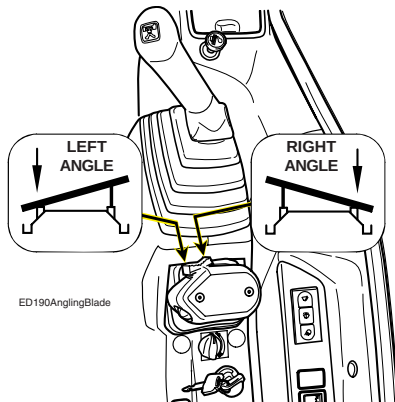


FIGURE 20.c

Two switches are located on the dozer control handle:



the blade toward the right. See Fig. 21.a

FIGURE 21.a

2. Dozer Blade Float Control Switch: It is located on the left side of the dozer control handle. Depress this switch to make the blade float, See Fig. 21.b. Pull back the dozer control lever to disengage the float function.

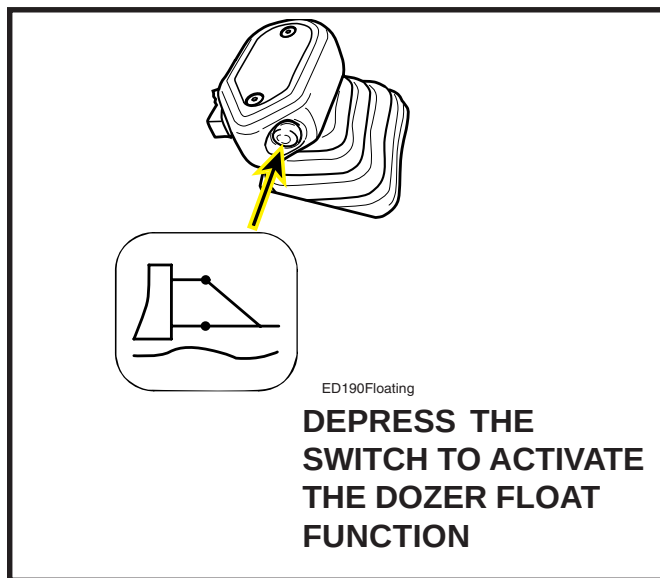


FIGURE 21.c

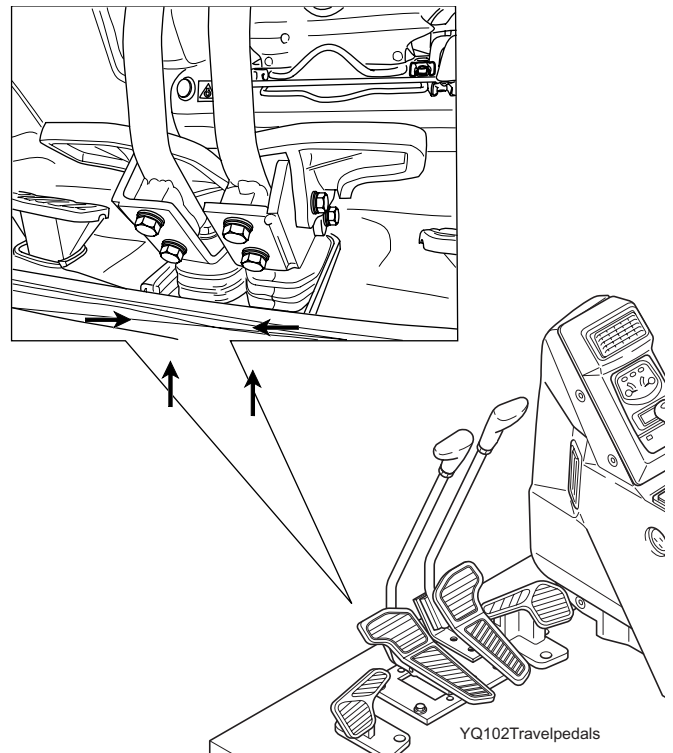


FIGURE 21.d

D9. Removing the Travel Control Levers

- Use a 13 mm wrench to remove the travel control levers from the travel pedals, See Figure 21.d.
- Use a 17 mm wrench to remove the support brackets located in the air cleaner compartment, See Figure 21.e.
- Store the travel control levers properly in the air cleaner compartment and securely tighten the brackets.

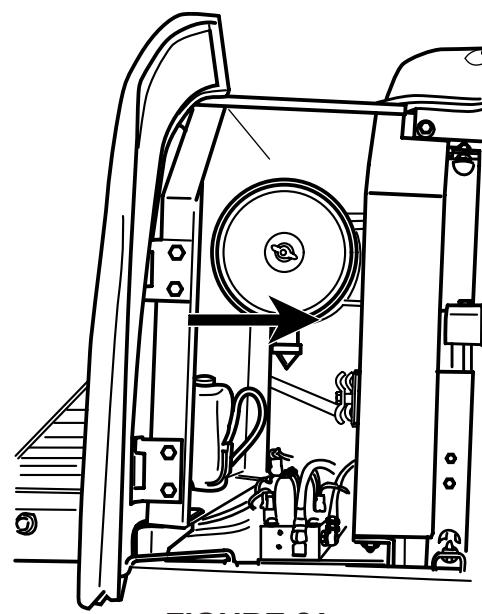


FIGURE 21.e

7. 24Vdc Radio – FIGURE 2.7C

The radio is located on the right side control panel as indicated in FIGURE 3.16.a. The LCD Display shows the radio station selected as well as its frequency band.

a. Control Switches

The following table describes the different functions available to use the radio:

Switch	FUNCTION AND USAGE
1	Power switch and volume
2	Control
3	Tone control
4	FM & AM selector
5	Station selection
6	Preset Selector buttons
7	LCD display
8	Time adjusting buttons

b. How to select stations Figure 3.16.b

1. How to select a radio station manually: Press the Power switch to turn on the radio and press the station selector buttons up or down to select the desired radio station. This radio functions on two main frequency bands: AM and FM. When the frequency band reaches the upper or lower limit, the radio automatically switches to the opposite limit, that is: from the upper to the lower or vice versa.
2. How to preset the radio stations: Once the desired radio station is selected manually, press any of the preset station buttons (1–6) for more than 1.5 sec to record it in its respective memory. The reception is temporarily lost during the memorization process. Once the reception is recovered, the station is preset on the desired preset station button. Repeat this procedure to preset a total of 6 different radio stations.

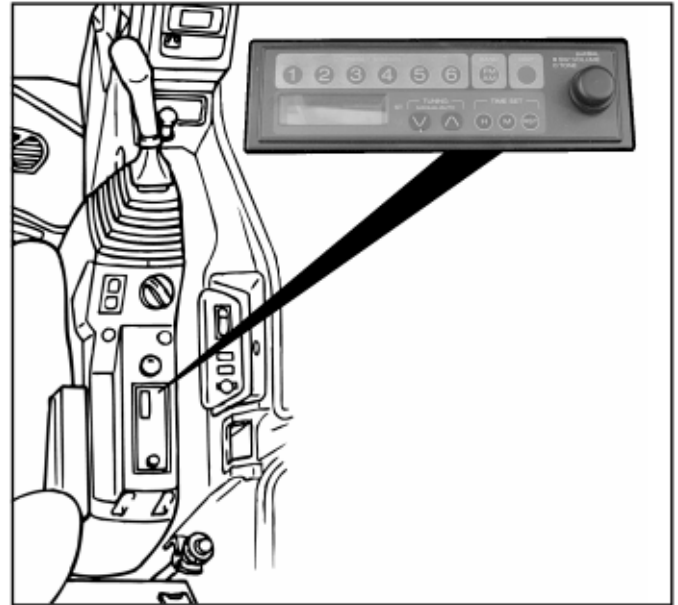


FIGURE 3.16.a

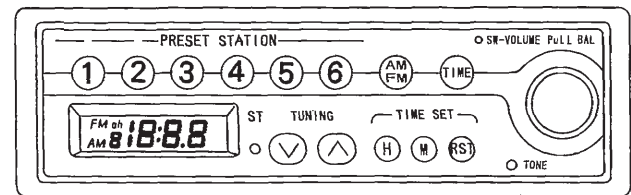


FIGURE 3.16.b

NOTE

The preset stations are canceled when the radio is removed for maintenance.

8. 24 Volt Cigarette Lighter – FIGURE 3.17.a

The cigarette lighter is located on the right wall of cab. To use the cigarette lighter the key switch must be in the ON position. Push the lighter in and wait approximately 30 seconds for it to “POP ” out. Pull lighter from the socket to use. Replace lighter back into its socket after use.

Do not use the cigarette lighter as a power source for 12 volt accessories. It is 24 volt outlet. Plugging a 12 volt accessory into a 24 volt connector may result in shorting & or Fire.

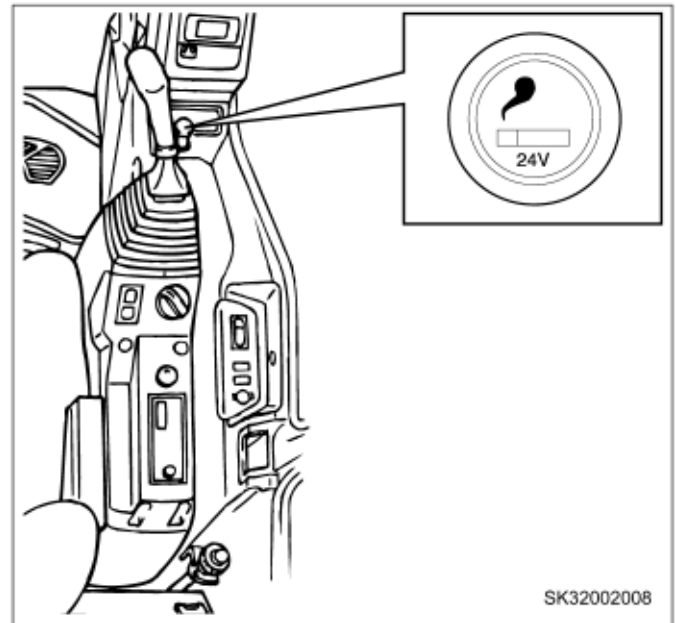


FIGURE 3.17.a

 CAUTION 
Do not use the cigarette lighter as a power source for 12 volt accessories. It is a 24 volt outlet. Plugging a 12 volt accessory into a 24 volt connector may result in shorting or fire.

9. Swing Flasher Switch – FIGURE 3.17.b

The swing flasher switch is located on the right hand operator console. The swing flasher is a 2 position rocker switch which is used to turn on the swing flashers.

“ON ” – Push the symbol side of switch down to turn swing flashers ON.

“OFF ” – Push the empty side of switch down to turn swing flashers OFF.



FIGURE 3.17.b

LEFT HAND OPERATOR CONSOLE

1. Climate Control Air Conditioner FIGURE 3.17a and 3.17.b

The climate control-AC provides a comfortable indoor environment and adjustable control of cab temperature. It removes moisture from humid air and reducing window glass fogging. The climate control-AC is installed behind operator 's seat and sends cold air or hot air into cab.

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.

AC - Fundamental Use – FIGURE 3.18.b

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

- 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.
- Select proper mode manually through recirculate and fresh air capacity selector switch and compressor switch ON – OFF.
- Select preferable fan speed manually through fan speed selector switch when fan speed,selected through auto control, isnot preferable. The indicator lamp of AUTO " n LCD display goes out. Press "AUTO "switch to return to automatic climate control.

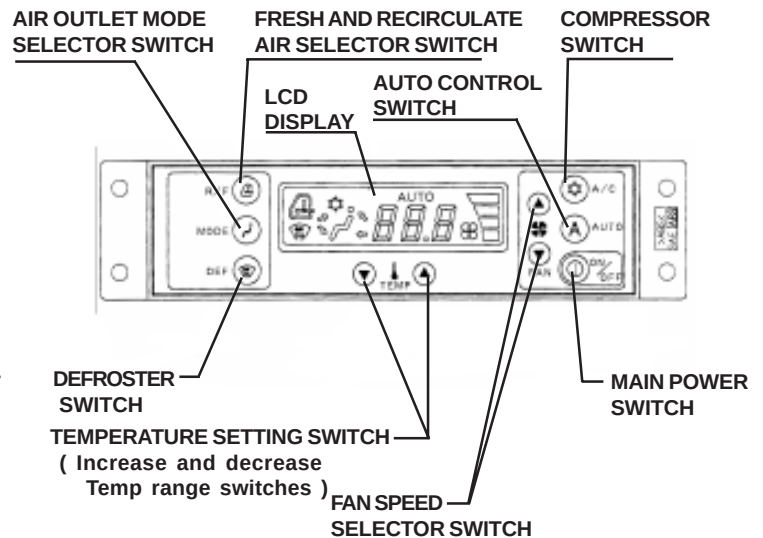


FIGURE 3.18.a

Changing Display Value – FIGURE 3.18.a

The user is able to change the display values between ° C (Celsius) and ° F (Fahrenheit) by pressing the Red arrow and Blue Arrow buttons on the display panel for 10 seconds and then releasing buttons.

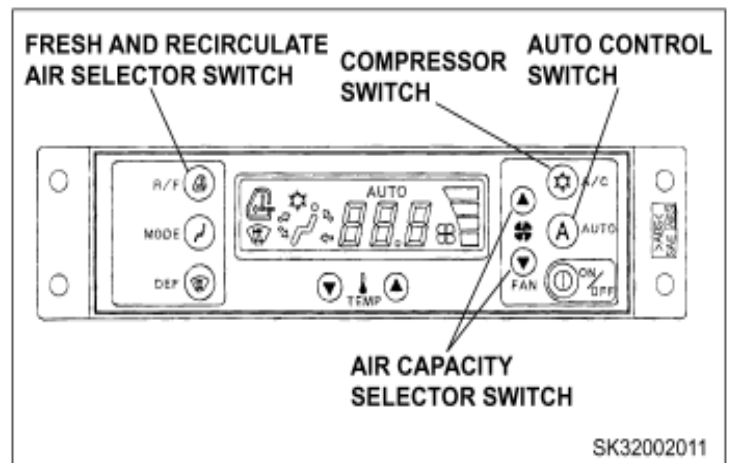


FIGURE 3.18.b

Control Panel Functions

Main Power Switch and Display FIGURE 3.18.a

- LCD display is illuminated when the climate control-AC is operating. When the climate control-AC is stopped, LCD will be turned off.
- Press main power switch, and all functions for the climate control-AC switch ON or OFF.
Each time when this switch is pressed, the function switches ON and OFF. When switched ON, the climate control-AC starts operating at the point set before switching OFF (When it is set to AUTO, auto mode; if NORMAL is selected, then in normal mode).

NOTE

The key switch will switch air-conditioner OFF, but the operating condition just before switching off may not be restored when the key switch is turned ON again.

Auto Control Switch and Display FIGURE 3.19.b

- Press the main power switch to activate the climate control-AC and the LCD display will illuminate.
- Press control switch AUTO, and fan speed and air outlet are automatically controlled, and "AUTO" indicator lamp on LCD display is illuminated.
- When the main power switch is OFF, the system will retain the previous setting in memory. Therefore, when the main power switch is pressed again, the climate control AC will come on in the auto control mode. In the Auto mode, the fan speed and air outlet openings are operated automatically.

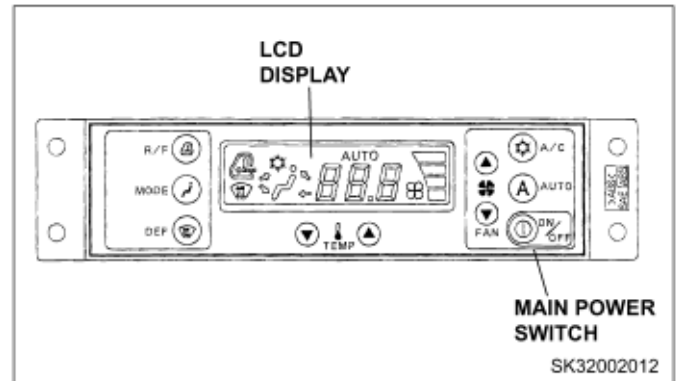


FIGURE 3.19.a

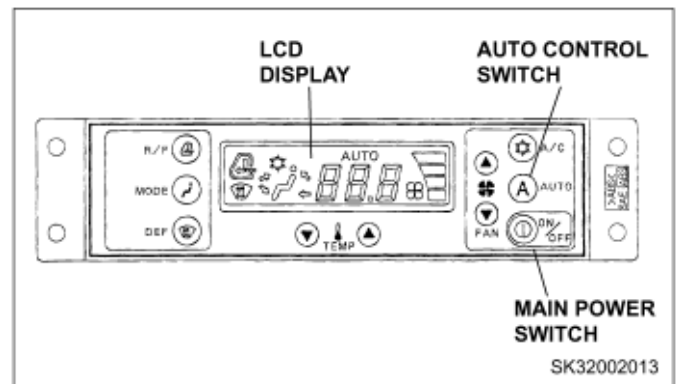


FIGURE 3.19.b

Temperature Setting Switch and Display FIGURE 3.20.a

- a. The set temperature is indicated indigits on LCD display. Temperature set range is 18.5 °C (65.3 °F) to 31.5 °C (88.7 °F).
- b. Press the two temperature set switches simultaneously for 5 seconds to change the display from Centigrade (°C) to Fahrenheit (°F) or viceversa in the LCD display. (Eg.) 5°C (77 °F) or (77 °F) 25 °C.
- c. Press temperature set switch DOWN or UP to change the set temperature. The temerature goes up or down by 0.5 °C (0.9 °F) in graduation.
- d. The set temperature 18 °C (64.4 °F) is the lowest cooling temperature, and 32 °C (89.6°F) is the highest heating temperature. Control beyond either of these limits is not possible.

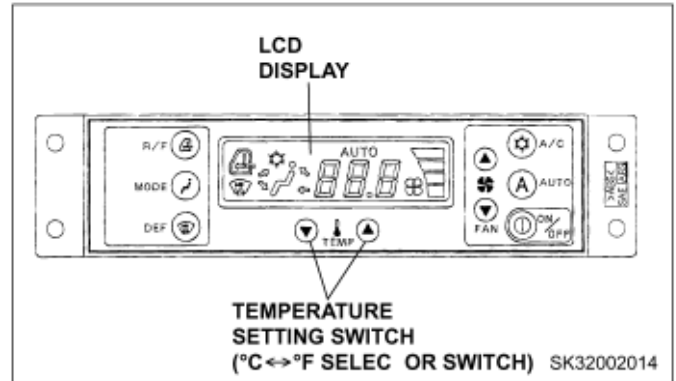


FIGURE 3.20.a

Air Outlet Mode Selector Switch and Display FIGURE 3.20.b

- a. Air outlet position is indicated by the arrow on LCD display.
- b. Press Air Outlet Mode Switch in the condition where auto display light is on, and the display mode is fixed. "AUTO" indicator lamp on LCD display goes out, and "AUTO" control of air outlet opening is released. Press it again, and the level s changed to:
VENT → BI-LEVEL → FOOT → FACE.

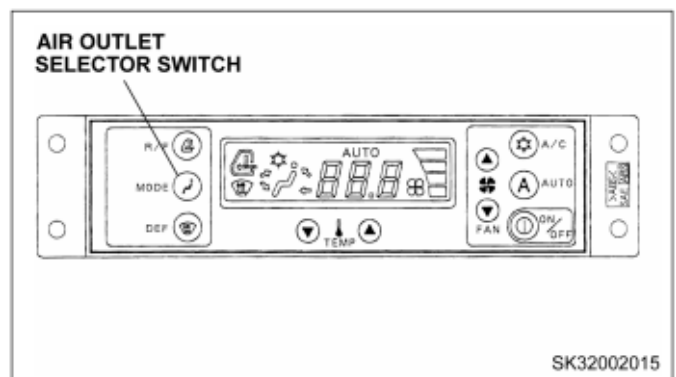


FIGURE 3.20.b

LCD display				
Air outlet opening	Vent	Bi-level	Foot	Face
Air outlet direction	Upper half of body	Upper half of body, foot	Foot, front glass	Upper half of body (Front)

Defroster Switch and Display FIGURE 3.21.a

- a. Press Defroster Switch, defroster indicator lamp will be displayed.
- b. Press Air Outlet Mode Selector Switch, and it returns to air outlet mode just before pressing defroster switch.
- c. Press Defroster Switch in the condition where AUTO display is lighting up, "AUTO" indicator lamp on LCD display goes out and the auto control of air outlet opening is released.

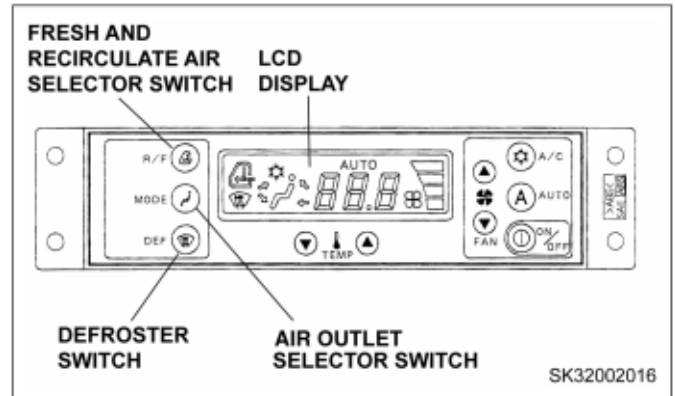


FIGURE 3.21.a

Recirculate and Fresh air Selector Switch and Display – FIGURE 3.21.a

- a. Suction (fresh air intake) mode is indicated on LCD display.
- b. Each time recirculate and fresh air capacity selector switch is pressed, the mode is switched to air recirculate or fresh air intake.

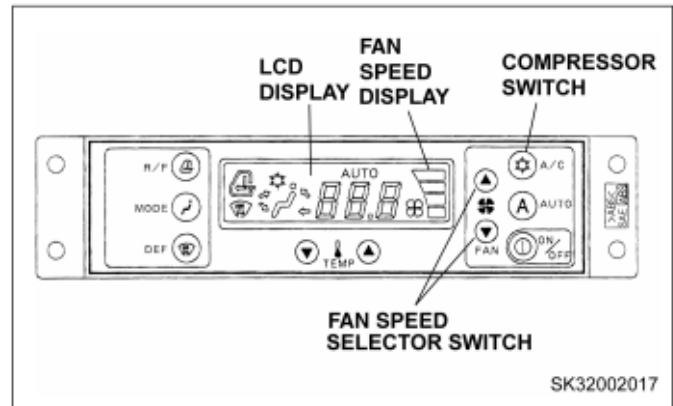


FIGURE 3.21.b

Compressor Switch and Display –FIGURE 3.21.b

Press compressor switch in the condition where mark on LCD display is unlit, compressor starts operating and indicator lamp of mark on LCD display goes on.

Press it again, and compressor turns off, and indicator lamp of mark on LCD display goes out.

Air Capacity Selector Switch and Display FIGURE 3.21.c

When it is set to MANUAL mode, fan speed on LCD display is as follows.

LCD display				
Fan speed	LOW	MEDIUM	HIGH	MAX.

SK32002018

FIGURE 3.21.c

Display	Fan speed
LCD 4 lamps are lit up.	MAX.
LCD 3 lamps are lit up.	HIGH
LCD 2 lamps are lit up.	MEDIUM
LCD 1 lamp is lit up.	LOW

Press UP or DOWN of fan speed selector switch, and auto control of fan speed is released, and "AUTO" indicator lamp on LCD display goes out.

5. Air Conditioner Filter location

The air conditioning system has a single stage filter that cleans the incoming air before it reaches the cab, this filter is removed by removing the plastic panel behind the operators seat (figure3.21a).

Removal:

The filter is removed by simply grabbing the top pull tab of the filter (figure 3.21d) and pulling upward out of the housing.

Installation:

The filter is slid into the filter housing by simple dropping in to filter housing and pressing down into place. (Figure 3.21C)



FIGURE 3.21.a



FIGURE 3.21.b

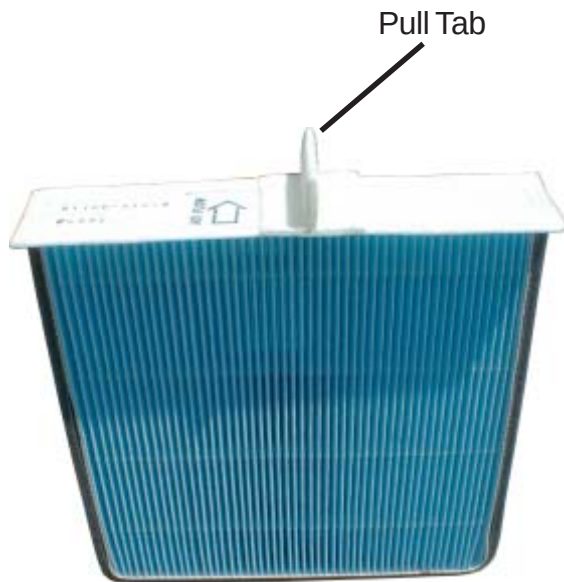


FIGURE 3.21.d



FIGURE 3.21.c

AC Unit Filter Inspection

Inspect the fresh air filter every 250 hours of engine operation and the recirculate air filter every 500 hours of engine operation.

NOTE

- If the working environment is extremely dusty, it is recommended to reduce the inspection schedule to at least half of the above specified working hours.
- The fresh air filter is a paper filter. **DO NOT WASH.** Clean with air only. Do not clean more than 10 times, or replace it every 2 years.
- Clean the recirculate air filter with compressed air or by washing and rinsing.
- Do not wash recirculate air filter with any organic solvent, such as: gasoline, trichlene, thinner, etc.

Removing the climitizer-AC unit filters:

1. Fresh Air Filter

- Move the seat back forward for easy access to the rear panel.
- Release the 4 top screws from the rear panel top cover (behind the operator's seat), see Figure 4.39A, and press the lower locks to release cover and remove it. Tilt the cover towards the seat to obtain access to the fresh filter. See Figure 4.39B.

NOTE

To release the 4 top screws, turn them counter-clockwise 1/4 of a turn (90°).

- Remove the fresh air filter for inspection and cleaning, or replacement. See Figure 4.39B.
- After cleaning or replacement, use this procedure in reverse for assembling.

2. Recirculate Air Filter

- Repeat above steps a, and b.
- Pull out the speaker wires and carefully remove the top cover from the cab.
- Press the locks on the lower cover to release it and remove it to obtain access to the recirculate air filter. See Figure 4.39A.
- Raise recirculate air filter slightly and pull it out for inspection and cleaning, or replacement. See Figure 4.39C.
- After cleaning or replacement, use this procedure in reverse for assembling.

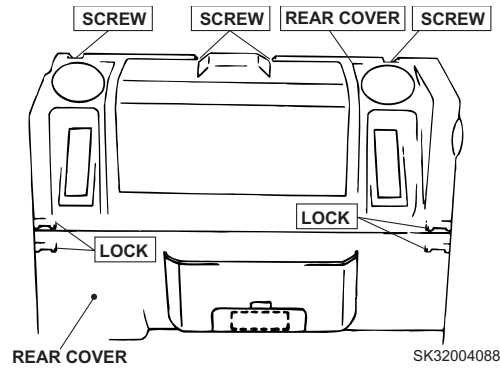


FIGURE 4.39A

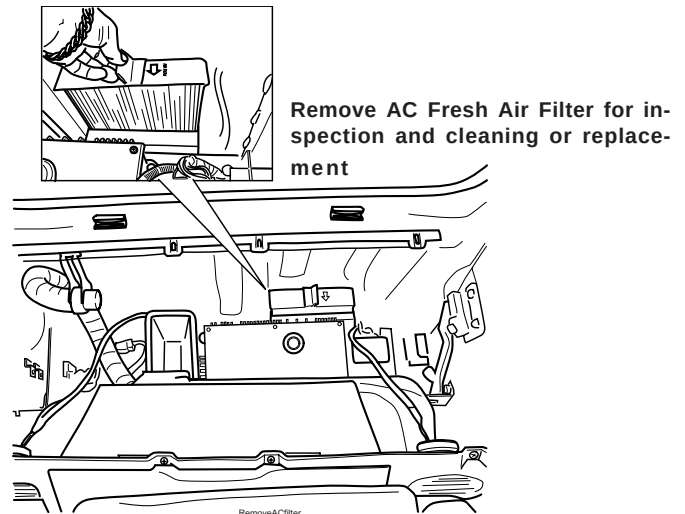


FIGURE 4.39B

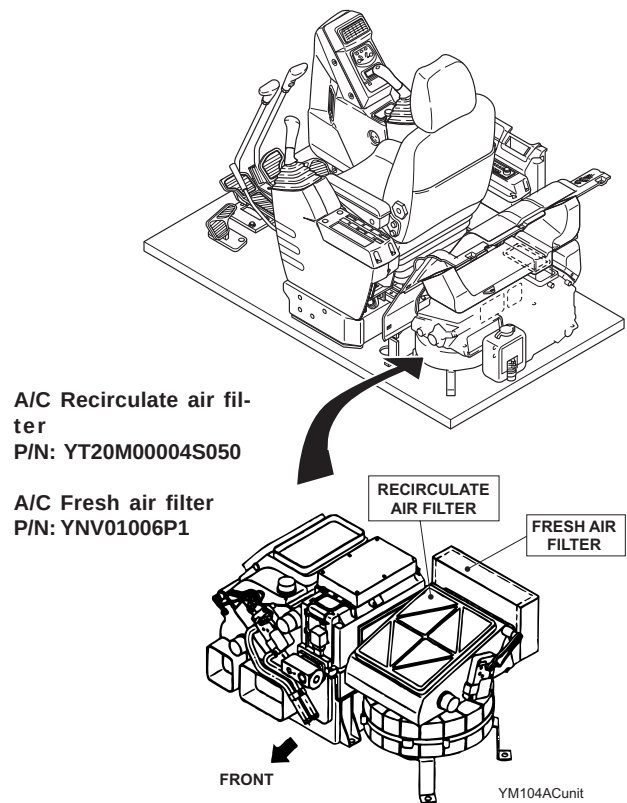


FIGURE 4.39C

2. Auto Warm Up System-FIGURE 3.28.a

To activate warm up mode:



- Keyswitch must be in the off position
- Activate warm up switch
- Start engine

Once engine is started mechatrol sets engine RPM to (1050) and "WARMING UP" is displayed.

NOTE

When the accel dial set value is set lower that 1050 RPM engine speed returns to the speed set by the throttle potentiometer

Warming up of hydraulic oil

In this operation, "WARMING UP" is displayed on the multidisplay.

- a. After warming up the engine, the computer sets the pump flow rate at a fixed flow for 3 minutes at E/G speed 1,050 rpm.
- b. Next the flow rate is increased for 5 minutes at E/G speed 1,600 rpm.
- c. The neutral cut valve is closed, engine RPM is increased to 1,600 and flow is set for 5 minutes.
- d. Hydraulic pumps are set to maximum flow, for 10 minutes at E/G speed at auto accel speed.

Finishing warming up

- a. Auto warming up is competed after about 26 minutes.
- b. Or in case where the pilot hydraulic oil temperature switch (installed on the tank port of solenoid proportional valve block senses the temperature of 50 °F (10 °C) or higher.
- c. Once the computer program is stopped "WARM FINISH" is displayed on L C D buzzer stops 5 seconds later.

NOTE

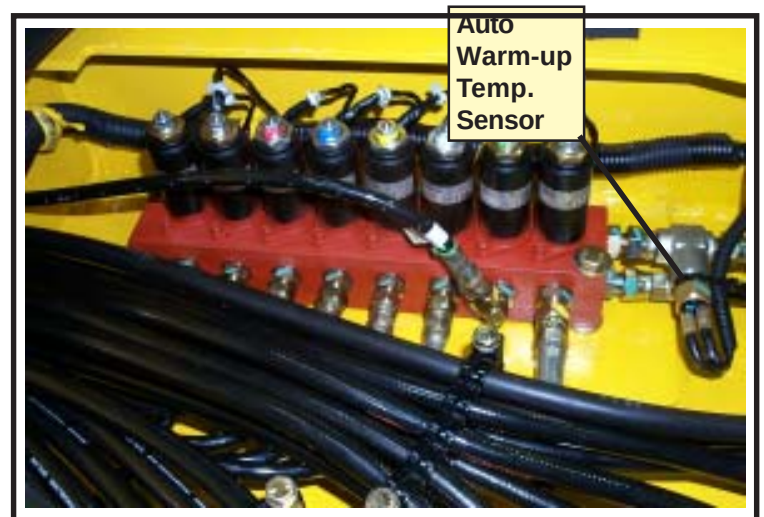
Auto warming up can be stopped at anytime by turning switch to off position



FIGURE-3.28.a

SK210 Shown for Reference

⚠ CAUTION ⚠
Auto warm-up should be utilized anytime machine is started in climate temperatures below 10 °C (50 °F) to stabilize machine control response. Cold oil can cause erratic machine operation.



3. Travel Speed Select Switch FIGURE 3.29.a



The travel speed select switch is located on the left hand control console. The travel speed select switch is a single position, dual function rocker switch and is used to increase or decrease travel speed. Each time engine is started, travel speed is automatically set to 1 () speed.



.....Low First Speed

Set to LOW when moving the machine on a rough or soft road, slope, or in a narrow place, or when powerful tractive force is required, or loading or unloading from a truck trailer.



..... High 2nd Speed

Set to HIGH when moving the machine on flat, hard ground.


WARNING


DO NOT USE HIGH () SPEED WHEN PERFORMING DELICATE OPERATIONS SUCH AS PIPE LAYING, FINE GRADING OR LOADING MACHINE ONTO A RAILER. DO NOT CHANGE TRAVEL SPEED WHILE LOADING, MACHINE COULD BECOME UNSTABLE AND CAUSE SERIOUS INJURY, EQUIPMENT DAMAGE AND/OR DEATH.



FIGURE-3.29.a

TRAVEL SPEED
SELECT SWITCH

SK210 Shown for Reference

4. Independent Travel Switch - FIGURE 3.29.a



The independent travel select switch is located on the left hand control console. See Figure 03-27.a Use the function where fine metering of attachment operations and travel operations are required.

Travel control levers /pedals must be in the neutral position before activation switch.

NOTE

The ED190 uses the travel speed change switch with the new rocker switch for the Mode/Buzzer Stop switch to clear fault codes.

5. Heavy Lift Switch – FIGURE 2.30.a



The heavy lift switch is located on the left hand control console. The heavy lift switch has 2 operating functions. The heavy lift function is used when precision control of heavy lifting operations is required.

- “ON ”– Push the symbol side of switch down to turn heavy lift function on.
- “OFF ”–Push back of switch down to turn heavy lift function Off.



DANGER



NEVER TURN OFF HEAVY LIFT SWITCH DURING ANY HEAVY LIFTING OPERATION. SUDDEN OR UNEXPECTED LOAD MOVEMENT COULD RESULT IN SERIOUS INJURY OR DEATH.



FIGURE 3.30.a

SK210 Shown for Reference

REAR PANEL AND OTHERS

1. Swing Parking Brake Release Switch

FIGURE 3.30.b

After removing 4 cover set screws on the rear side of operator seat, release the locks (5 places) of cover section, and remove the upper cover exposes switch. Swing parking brake is normally in the locked position. The swing parking brake is released in swing and arm in operation. When the swing function becomes inoperable due to a malfunction, turn toggle switch to “RELEASE LOCK” position, and the parking brake will be released. Move machine to a safe area immediately and contact an authorized Kobelco Dealer’s Service Department for assistance. Return the toggle switch to “NORMAL” position after repairs are completed.

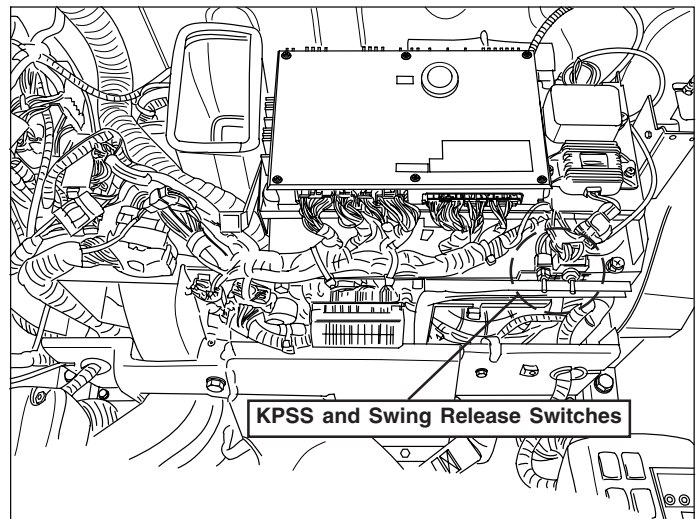


FIGURE 3.30.b

(Note: With the swing parking brake in release position machine will not “Free Swing” as control valve swing spool is still closed, machine will just drift more on slope during static operation.)

SK480 & MC SK330 Engine Diagnosis Lamps (Red and Amber) – FIGURE 2.29.A, 2.29.B

Two diagnosis lamps are installed on the left side control panel as indicated in the figure. These lamps will indicate any abnormality in the engine. Refer to the following tables for normal and abnormal condition of the engine:

Normal engine condition

	Key Switch "ON"	Key Switch "During and after Starting engine"
Red lamp	ON	OFF
Amber lamp	ON	OFF
Condition	Normal	Normal

NOTE 1

During normal conditions, both lamps will illuminate as soon as the key switch is turned to the "ON" position, and will stay illuminated until the engine is started. Lamps will turn Off, and will stay Off after starting the engine.

Abnormal engine condition

	Key Switch "ON"	Key Switch "ON"	Key Switch "START"
Red lamp	ON (Flashing)	OFF or ON (Flashing)	OFF or ON (Flashing)
Amber lamp	OFF	OFF or ON (Flashing)	OFF or ON (Flashing)
Condition	Engine does not start	Engine starts	Engine starts

NOTE 2

There exists two different abnormal conditions:

- » The red and/or amber lamps will illuminate and flash the engine failure code(s) (See Figure 2.29.B for details on flashing codes). Engine not running mode.
- » The red and/or amber lamps will illuminate and flash the engine failure code(s) (See Figure 2.29.B for details on flashing codes). Engine running mode.

If abnormal conditions appear on engine, refer to Chapter 10 Mechatronics Section for more details on Engine Failure Codes.

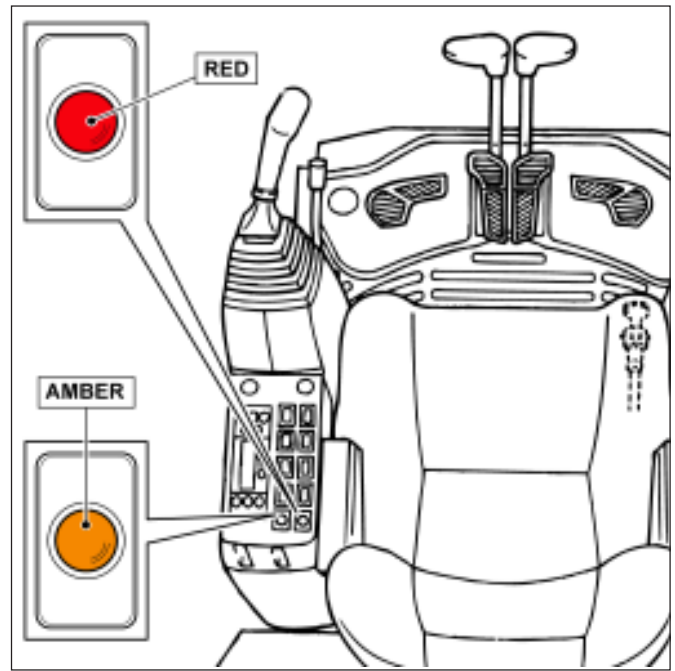
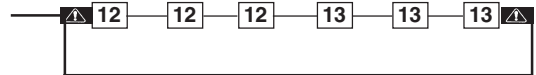


FIGURE 2.29.A

NOTE 3

The code is indicated by a 2 figure number: the code's first figure lights on for 1.2 seconds and off for 1.2 seconds, and the code's second figure lights on for 0.4 seconds and off for 0.4 second, as shown in Fig. 2.16B. Every code is displayed three times repeatedly, and where there is no more code, the display will return to the first code.

Therefore, in the case where codes 12 and 13 are present:



NOTE: This example shows failure code 12

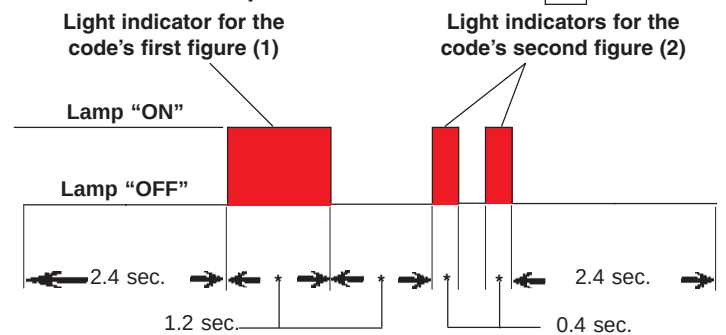


FIGURE 2.29B

NOTE 4

If one of the engine diagnosis lamps (Red or amber) does not illuminate as soon as the key switch is set to the ON position, check for defective light bulb.

2. KPSS Release Switch – FIGURE 3.32.a

When the LCD screen displays “CPU MECHATRO CONT.FAIL”, proceed as follows:

- a. Stop the engine.
- b. Remove the covers for the control panel located behind the operator’s seat:
 - b1. Turn the top 4 screws CCW 90 ° to unlock them, press the lower locks to release the cover. Disconnect the speaker wires and remove the top cover.
 - b2. Press the lower locks to release the bottom side of the lower cover. Then remove cover.
- c. Locate the switches for the KPSS release and the swing parking brake release switch and flip them to their release position.
- d. Install the covers.

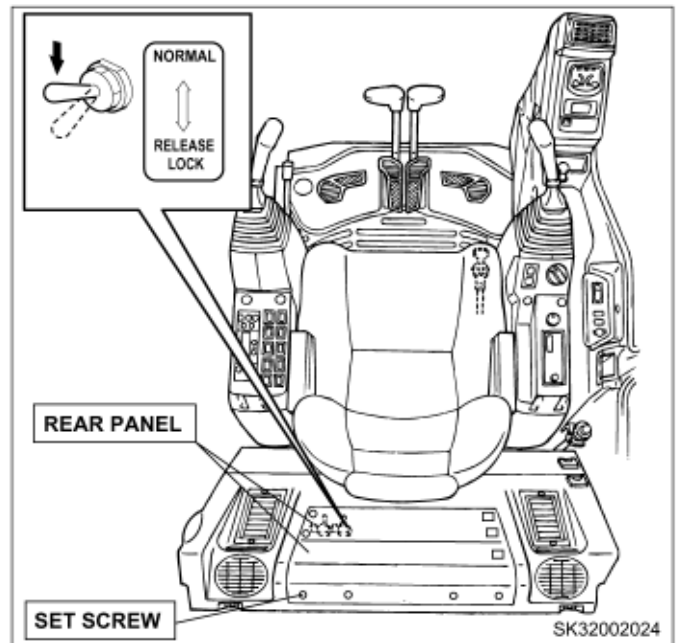


FIGURE 3.32.a

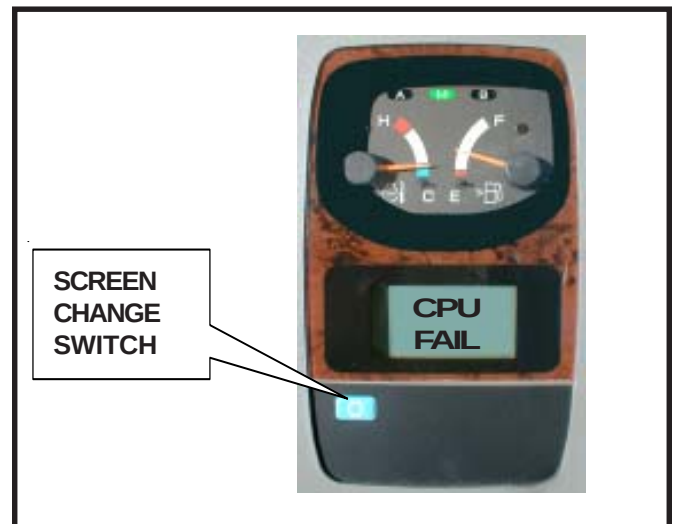


FIGURE 3.32.b

Manual Throttle Cable – FIGURE 3.32.b

This mechanical system is used to control the engine speed manually if the electronic system fails to operate properly.

- a. When the LCD screen displays “STEP MOTOR S/PT ERROR ” and the engine speed can’t be controlled normally, press the button at the center of the knob and simultaneously pull the cable control to raise the engine speed to high idle condition.
- b. When the LCD screen displays “CPU MECHATRO CONT.FAIL.” and the engine speed can’t be controlled normally, proceed as follows:

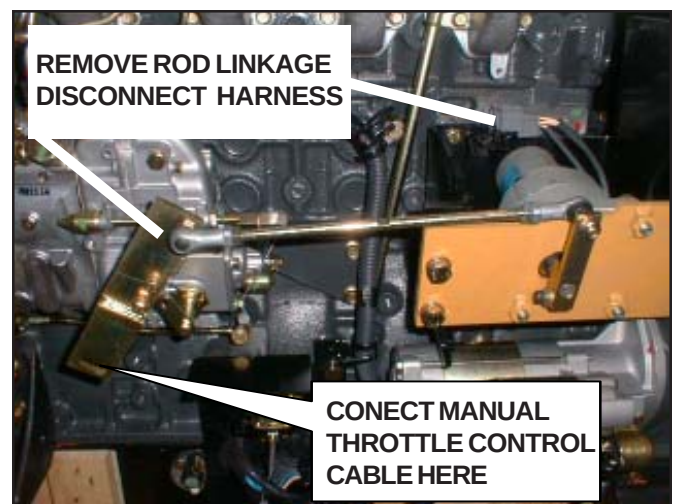


FIGURE 3.32.c

3. Installation of Manual Throttle Cable SK160 through SK330 (pre-M/C) Only.

If the stepping motor is damaged or has lost communication to the CPU, it is possible to have manually control of the diesel injection pump from the operators cab.

1. Stop the engine.
- a. Go to the engine compartment
- b. Remove the linkage between the stepping motor and injection pump.
- c. Install the manual throttle cable which is standard on most Dynamic Acera excavators. **(Pre M/C Only)** See FIGURE 3.32.c.
- d. if computer has failed the the KPSS Switch must be changed to the release position, if only the stepping motor has fail leave the switch in the KPSS position.(see kpss switch adjustment below for this adjustment.)

4. KPSS Release Mode.

- a. Remove the covers for the control panel located behind the operator 's seat:
- b. Locate the switches for the KPSS release and the swing parking brake release and flip them to their release position.
- c. Install rear panel covers.
- d. Start the engine.
- e. Press the button at the center of the manual throttle knob and simultaneously pull the cable control to raise the engine speed to high idle condition.

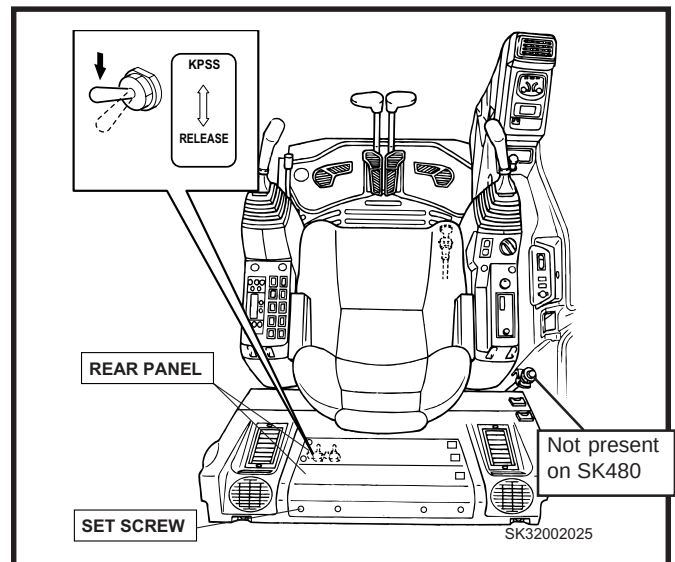


FIGURE 3.33.a

NOTE

Manual throttle control cable is not present on the SK480 Dynamic Acera with Mitsubishi 6D24-TLAB

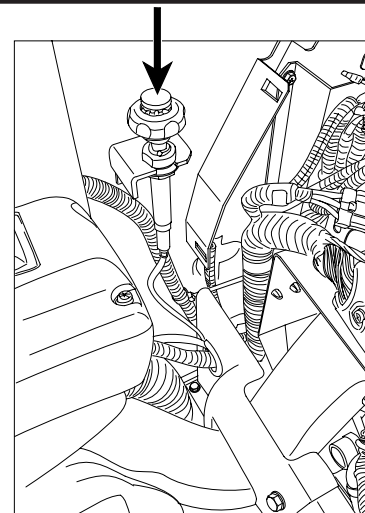


Figure 3.33.b.

NOTE

If the mechanical throttle is used when the KPSS system has no problem, then the stepping motor may be damaged as well and the main C-1 Controller and the machine 's performance will be very erratic. The error code 31 will show on the panel and the machine will not shut down through the ignition key. Set the ignition key to the OFF position and pull the engine emergency stop control to shut off the engine. Make sure the mechanical throttle is disengaged before restarting the machine.

Pump Regulator Back-up Function. (Except SK160/ED190)

Hydraulic Back-up

- If “MECHATRO CONT. FAIL” or “STEP MOTOR S/PT. ERROR” are displayed on the machine’s gauge cluster multidisplay, the machine cannot be operated normally or electronic or physical failure of the pump proportional solenoids **PSV-1 & PSV-1 Hydraulic Backup** function will have to be engaged.
- The machine is equipped with back-up function to actuate the hydraulic pumps. The following procedure will allow the hydraulic pump to operate at 90% capacity enabling continuous work.(as long as main C-1 computer is functional if controller must be shut down then work rate is about 65%.)
- **Procedure to engage back-up function of pump regulator.**
 1. Stop the engine.
 2. Locate each psv (portional solenoid valve) and unplug the electrical connector(s) of the failed solenoid valve to prevent further damage to the controller.
 3. Locate each manual back set screw head (4.5mm). Loosen the lock nuts(13mm) of two back-up screws on the P1 & P2 regulators. See Figure 3.34.a & Fig. 3.34.c
 4. Turn the back-up screws counterclockwise out with a wrench until they stop.
 5. Retighten the lock nuts.
 6. If computer is still functional and PSV-1 and PSV-2 have just been unplugged start work normally, if the controller has failed then the installation of the manual throttle cable will have to be made to operate the machine at correct engine RPMs. See next page for installation of manual throttle cable.

NOTE

Not Available on SK160/ED190

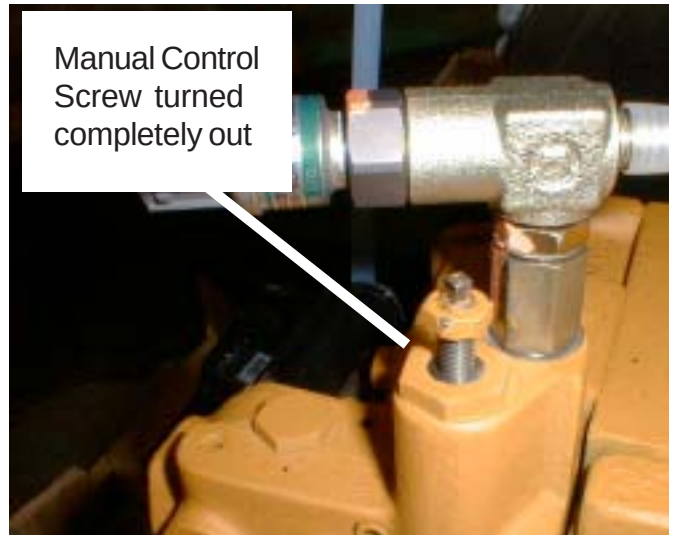


Figure 3.34.a.

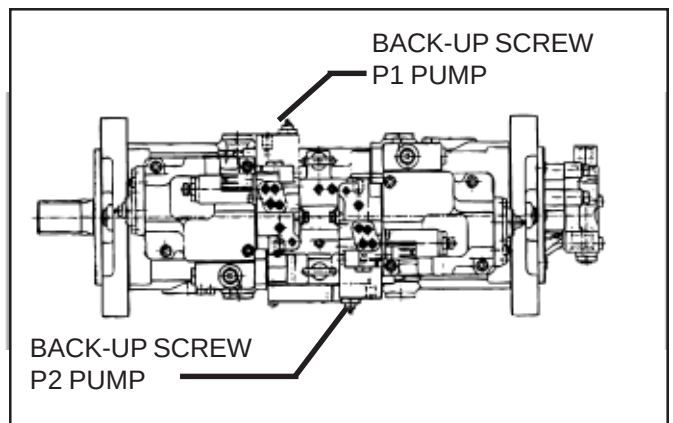


Figure 3.34.b.



Figure 3.32.c.

Back-up function - cont.

Installing Manual Throttle Cable (Pre M/C)

1. Place throttle at low idle. Start the engine.
2. To increase engine speed, press the center button of engine control knob, and simultaneously pull cable control to raise the engine speed to to be maintained.
 (See Figure 3.35.a)
3. Resume working
4. After finishing the work, press the center button of engine control cable and concurrently push down the knob, and the engine speed returns to low idling.
5. Stop the engine by pulling the emergency stop cable, then turn off the keyswitch.

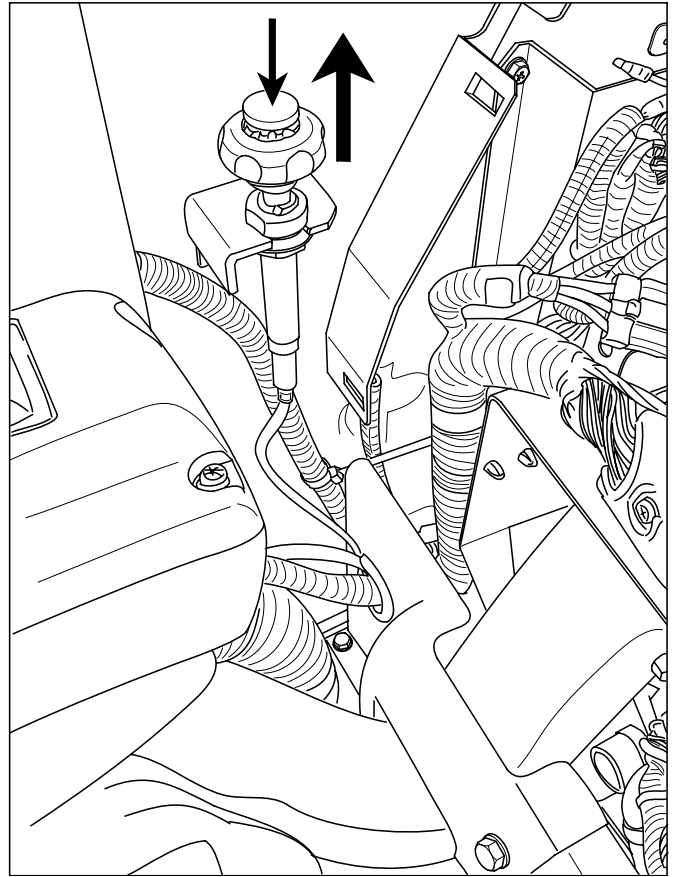


Figure 3.35.a.

NOTE

1. The fuel level and engine water, work lights, wiper, air-con, radio, etc. on the cluster gauge function rely on the C-1 Controller to function in normal condition. With out the **C-1** controller function, operate machine with caution and watch engine and hydraulic conditions.
2. Machine function is performed at almost 90% the same level as when in the normal condition with the controller.
3. The backup functioning time has only slight effect on the performance of the machine, but inspection and repair are required to correct the trouble.
4. Should gauge cluster display fail, the fuel level and E/G water temperature are not indicated, also other cluster gauge function are not possible.
5. Also, for the failure shown in Item 4, it may cause trouble with daily operation, so immediate inspection and repair are required.
6. When the hydraulic pump is set to the backup function, the control of KPSS work mode switch is not required.

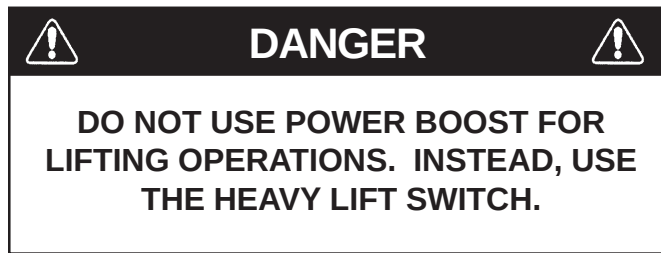
NOTE

The above manual throttle assembly is not available on the SK480.



3. Power Boost Switch – FIGURE 3.36.a

Located on the right hand control lever, this switch should only be used for increased break out force during digging.



NOTE

Use of power boost is prohibited with arms longer than 2.94 M (9' 8") {SK210(LC)–VI}, and 2.98 M (9' 9") {SK250(LC)–VI} is installed. Contact your Kobelco dealer for instructions on how to disconnect the power boost function.

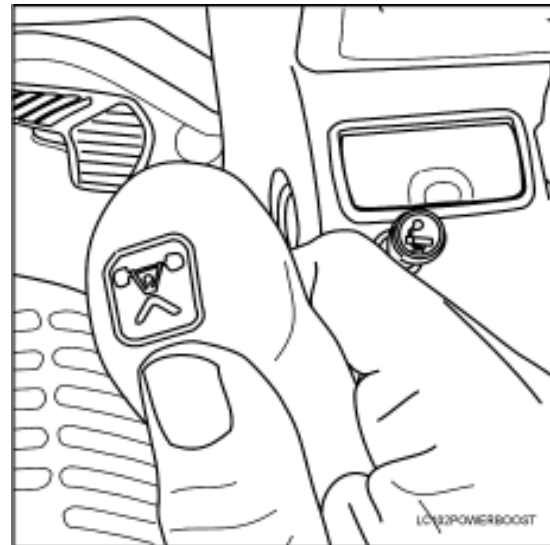


FIGURE 3.36.a

4. Fuse Box – FIGURE 3.36.b

The fuse box is located behind the operators seat. It contains all necessary fuses for the electrical circuits of the machine. Should it become necessary to inspect or change a fuse, remove the fuse box cover by gently pulling each end away from the box. Should a fuse require replacement, use a replacement fuse of the same type and amperage. Turn key switch to "OFF" and wait approximately 4 seconds for all electrical power to stop before removing or replacing a bad or blown fuse. The fuse cover incorporates a fuse puller to remove fuses.

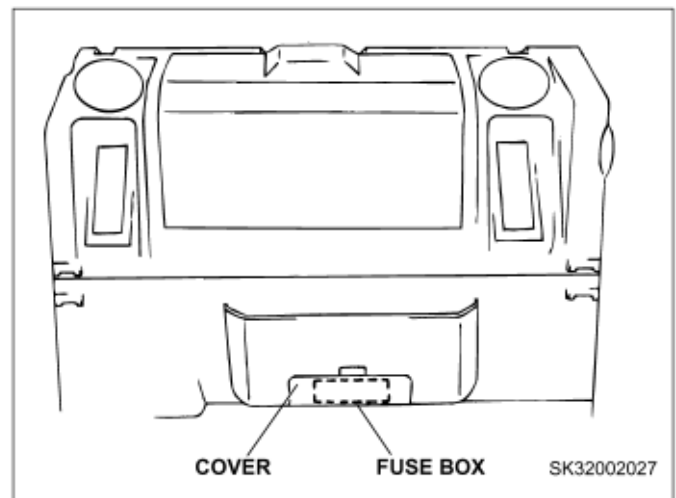
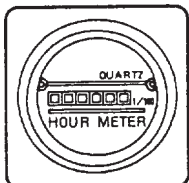


FIGURE 3.36.b

5. Hour meter



The numbers on the digital hour meter are visible even when the keyswitch is in the off position! See Figure 3.36.c The meter records the total engine operating time. If the engine is rotated the hour meter advances. The graduation runs in 1 step to 1 hour of operating time regardless of the engine speed. The indicated figures on the hour meter can be used as a guide line to understand the interval for inspection and maintenance.

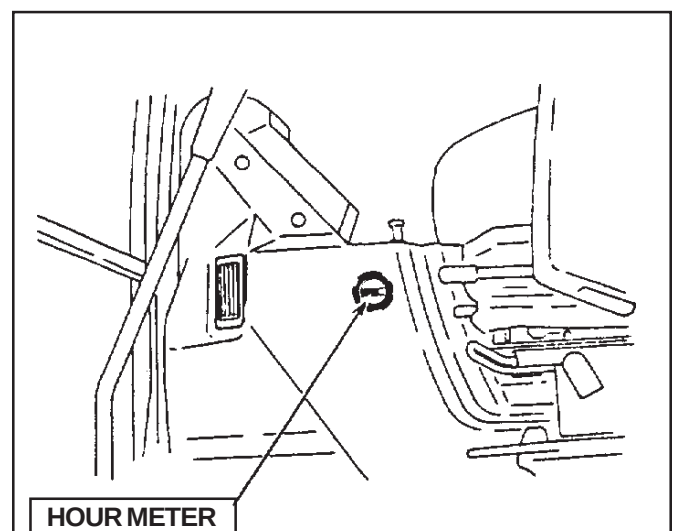


FIGURE 3.36.c

6. 12 Volt Power Supply – FIGURE 3.37.a

The 12 volt power supply is located beside the right side switch panel. For use of common auto accessories such as a fan or other accessories requiring 12 volt (DC) power, pull cover away from 12 volt power supply and insert 12 volt male socket into power supply. Replace cover after use.

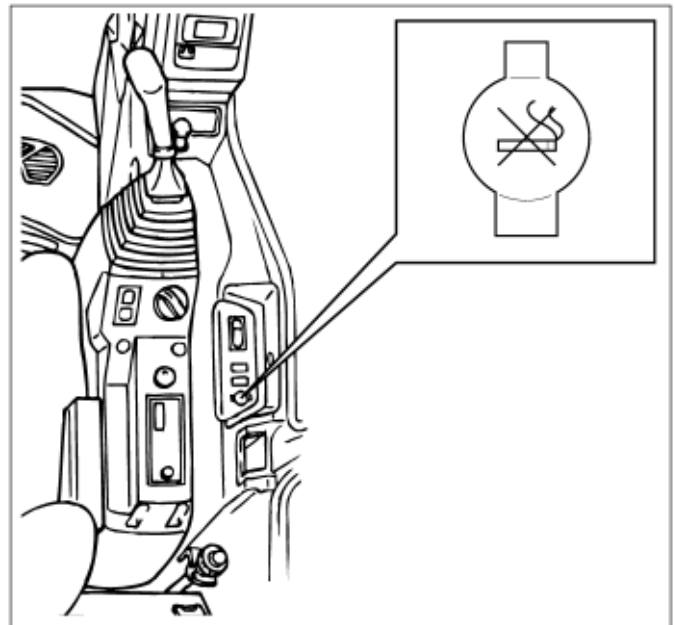


FIGURE 3.37.a

1. Engine emergency stop knob – FIGURE 3.37.b



When the engine does not stop when the keyswitch is turned to Accesory or off position, pull the emergency stop knob on the lower right hand side of the seat fully out. See Figure 3.37.c This will disrupt the fuel to the injection pump and engine stops.

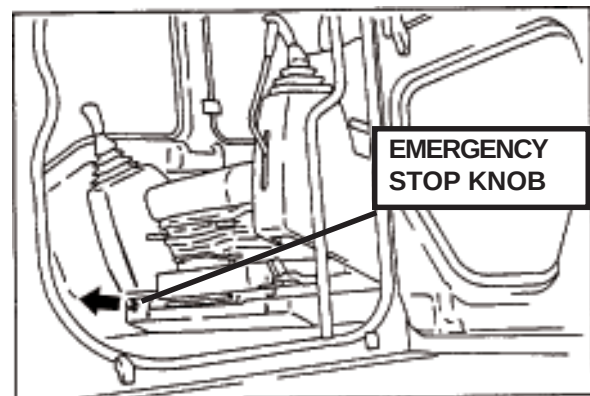


FIGURE 3.37.b

NOTE

1. Not returning the emergency knob to completely in position may make engine restarting impossible or cause poor engine performance. Be sure to return the knob completely in after usage.
2. Since the engine speed cannot be adjusted correctly during mechatronic A adjustment, if the emergency stop cable knob is not completely pushed in.



CAUTION

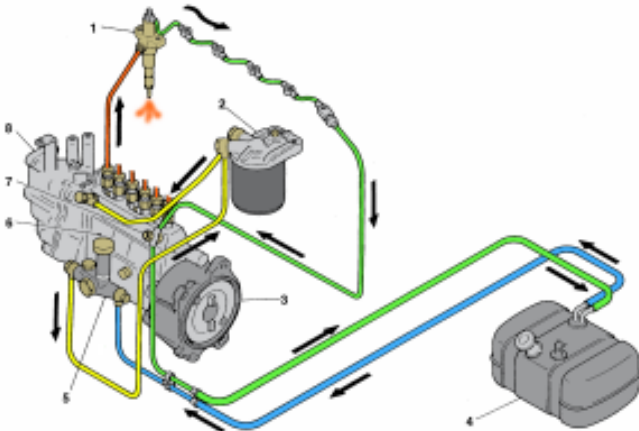
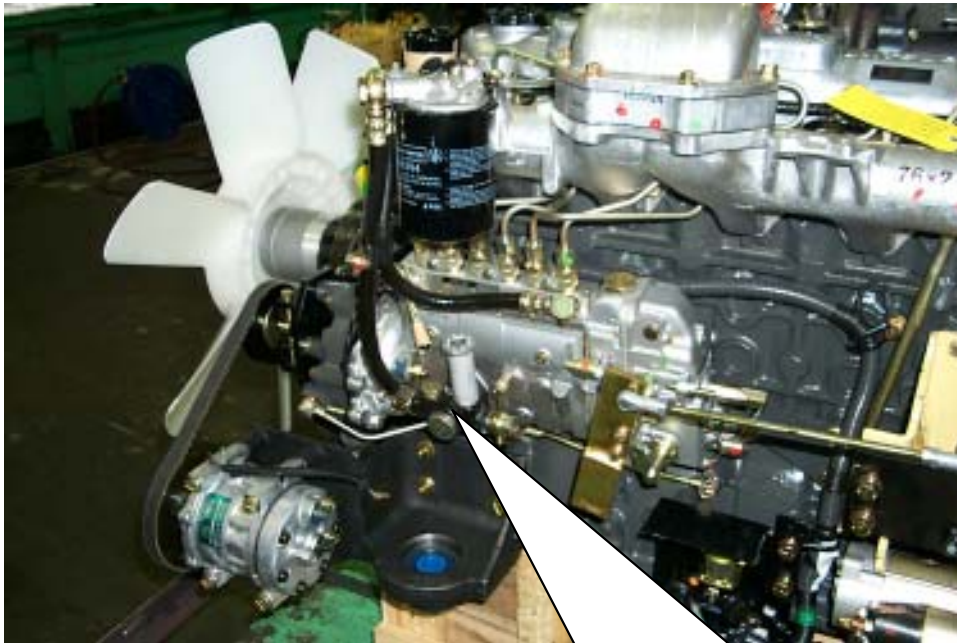


Do Not bring the engine to a sudden stop when operating at high RPM. Doing so may damage turbo or engine.



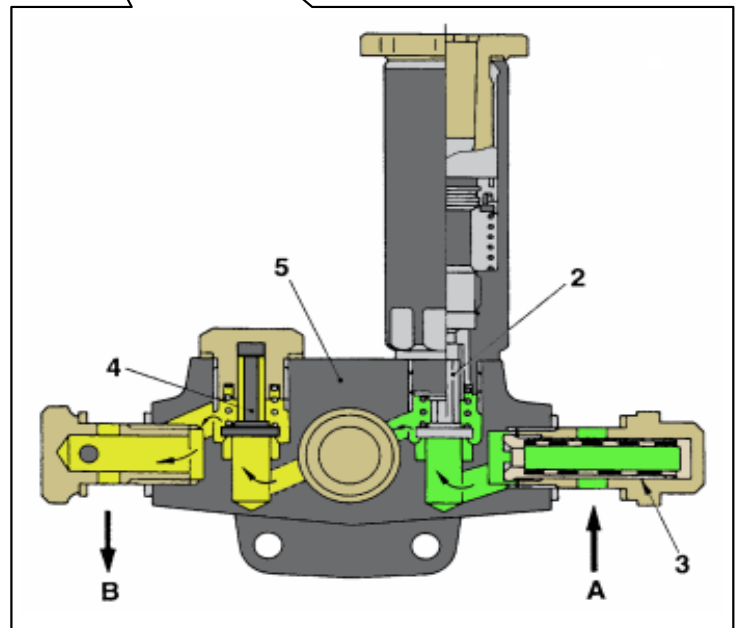
FIGURE 3.37.c

FUEL SYSTEM



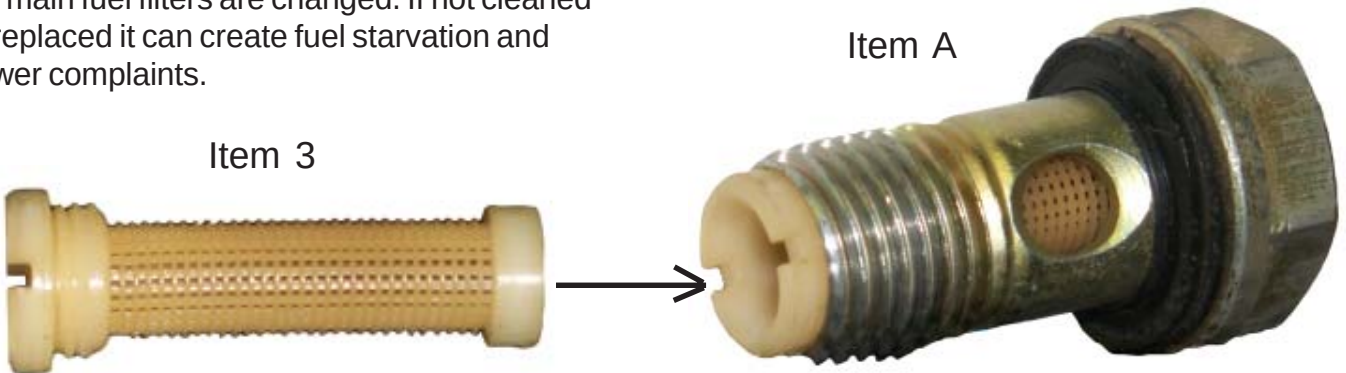
Lift Pump filter:

Lift pump inlet filter protects the lift pump from contamination and debris and should be removed and cleaned or replaced every time the main fuel filters are changed. If not cleaned or replaced it can create fuel starvation and power complaints.



Item A

Item 3



3. Safety Lock Lever – FIGURE 2.38.a

The safety lock lever is located on the front outside of the left hand operator console and is red in color. The safety lock Lever is used to lock out the hydraulic controls disallowing the use of any hydraulic function. The safety lock Lever has 2 operating positions.



“UP ”- When placed in the up position the safety lock lever stops all hydraulic controls from functioning and allows the operator to enter and exit the operator seat.



“DOWN ”- When placed in the down position, the safety lock lever allows all operating functions of the hydraulic controls to resume and also locks the left hand operating console in operating position.

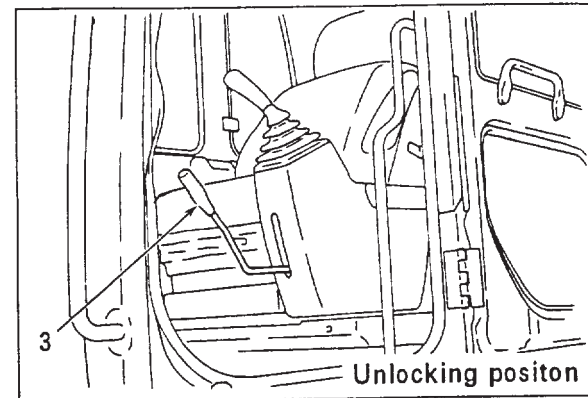
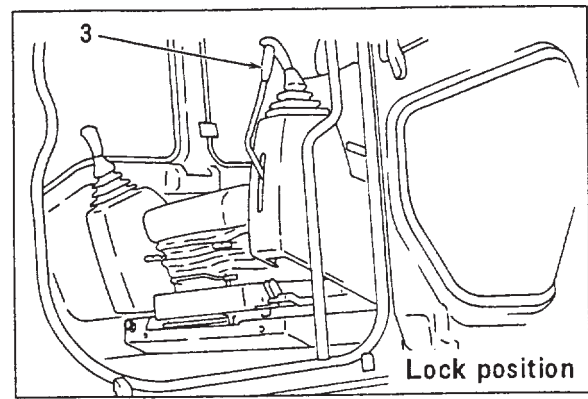


FIGURE 3.38.a

CAUTION

ALWAYS PLACE THE SAFETY LOCK LEVER IN THE LOCKED (UP) POSITION BEFORE LEAVING THE OPERATOR'S CAB.

NEVER LEAVE THE MACHINE UNATTENDED WITH ENGINE RUNNING OR LEVER IN THE DOWN POSITION.

4. Adjustment of Pilot Control Levers Height –FIGURE 2.38.b

To adjust the height of the pilot control levers, use a 17 mm wrench and remove capscrew (M10) under the operator console. The 3-stage setting hole position is as follows:

- a. From factory, the hole is set to the medium position (H1).
- b. If it is set to the medium position (H1), the valve height is raised 10mm (0.4”).
- c. When it is set to the lowest position (H2), the height is raised max.20mm (0.8 ”).

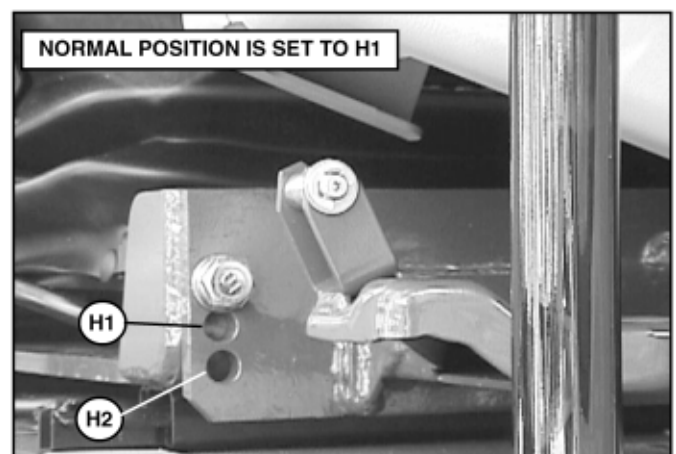


FIGURE 3.38.b



CAUTION



Hydraulic controls are designed for and set to ISO operating pattern for optimum machine performance and safety. Changing the control pattern will effect the performance of the machine.

5. Left Hand Operator Control Lever – FIGURE 2.39.a

The left hand operator control lever is located at the top front of the L.H.operator console. Its purpose is to allow the operator to control operations of the swing and arm. Operating speed of function is variable from stop to full stroke operational functions depending on how far levers operated. The left hand operator control lever has four basic operational functions.

- a. "FORWARD "– Variable speed arm out.
- b. "BACKWARD "– Variable speed arm in.
- c. "LEFT "– Variable speed left swing.
- d. "RIGHT "– Variable speed right
- e. "CENTER "– Neutral position.

6. Right Hand Operator Control Lever – FIGURE 2.39.b

The right hand operator control lever is located at the top front of the R.H. operator console. Its purpose is to allow the operator to control operations of the boom and bucket. Operating speed of function is variable from stop to full stroke depending on how far lever is operated. The right hand operator control has four basic operational functions.

- a. "FORWARD "– Variable speed boom down.
- b. "BACKWARD "– Variable speed boom up..
- c. "LEFT "– Variable speed bucket in (digging).
- d. . "RIGHT "– Variable speed bucket out (Dump).
- e. "CENTER "– Neutral position.

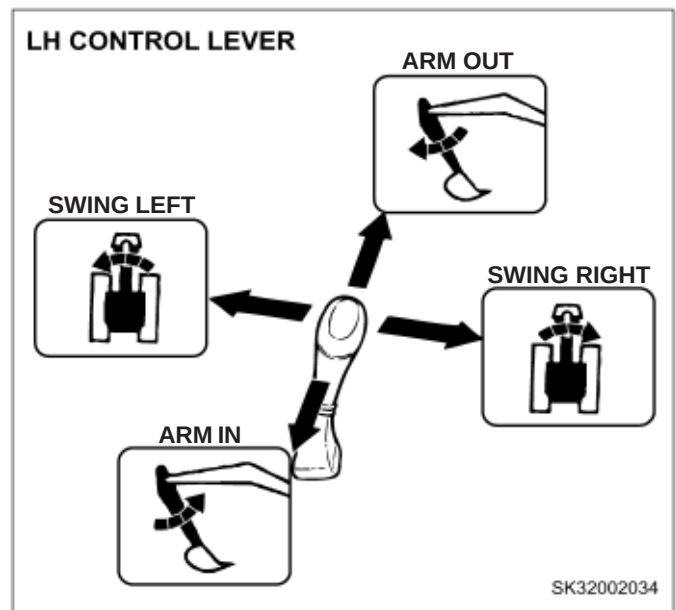
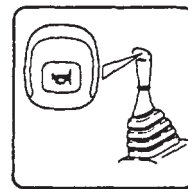


FIGURE 3.39.a

Horn Switch



Horn sounds while the switch on the grip upper section is pressed. See Figure 3.37.a

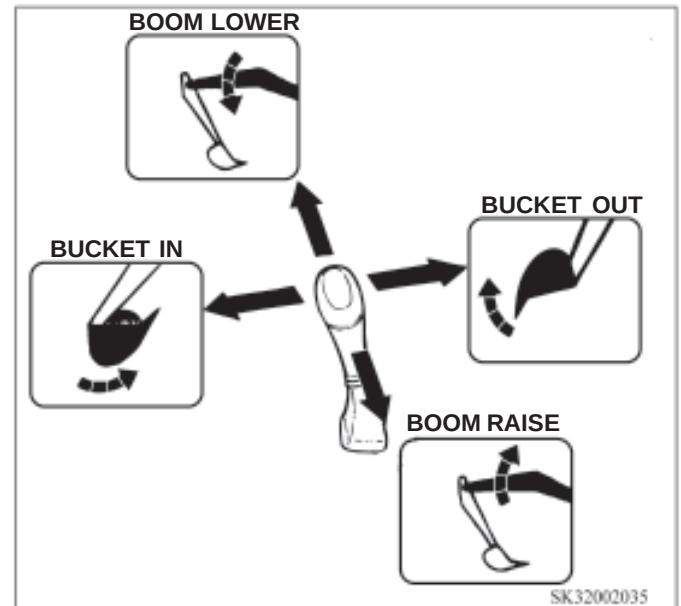
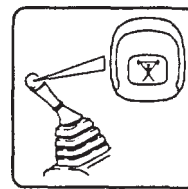


FIGURE 3.39.b

Power Boost Switch



When boost power is required for the remove an obstruction, press the switch on the grip upper section, the hydraulic system will provide a stronger digging force. See Figure 3.39.b.

THESE OPERATIONS ARE WITH TRAVEL MOTORS POSITIONED BEHIND THE OPERATOR'S CAB.

7. Left and Right Travel Levers & Pedals –FIGURE 2.40.a

The travel lever & pedal are located in front of operator seat. They are used to move the left or right track of the machine either forward or backward. These controls have 2 basic operational functions.

- a. "FORWARD"—Variable speed forward track movement.
- b. "BACKWARD"—Variable speed reverse track movement.
- c. "CENTER"—Neutral position.

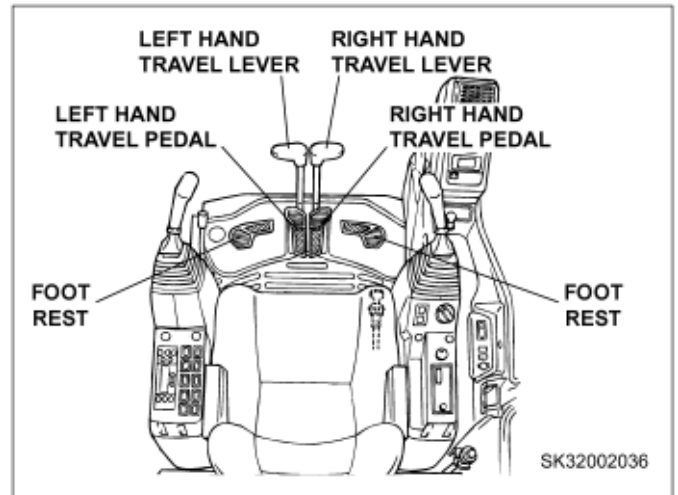


FIGURE 3.40.a

8. Removing the Travel Control Levers

- a. Use a 13 mm wrench to remove the travel control levers from the travel pedals, see Figure 2.40.b.
- b. Use a 17 mm wrench to remove the support brackets located in the air cleaner compartment, see Figure 2.40.b.
- c. Store the travel control levers properly in the air cleaner compartment and securely tighten the brackets.



FIGURE 3.40.b

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.

**KPSS WORK
MODE LAMP**

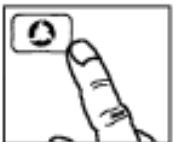
FUEL LEVEL GAUGE

**WATER TEMPERATURE
GAUGE**

L.C.D. DISPLAY

**SCREEN CHANGE
SWITCH**



START THE ENGINE	OK	
PRESS THE SCREEN CHANGE BUTTON 	2250 RPM	ENGINE RPM
PRESS THE SCREEN CHANGE BUTTON 	256 Hr ATF E/G OIL CH	ACCUMULATED HRS SINCE LAST ENGINE SERVICE
PRESS THE SCREEN CHANGE BUTTON 	OK	

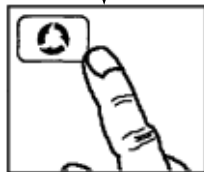
5.How to Calibrate the Engine Oil Change Interval.

TURN ON THE
IGNITION
SWITCH.



OK

PRESS THE
GAUGE CLUSTER
SCREEN CHANGE
SWITCH
ONCE.



2250 RPM

PRESS THE
GAUGE CLUSTER
SCREEN CHANGE
SWITCH AGAIN,
AND THE ACCU-
MULATED
HOURS SINCE
THE LAST ENGINE
SERVICE IS
DISPLAYED.



256 Hr ATF
E/G OIL CH

PRESS THE GAUGE CLUSTER SCREEN
CHANGE SWITCH FOR 5 TO 10 SEC. AND
RELEASE IT.



OK

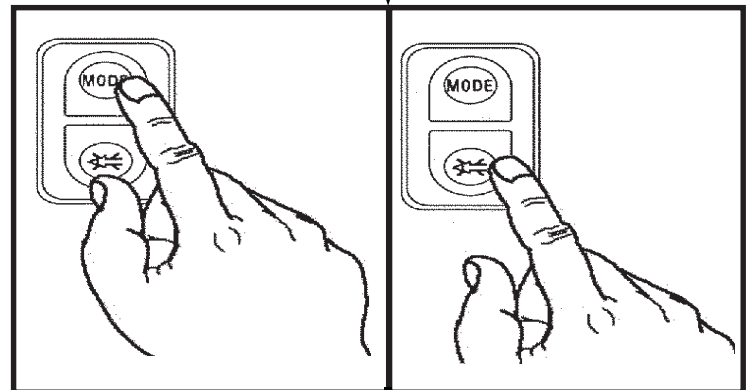
THIS SIGNAL DOES
NOT FLICKER

THIS SIGNAL AP-
PEARS ON THE
SCREEN AS LONG AS
YOU DEPRESS THE
SCREEN CHANGE
SWITCH. IT WILL
CHANGE AS SOON
AS THE SWITCH IS
RELEASED

256 Hr ATF
E/G OIL CH

PRESS THE MODE SWITCH
TO INCREASE THE HOURS

PRESS THE BUZZER SWITCH
TO DECREASE THE HOURS



NOTE: IF SWITCH
IS DEPRESSED
CONTINUOUSLY,
HOURS WILL
CHANGE RAP-
IDLY



AFTER SETTING
THE DESIRED
HOURS, PRESS
THE GAUGE
CLUSTER SCREEN
CHANGE SWITCH
TO RECORD THEM
IN THE SYSTEM

OK

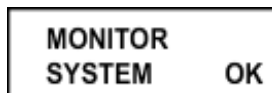
MACHINE FAMILIARIZATION PRE-M/C

L.C.D.Display

The L.C.D.Display is illustrated below and will display the Icons listed on this page. Study these icons and their definitions so that possible problems will be quickly recognized and repairs made in a timely fashion.

Normal displays

1. SYSTEM STATUS ICON



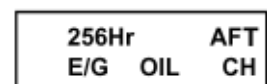
This icon will display after key switch is turned "ON" and all machine systems and components are checked by CPU and found to be in good working order.

2. ENGINE R.P.M.ICON



The engine speed (output) corresponding to the throttle potentiometer position is displayed.

3. ENGINE LUBRICATION CUMULATIVE TIME



256 hours has elapsed since the change of engine oil. This mark shows the total cumulative time on and after the time when the engine oil has been changed.

B. Warning Displays

WARNING DISPLAYS

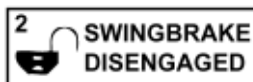
The Buzzer will sound the instant #2,#3,#5,#6,#7, #9 and #28 warning icons are displayed.

1. I.T.C.S.CONTROLLER-CPU ICON



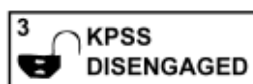
This icon will display when a problem exists in the I.T..C.S. (Intelligent Total Control System). Turn Key switch "OFF ",wait for 4 seconds until the system shuts down completely, then turn the switch back to "ON "to reset the CPU program.Should this icon remain on display, stop operation, stop engine call KOBELCO Service Technician for temporary CPU bypass procedures.

2. SWING PARKING BRAKE RELEASE ICON



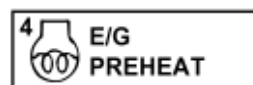
Turn the "Slewing Parking Brake Release Switch "on the rear side of operator 's seat to the "RELEASE "position,and this warning is displayed. While this warning is displayed, the swing parking brake does not actuates. This switch should be used only in the event of emergency.Call KOBELCO service.

3. KPSS RELEASE ICON



Turn the "KPSS Work Mode Release Switch "on the rear side of operator 's seat to the "RELEASE "position,and this warning is displayed.While this warning is displayed,the normal electric and hydraulic controls are impossible.This switch should be used only in the event of emergency.Call KOBELCO Service for assistance

4. ENGINE PRE-HEATING ICON



This symbol is displayed when key switch is turned to heat position and the engine preheat circuit is activated. This display goes out at completion of pre-heating,at which time FINISH PREHEAT is displayed.

5. ENGINE PRE-HEAT COMPLETE ICON

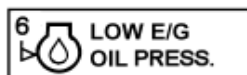


This icon is displayed when the PREHEAT is completed.If the buzzer sounds and can 't be stopped,turn key switch to the OFF position and wait for 4 sec 's until the electrical system is turned off.Then start engine.Continuous preheat after this icon is displayed could cause damage to the engine.

NOTE

Do not operate the preheat position of the key switch for more than 20 seconds at one time.

6. ENGINE OIL PRESSURE ICON



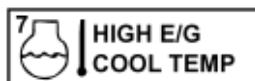
This icon will display and the Buzzer will sound should the Engine Oil Pressure drop

below a safe operating pressure. If this icon is on the display and Buzzer is sounding, stop the engine immediately and check engine oil level. Fill engine to proper level with approved motor oil.

If computer senses engine LOW OIL PRESSURE, engine speed will automatically go to "Lo idle", then immediately shut down.

This icon will Display only if alternator is charging.

7. ENGINE COOLANT TEMPERATURE ICON



This icon will display and the Buzzer will sound should the Engine Coolant Temperature

rise above safe operating temperature. Should this icon display and Buzzer sound, reduce engine RPM to idle and stop operation until engine coolant temperature reaches a safe operating temperature range

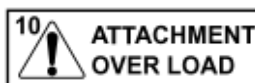
9. ENGINE AIR CLEANER ICON



This icon will display should the Engine Air Cleaner Element(s) (FILTERS)

become too dirty to allow proper air flow to the engine. Should this icon display stop engine immediately and clean or replace Engine Air Cleaner Element(s) as required. This icon will Display only if alternator is charging.

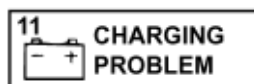
10. OVER LOAD ALARM ICON (Europe only)



This icon will display and the Buzzer will sound should the Boom Cylinder Circuit

Pressure exceed the set, specified pressure. Should this icon display and the buzzer sound, immediately stop all operation, stop engine and contact an authorized KOBELCO Service dealer for service assistance.

11. BATTERY CHARGING SYSTEM ICON



This icon will display the electrical charging system not function properly. Should

this icon display, have the electrical charging system repaired immediately. Icon displays only when engine is running with normal oil pressure and a problem occurs in the charging system.

12. FUEL LEVEL ICON

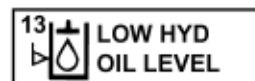


This icon will display should the Fuel Level in Fuel Tank reaches 54 liters (14 Gal.) or

less. Should this icon display refill fuel tank immediately using approved fuel oil.

(PreStart

13. HYDRAULIC OIL LEVEL ICON Icon)

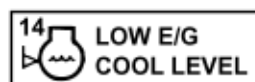


This icon will display should the Hydraulic Oil Level in hydraulic oil reservoir fall

below safe operating level. Should this icon display before starting engine, position machine in Hydraulic Oil Check position and check sight gauge for oil level. Fill hydraulic reservoir to proper level using approved hydraulic oil. This icon will not display with engine running and a loss of hydraulic oil is experienced.

(PreStart

14. ENGINE COOLANT LEVEL ICON Icon)

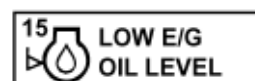


This icon will display should the Engine Coolant Level fall below safe operating

level. Should this icon display before starting the engine, check and fill coolant level in the radiator and coolant reservoir. Icon will not display if alternator is charging and a sudden loss of coolant is experienced.

(PreStart

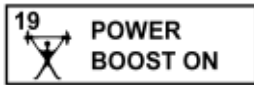
15. ENGINE OIL LEVEL ICON Icon)



This icon is displayed when the engine oil level of the engine oil pan is low. Check

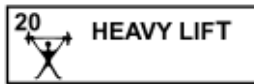
the engine oil level immediately and make up the shortage of the engine oil.

19. ATTACHMENT BOOST PRESSURE ICON



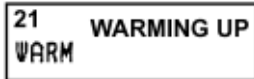
This icon will display when the Power Boost Switch is depressed. This icon is displayed only when this system is activated during operation.

20. HEAVY LIFT PRESSURE ICON



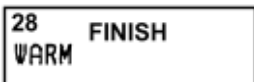
This icon will display when the Heavy Lift Switch is in the "ON" position. This icon is displayed only when this system is activated during operation.

21. AUTO WARMING UP ICON



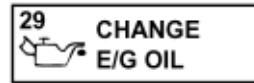
This icon is displayed to indicate the warming up operation of the engine and hydraulic oil when the engine runs in decel condition after the key switch is turned on and the auto warm up selector switch on the left console is set to "ON" position. Turn off the auto warm up select switch, and the key switch OFF, to forcibly stop the auto warm up system and the display disappears.

28. AUTO WARMING UP FINISH ICON



This icon is displayed when the warming up of the engine or hydraulic oil is finished or the warming up is stopped forcibly by operating the lever or turning the auto warm-up switch OFF forcibly, and concurrently the buzzer sounds continuously for about 5 seconds.

29. REPLACE ENGINE OIL ICON



This icon will display at every 500 hours of machine operation to remind operator of scheduled engine oil change. The recommended oil change interval for MITSUBISHI engines is every 500 hours of operation.

When this icon is displayed and the buzzer sounds, press the buzzer stop switch once to stop the buzzer sound, and a second time to reset the oil change interval to Zero. Make sure to recalibrate the engine oil change intervals.

MACHINE FAMILIARIZATION PRE-M/C

The following chart is aimed at familiarizing personnel with the priority of the Gauge Cluster Display Icons. Pay close attention to these icons as they can aid in avoiding unnecessary repairs and expense.

The icons in the chart below are listed in priority from the most serious to least serious. EXAMPLE: If the engine oil pressure is abnormal and Fuel level is low, the engine oil pressure Icon will display and buzzer will sound. After the oil pressure is back to safe operating pressure, the low fuel Icon will display.

LCD display	SERVICE FUNCTION ICON SEQUENCE	BUZZER SOUNDING
NORMAL DISPLAY		No sounding
Note: Assist mode not available on SK480 ASSIST MODE DISPLAY	Supplementary Explanation : The screen can be switched into three images by pressing the screen change switch.	No sounding •For the description of display of the assist mode. •Each display flickers during operation.
WARNING	1 CPU MECHATRO CONT. FAIL 2 SWINGBRAKE DISENGAGED 3 KPSS DISENGAGED 4 E/G PREHEAT 5 FINISH PREHEAT 6 LOW E/G OIL PRESS. 7 HIGH E/G COOL TEMP 9 REST'D AIR CLEANER 10 ATTACHMENT OVER LOAD 11 CHARGING PROBLEM 12 LOW FUEL LEVEL 13 LOW HYD OIL LEVEL 14 LOW E/G COOL LEVEL 15 LOW E/G OIL LEVEL 19 POWER BOOST ON 20 HEAVY LIFT 21 WARMING UP WARM 28 FINISH WARM 29 CHANGE E/G OIL	•#2,#3,#5,#6, #7,#10,#28 Buzzer sounds. Supplementary Explanation : Icons #5 and #6 are displayed and buzzers do not stop sounding even if the buzzer stop switch is pressed. When icon 6 is displayed, the engine RPM will idle immediately and the engine will shut down after 15 seconds. Icon #7 is displayed and buzzer stops sounding when the buzzer stop switch is pressed. Icons #2,#3,#10 and #28 are displayed and buzzers sound intermittently and stop sounding after 5 seconds.



DANGER

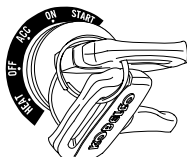
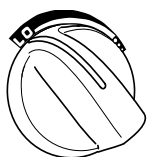


DO NOT OPERATE MACHINE UNLESS YOU HAVE READ AND UNDERSTOOD THE INSTRUCTIONS IN THE OPERATOR'S MANUAL. IMPROPER MACHINE OPERATION IS DANGEROUS AND COULD RESULT IN INJURY OR DEATH.

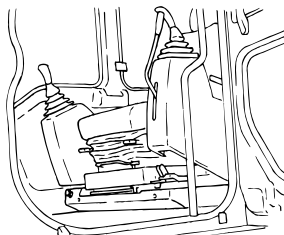
PATTERN CONTROL CHANGE

A. To change the machine's control pattern from SAE to Back Hoe Loader pattern, proceed as follows:

1. Place the attachment on the ground, throttle control in low idle, and turn the ignition key off.

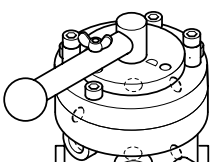


2. Place the safety lever in the lock and up position before leaving the cab.

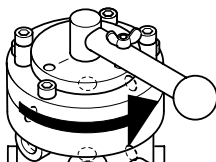


3. Open the air cleaner compartment door, locate the pattern changer valve and change valve's handle position from "I" (SAE) to "D" (Back Hoe Loader).

SAE PATTERN



BHL PATTERN



WARNING



CHECK MACHINE'S CONTROL PATTERN FOR CONFORMANCE TO PATTERN ON DECAL-CARD IN CAB. IF PATTERN DOES NOT MATCH DECAL-CARD ON CAB DOOR HOLDER, FLIP DECAL-CARD ON HOLDER TO MATCH THE MACHINE'S CONTROL PATTERN BEFORE OPERATING MACHINE. FAILURE TO DO SO COULD RESULT IN INJURY.



WARNING



SHOULD THE CONTROL PATTERN DECAL-CARD IS LOST, ORDER P/N: YN20T01476P1.

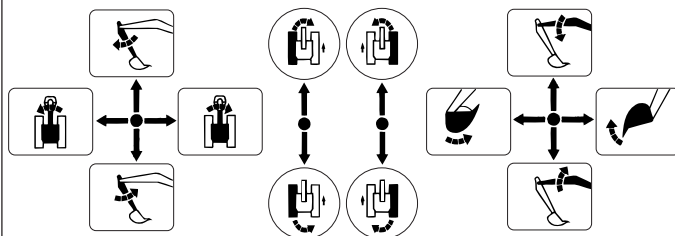


WARNING



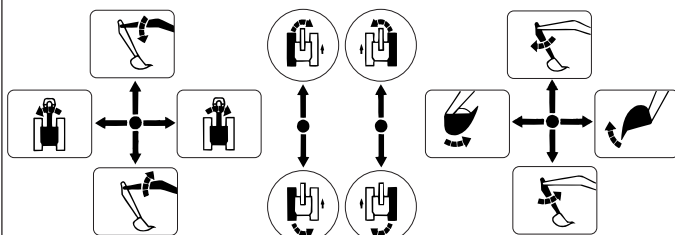
WHENEVER A CHANGE IS MADE TO THE MACHINE'S CONTROL PATTERN, ALSO EXCHANGE THE PATTERN DECAL IN THE CAB TO MATCH THE NEW PATTERN.

SAE PATTERN



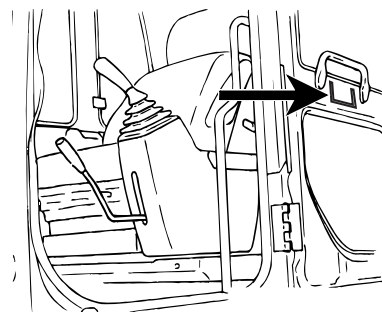
YN20T01476P1

BHL PATTERN

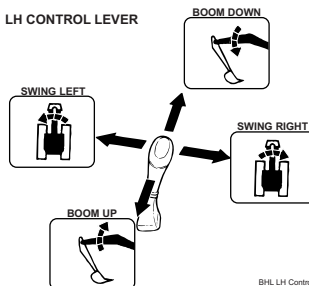


YN20T01476P1

- B.** Make sure to place the BHL pattern plate in its respective holder, located below the cab door handle. Make sure BHL pattern is showing.



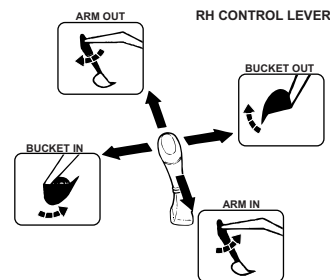
LH CONTROL LEVER



BHL LH Control

- C.** Slowly operate Left Hand control to make sure it matches BHL pattern and to familiarize yourself with the new control pattern.

- D.** Slowly operate Right Hand control to make sure it matches BHL pattern and to familiarize yourself with the new control pattern.



BHL RH Control

The logo for Dynamic Acera is displayed in a light gray, semi-transparent style. It features the word "Dynamic" in a bold, italicized, sans-serif font, with the "D" being significantly larger and more stylized. Below "Dynamic" is the word "Acera" in a similar bold, italicized, sans-serif font. The entire logo is centered horizontally within the page.

Table of contents

	Page
3.1 FAMILIARIZATION	3-59
3.2 GENERAL MACHINE NOMENCLATURE	3-60
3.3 OPERATOR CAB NOMENCLATURE	3-60
2.4 COMPONENT & CONTROLS NOMENCLATURE	3-61
A. RIGHT HAND OPERATOR CONSOLE AND MONITOR	3-61
A1. Key Switch– FIGURE 2.4A	3-51
A2. Throttle Potentiometer– FIGURE 2.4B	3-61
A3. Monitor – FIGURE 2.5A	3-62
1. KPSS Mode Switch– FIGURE 2.5B	3-62
2. Buzzer Stop Switch – FIGURE 2.5C	3-63
3. Screen Change Switch – FIGURE 2.7A	3-64
4. Wiper & Washer Switch– FIGURE 2.7B	3-64
5. Auto Accel Switch– FIGURE 2.7D	3-64
6. Working Light Selector Switch — FIGURE 2.8A	3-65
7. Travel speed select switch – FIGURE 2.8B	3-65
8. L.C.D. Display– FIGURE 2.29	3-66
9. Preventive Maintenance Program – FIGURE 2.12A	3-66
10. Monitor Time Adjustment – FIGURE 2.13A	3-67
11. LCD Contrast Adjustment – FIGURE 2.13B	3-68
12. Changing Warning Display Language – FIGURE 2.13C	3-68
13. Operability fine adjustment function for Dynamic Acera minor change (SK160LC~SK330LC-6E)	3-69
14. Draining Hydraulic System Pressure – FIGURE 2.15A	3-73
A4. Power Boost Switch – FIGURE 2.15D	3-73
A5. 24 Volt Cigarette Lighter – FIGURE 2.16A	3-74
A6. Location for Optional Switches – FIGURE 3-16B	3-74
A7. Cup Holder and Ashtray – FIGURE 2.16C	3-74
A8. Radio – FIGURE 2.17A	3-75
B. LEFT HAND OPERATOR CONSOLE	3-76
B1. Climate Control Air Conditioner – FIGURE 2.18A and 2.18B	3-76
I. Control Panel Description	3-76
II. Fundamental Use – FIGURE 2.18B	3-76
III. Control Panel Functions	3-76
B2. Auto Warm Up Selector Switch – FIGURE 2.22A	3-77
B3. Independent Travel Select Switch – FIGURE 2.23A	3-78
B4. Heavy Lift Switch – FIGURE 2.23B	3-78
B5. Swing Flasher Switch – FIGURE 2.23C	3-78
B6. Double Pump Flow Selector Switch– FIGURE 2.23D (Optional for SK290LC/SK330LC-6E)	3-78
C. REAR PANEL AND OTHERS	3-79
C1. Swing Parking Brake Release Switch and Hydraulic Back Up System	3-79
C2. 12 Volt Power Supply – FIGURE 2.25A	3-79

2.1 FAMILIARIZATION

All operators, service mechanics and personnel responsible for operation, inspection and maintenance of the machine should become thoroughly familiar with the controls and components and their functions before working with or on this equipment.

Study the information in this section to become familiar with the controls and components of this machine.

2.2 GENERAL MACHINE NOMENCLATURE

The Nomenclature drawing below (FIGURE 2.2), points out locations of major components of the KOBELCO Dynamic Acera Hydraulic Excavators.

Study these areas and locate these components on the machine. Specific information regarding these components are explained on the following pages of this section.

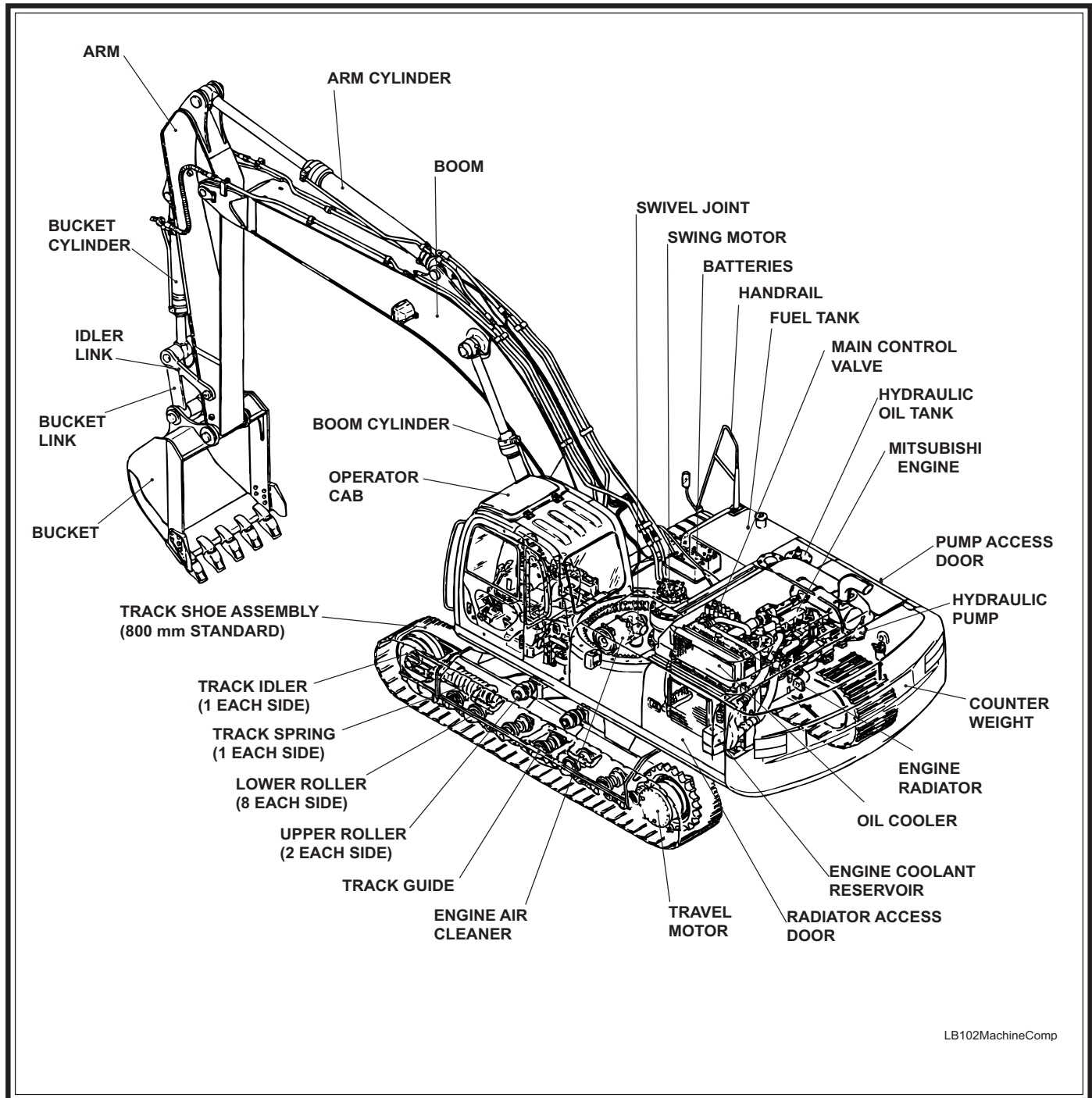


FIGURE 2.2

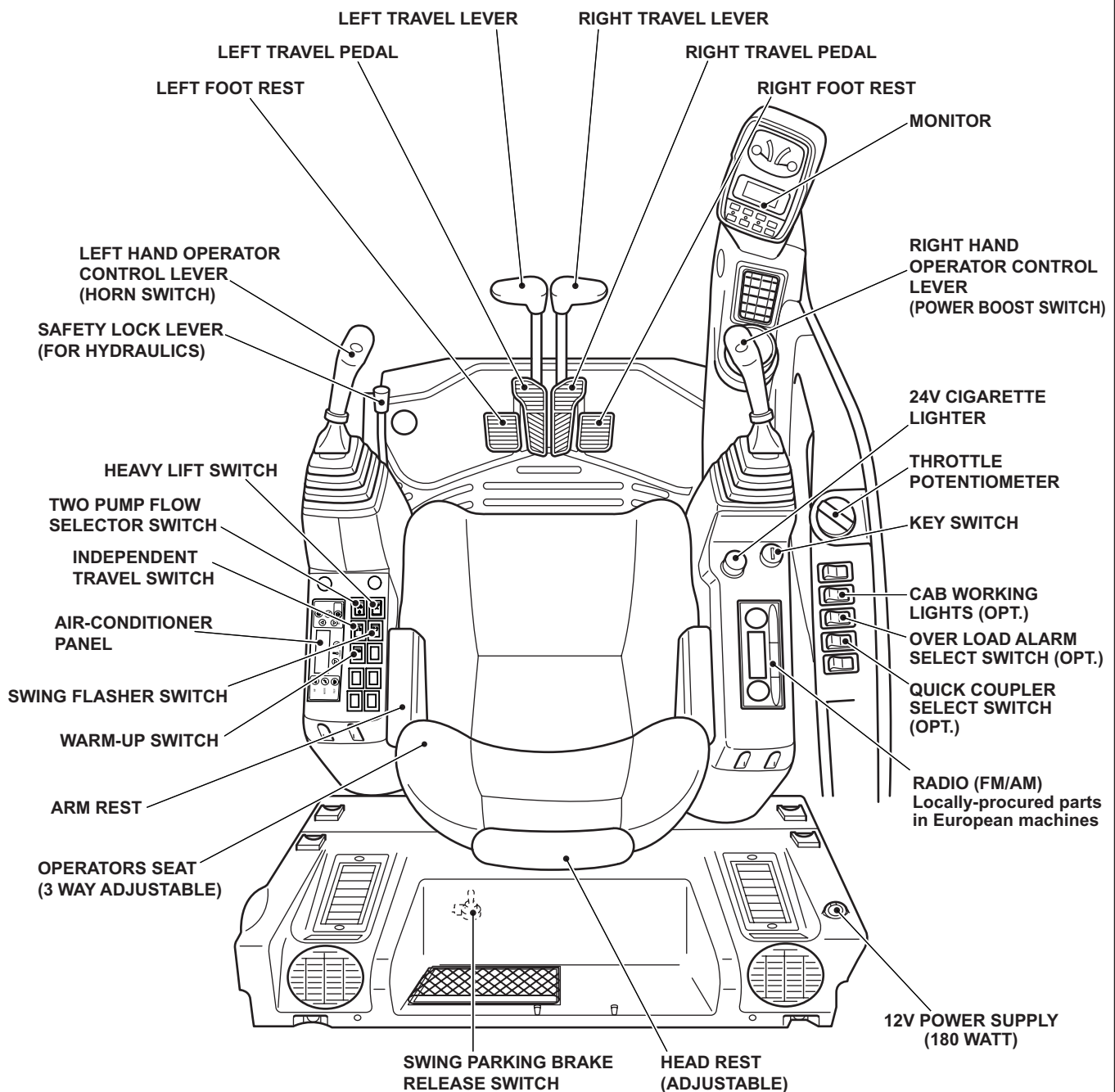
LB102MachineComp

MINOR CHANGE MACHINE FAMILIARIZATION

2.3 OPERATOR CAB NOMENCLATURE

The operator cab nomenclature (FIGURE 2.3), points out locations of operator controls of the
KOBELCO DYNAMIC ACERA Minor Change

hydraulic excavators operator cab. Study these areas and locate these components on the machine. Specific information regarding these components are explained on the following pages of this section.



YQ102CabComm

FIGURE 2.3

2.4 COMPONENT & CONTROLS NOMENCLATURE

The following information provides a brief description and function of the components and controls of the KOBELCO Dynamic Acera Hydraulic Excavators.

All personnel associated with this machine should read and understand this information BEFORE beginning any work with or on this equipment.

A. RIGHT HAND OPERATOR CONSOLE AND MONITOR

A1. Key Switch- FIGURE 2.4A

The Key Switch is located on the right hand operator console and has 5 operating functions.

- a. "HEAT"- This position is used for starting the engine in cold climates. See Section III.
- "OFF"- When Key is turned to this position, the engine stops and electrical power to the machine's electrical systems is stopped after approximately 4 seconds.
- "ACC"- With key in the "ACC" position only the cigarette lighter, tuner and horn will have power.
- "ON"- When Key is in the ON position, electrical power is supplied to all the machine's electrical systems.
- "START"- When key is turned to this position electrical power is supplied to the starter solenoid causing the starter to start the engine. After engine starts key should be released to go back to the "ON" position.

A2. Throttle Potentiometer- FIGURE 2.4B

The throttle potentiometer is located on the right hand operator console and controls engine RPM. When the throttle potentiometer is rotated to any position it increases or decreases engine rpm and maintains engine at the programed RPM for that particular position on the dial.

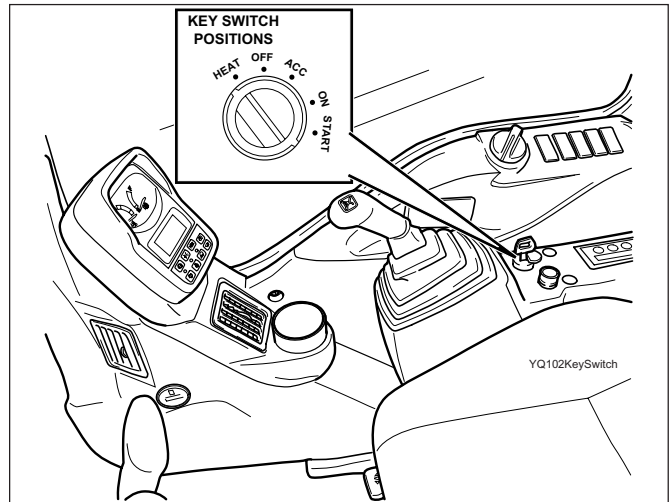


FIGURE 2.4A

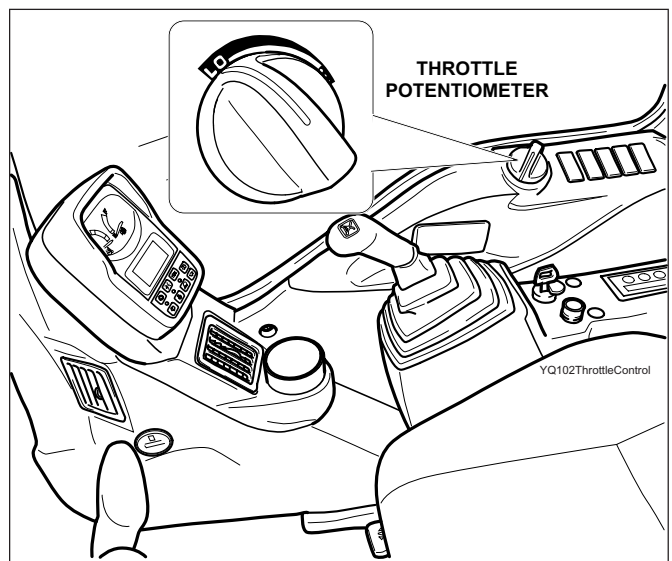


FIGURE 2.4B

NOTE

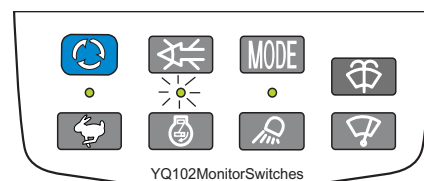
1. In operation, when the pilot pressure from the hand and pedal control levers are not used for 1 sec, if the position of the throttle potentiometer is higher than 1050 rpm, the auto accel actuates automatically and the engine speed returns to 1050 rpm.
2. When the throttle potentiometer is positioned lower than the auto accel speed, the engine speed is maintained to the throttle potentiometer position.

Proportional auto acceleration function:

With the attachment, swing, travel control lever or control pedal operation, the engine speed returns to the accel dial set position gradually according to the respective operating pilot valve movement.

NOTE

The proportional auto acceleration function can be activated by pressing the auto accel switch () located on the monitor panel. When the proportional auto acceleration function is active, the red light indicator above this switch is ON.



Press the auto accel switch to cancel the proportional auto acceleration function and the light indicator will turn OFF.

MINOR CHANGE MACHINE FAMILIARIZATION

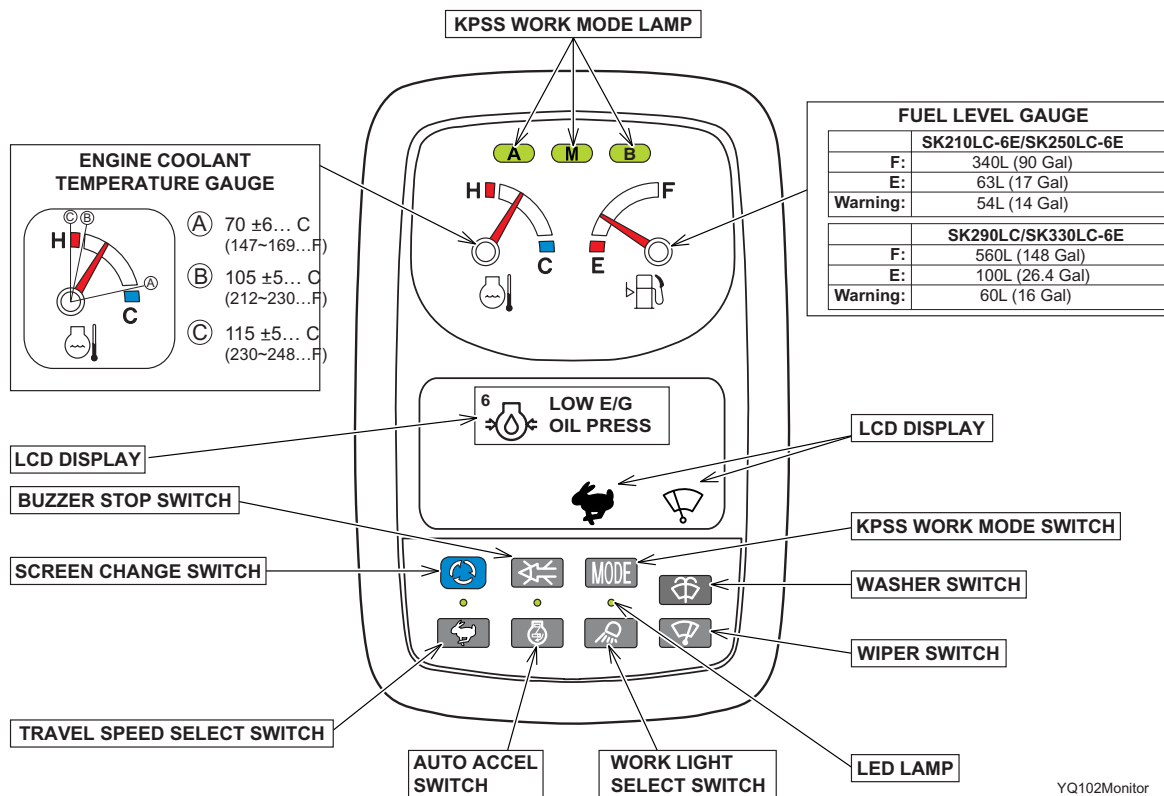


FIGURE 2.5A

A3. Monitor – FIGURE 2.5A

1. KPSS Mode Switch– FIGURE 2.5B

MODE

The KPSS Mode Switch is located on the lower side of the monitor and has 3 operating functions.

After starting the engine, the mode switch defaults to the **M** mode.

Select an effective work mode complying with the working condition and working target from 3 modes.

Each time the work mode switch is pressed, the work mode indicator lamp is switched to **M**, **A** and **B** in order.

a. A (assist) mode

The controller analyzes the operator's control pattern of joystick lever movement, and uses "fuzzy logic" to set the machine operating mode: digging, leveling, spreading, slope finishing, tamping etc. automatically, and displays the results on the multi display, see Fig. 2.5C. The necessary power and engine speed is automatically set to match the work load. This mode utilizes 90% of the machine's available power to allow the operator to be more efficient in standard repetitive applications, and obtain better fuel economy.

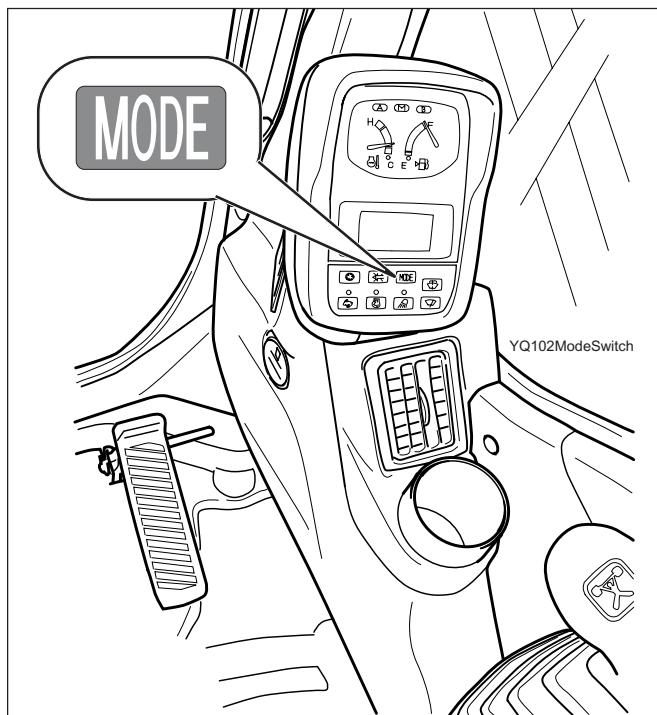
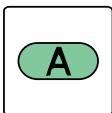


FIGURE 2.5B

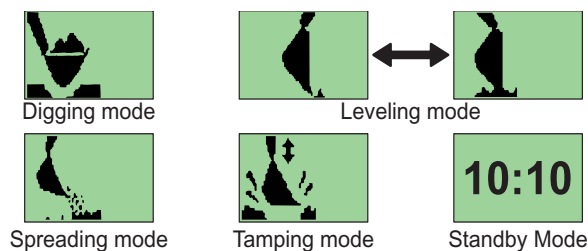


FIGURE 2.5C

NOTE

By default, all Dynamic Acera minor change standard excavators, manufactured by KCMA LLC, start in "M" Mode; and by default, all Dynamic Acera excavators equipped with long reach attachment start in "A" mode.

M

b. M (manual) mode

This mode senses the movement of control lever and is suitable for the heavy load digging work giving priority to the work load at high speed. It is selected upon startup by default. While it does engage computer control to obtain maximum pump efficiency, it does not utilize “fuzzy logic” software to switch between working modes. It provide the greatest power and speed that the excavator has to offer.

B

c. B (breaker) mode

This mode allows the operator to control the maximum flow rate for the auxiliary attachment (Breaker) only. The arm, boom, swing, etc, get 100% flow regardless of this setting.

c1. Adjustment of max. flow rate

- Turn ignition key on, **do not start engine**.
- Select the B (Breaker) Mode.
- Press the Screen Change switch () for 3 ~ 10 sec and release it.

The LCD screen displays the flow rate settings.

c2. Flow rate display

The last flow rate stored is displayed. Maximum flow rate is displayed as standard value.

- Press the mode switch, see Figure 2.5B, to increase the flow rate setting or press the buzzer stop switch to decrease the flow rate setting.

Note: If the switches are depressed for more than 2 sec., the flow rate increases or decreases by 10 Lit/min.

The flow rate can be adjusted from the Maximum up to Minimum range.

Press the switch for screen change again () to store the desired flow rate value, and the adjust mode is canceled.



Buzzer Stop Switch – FIGURE 2.5C

When the engine coolant temperature is too high, or various sensors of mechatro controller (self-diagnosis) fail, the alarm sounds intermittently. To stop the sound, press the buzzer stop button.

NOTE

- Buzzer sounding due to engine overheating can not be stopped.
- The buzzer sounding, because the preheat complete and E/G oil pressure are displayed, stops by turning the key switch OFF.

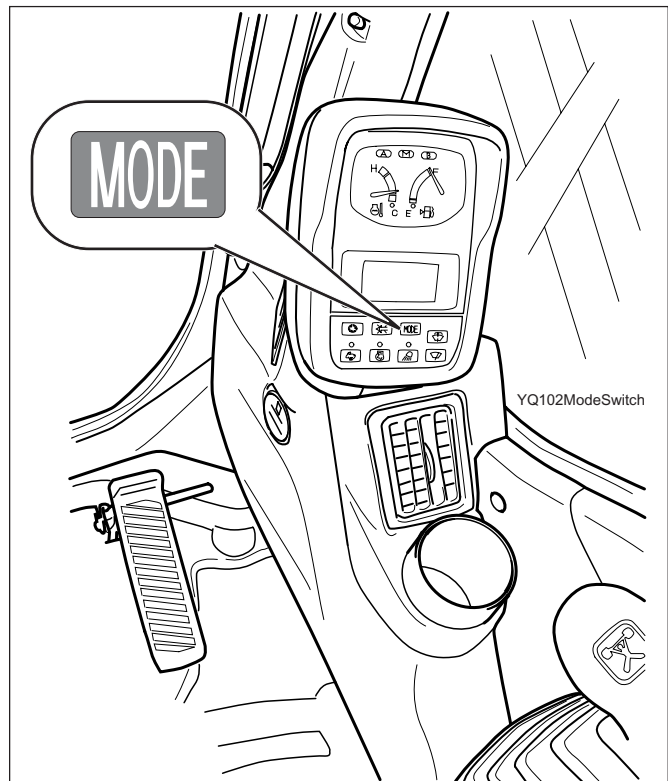


FIGURE 2.5A



FIGURE 2.5B

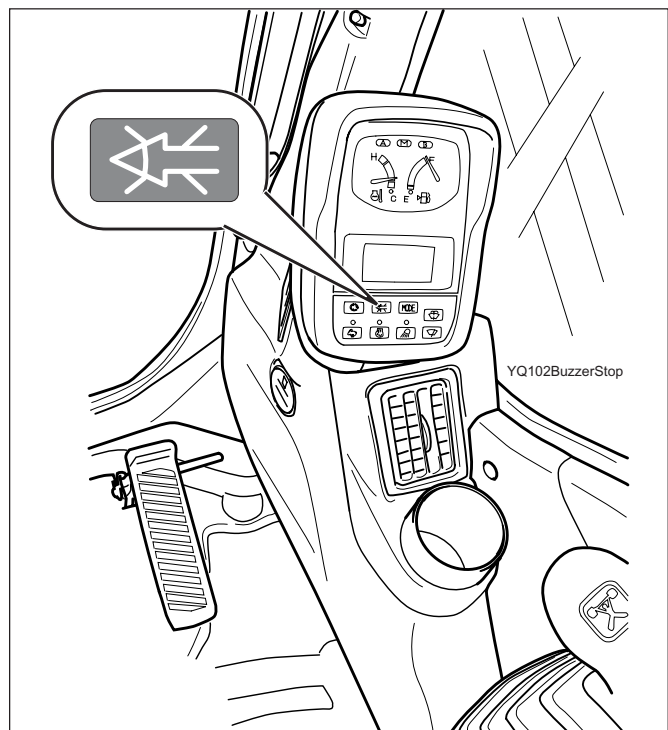


FIGURE 2.5C

3. Screen Change Switch – FIGURE 2.7A

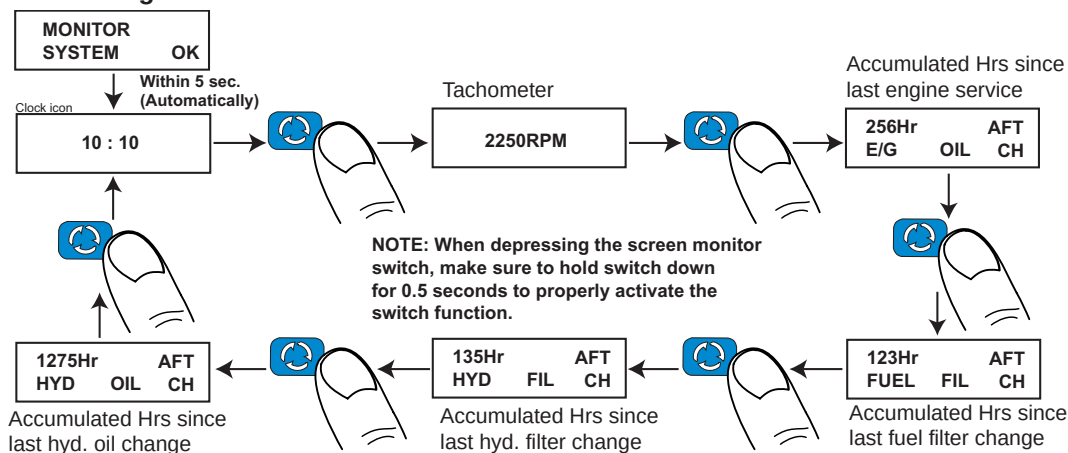


FIGURE 2.7A

4. Wiper & Washer Switch– FIGURE 2.7B



- Press it once : Wiper moves intermittently
- Press it again : Wiper moves continuously
- Press it once more : Wiper stops moving



- Press this switch, and washer fluid is sprayed while it is depressed. The washer fluid reservoir is located behind the cab, in the air cleaner compartment. See Figure 2.7C.

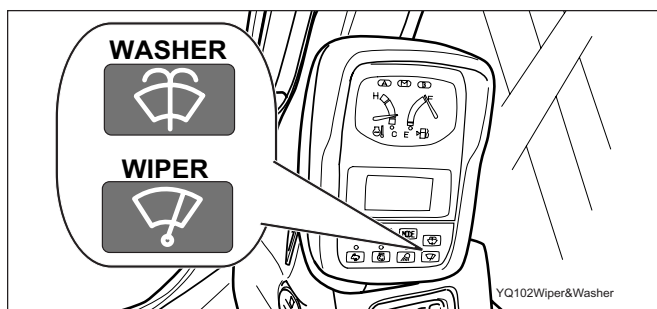


FIGURE 2.7B

CAUTION

Make certain the Washer reservoir has washer fluid before operating washer.

5. Auto Accel Switch– FIGURE 2.7D

This switch is used to activate and cancel the auto accel function.

- Press it once : With auto accel functional deactivates auto accel and the light indicator above the switch is turned OFF.
- Press it again : The auto accel function is reactivated and the light indicator is turned ON.

NOTICE

When auto accel is deactivated the rpm will not increase when the button is first pressed for safety, pilot joystick lever movement to full stroke must be carried out one time to deactivate the auto accel function. After this action throttle response will be controlled thru the throttle potentiometer.

NOTE

All Dynamic Acera minor change excavators will default to the proportional auto acceleration function when the ignition key is turned to the OFF position.

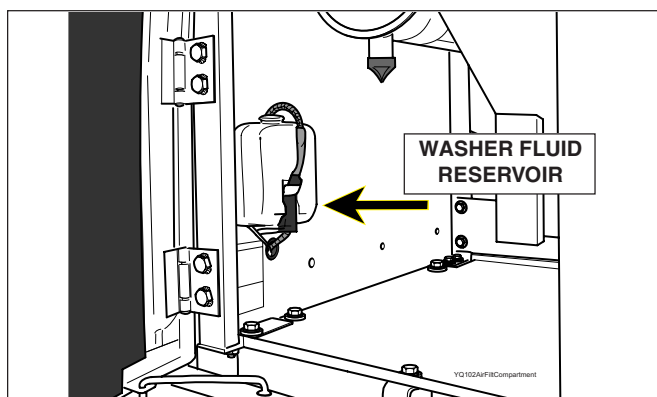


FIGURE 2.7C

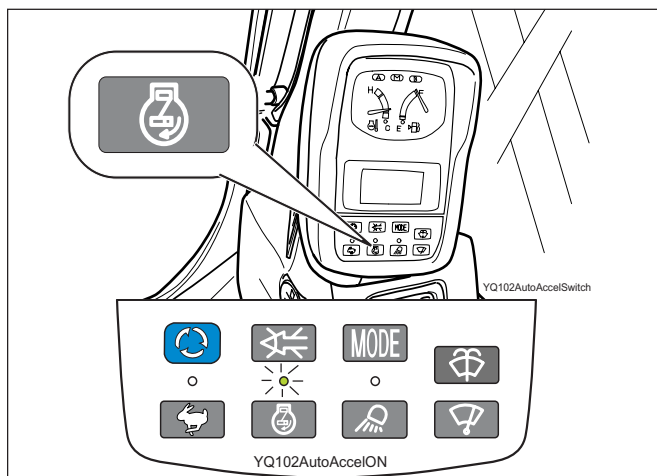


FIGURE 2.7D

6. Working Light Selector Switch — FIGURE 2.8A

This light selector switch is located on the lower side of the monitor as shown in Fig. 2-8A.

1. Press the switch once: The frame and boom working lights come on and the symbol "F" displays on the lower side of the LCD screen and the light indicator above the switch is turned ON..
2. Press the switch a second time: The rear working lights come on and the symbol "R" displays on the lower side of the LCD screen.
3. Press the switch a third time: the frame, boom, the rear working lights, and the light indicator on the monitor panel will turn OFF.

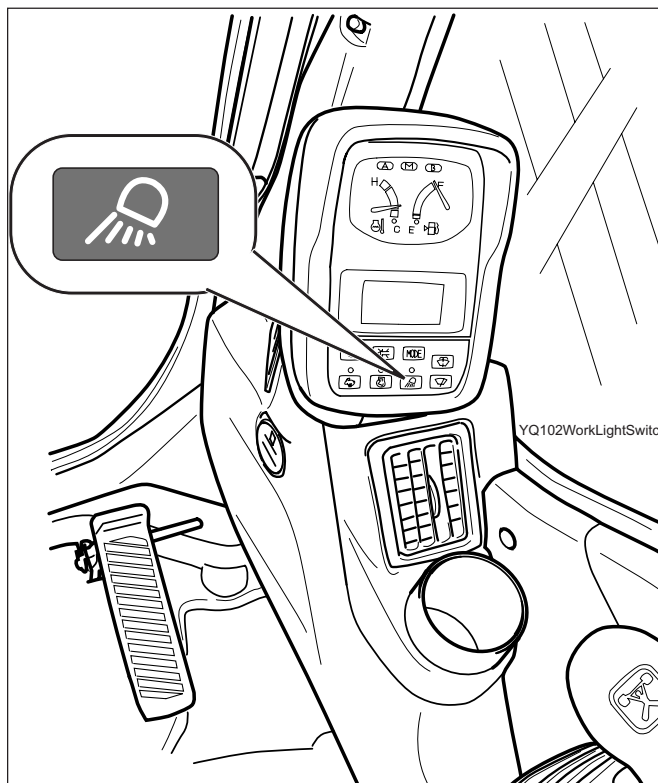


FIGURE 2.8A

7. Travel speed select switch – FIGURE 2.8B

The travel speed select switch is located on the gauge cluster switch panel. Each time engine is started, travel speed is automatically set to LOW 1st (🐢) speed. Press the travel speed (🐇) switch on the gauge cluster, the speed is changed to the HIGH 2nd, the fast travel speed icon (🐇) is indicated on the multidisplay, and the light indicator above the switch is turned ON.

🐢 Set to LOW when moving the machine on a rough or soft road, slope, or in a narrow place, or when powerful tractive force is required.

🐇 Set to HIGH when moving the machine on flat, hard ground.

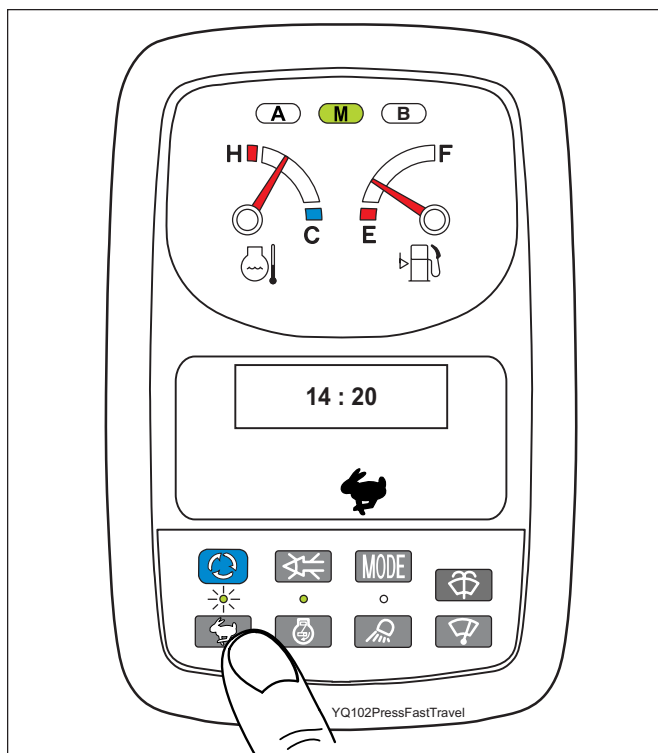


FIGURE 2.8B

DANGER

DO NOT USE HIGH (🐇) SPEED WHEN PERFORMING DELICATE OPERATIONS SUCH AS PIPE LAYING, FINE GRADING OR LOADING MACHINE ONTO A TRAILER.

DO NOT CHANGE TRAVEL SPEED WHILE LOADING, MACHINE COULD BECOME UNSTABLE AND CAUSE SERIOUS INJURY, EQUIPMENT DAMAGE AND/OR DEATH.

8. L.C.D. Display- FIGURE 2.29

The L.C.D. Display is illustrated below and will display the Icons listed in this section. Study these icons and their definitions so that possible problems will be quickly recognized and repairs made in a timely fashion.

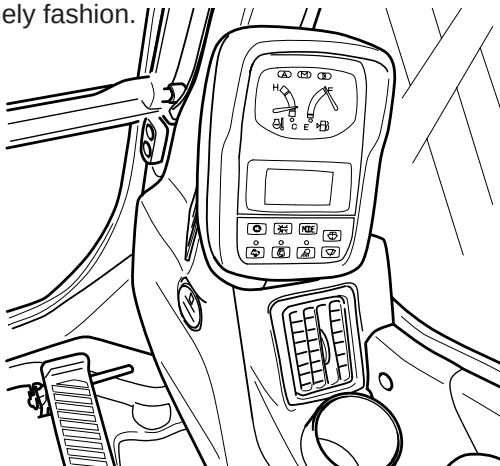


FIGURE 2.29

a. Normal displays

a1. SYSTEM STATUS DISPLAY

**MONITOR
SYSTEM** **OK**

This icon will display after key switch is turned "ON" and all machine systems and components are checked by CPU and found to be in good working order.

a2. DAY TIME DISPLAY

10 : 10

Five seconds after the system status is shown on the LCD, the time will be displayed on the monitor. See "Monitor Time Adjustment" in this section for details on how to set this feature.

a3. ENGINE R.P.M. DISPLAY

2250RPM

Actual engine speed. When auto-accel. is deactivated, RPM shown corresponds to the throttle potentiometer position.

a4. ENGINE LUBRICATION CUMULATIVE TIME

256Hr **AFT**
E/G **OIL** **CH**

256 hours have elapsed since the change of engine oil.

This icon shows the total cumulative time since the last time the engine oil was changed.

a5. FUEL FILTER CUMULATIVE TIME

256Hr **AFT**
FUEL **FIL** **CH**

256 hours have elapsed since the change of fuel filter.

This icon shows the total cumulative time since the last time the fuel filter was changed.

a6. HYDRAULIC FILTER CUMULATIVE TIME

256Hr **AFT**
HYD **FIL** **CH**

256 hours have elapsed since the change of hydraulic oil filter.

This icon shows the total cumulative time since the last time the hydraulic oil filter was changed.

a7. HYDRAULIC OIL CUMULATIVE TIME

256Hr **AFT**
HYD **OIL** **CH**

256 hours have elapsed since the change of hydraulic oil.

This icon shows the total cumulative time since the last time the hydraulic oil was changed.

a8. TRAVEL INDEPENDENT MODE DISPLAY

**TRAVEL
INDEP. MODE**

This icon will be displayed every time the independent travel mode is activated (Only on Dynamic Acera excavators manufactured by KCMALLC).

b. Warning Displays

WARNING DISPLAYS

The monitor alarm will sound the instant #2, #5, #6, #7, #10 and #28 warning icons are displayed.

b1. I.T.C.S. CONTROLLER- CPU DISPLAY

1 **CPU** **MECHATRO**
CONT. FAIL

This icon will display when a problem exists in the I.T.C.S. (Intelligent Total Control System).

Turn Key switch "OFF", wait for 4 seconds until the system shuts down completely, then turn the switch back to "ON" to reset the CPU program. Should this icon remain on display, stop operation, shut down the engine, and refer to part "C1" (Swing parking brake release and hydraulic back up system) in this section for temporary operation. Contact a Kobelco technician for repairs.

b2. SWING PARKING BRAKE RELEASE DISPLAY

2 **SWINGBRAKE**
DISENGAGED

Turn the "Slewing Parking Brake Release Switch" on the rear side of operator's seat to the "RELEASE" position, and this warning is displayed.

While this warning is displayed, the swing parking brake does not actuate. This switch should be used only in the event of emergency. Refer to part "C1" (Swing parking brake release and hydraulic back up system) in this section for temporary operation. Contact a Kobelco technician for repairs.

b3. ENGINE PRE-HEATING DISPLAY

4 **E/G**
PREHEAT

This symbol is displayed when key switch is turned to heat position and the engine preheat circuit is activated.

This display goes out at completion of pre-heating, at which time FINISH PREHEAT is displayed.

b4. ENGINE PRE-HEAT COMPLETE DISPLAY

5 **FINISH**
PREHEAT

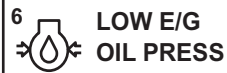
This icon is displayed when the PRE-HEAT is completed. The monitor alarm will sound continuously.

If alarm can't be cancelled by the buzzer stop switch, turn the ignition key to the OFF position, wait for 4 sec's until the electrical system is turned off completely. Then start the engine. Continuous preheat after this icon is displayed could cause damage to the engine.

NOTE

Do not operate the preheat position of the key switch for more than 20 seconds at one time.

b5. ENGINE OIL PRESSURE DISPLAY



This icon will display and the alarm will sound should the Engine Oil Pressure drop below a safe operating pressure.

Stop the engine immediately and check engine oil level. Fill engine to proper level with approved motor oil. **If engine has LOW OIL PRESSURE, it will automatically go to "LO" Idle, and immediately shut down.**

This icon will Display only if alternator is charging.

b6. ENGINE COOLANT TEMPERATURE DISPLAY



This icon will display and the alarm will sound should the Engine Coolant Temperature rise above safe operating temperature.

Reduce engine RPM to idle and stop operation until engine coolant temperature reaches a safe operating temperature range.

b7. ENGINE AIR CLEANER DISPLAY



This icon will display should the Engine Air Cleaner Element(s) (FILTERS) become too dirty to allow proper air flow to the engine.

Should this icon display stop engine immediately and clean or replace Engine Air Cleaner Element(s) as required. This icon will Display only if alternator is charging.

b8. OVER LOAD ALARM DISPLAY (Europe only)



This icon will display and the Buzzer will sound should the Boom Cylinder Circuit Pressure exceed the set, specified pressure.

Should this icon display and the buzzer sound, immediately stop all operation, stop engine and contact an authorized KOBELCO Service dealer for service assistance.

b9. BATTERY CHARGING SYSTEM DISPLAY



This icon will display the electrical charging system not function properly. Should this icon display, have the electrical charging system repaired immediately.

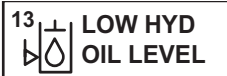
Icon displays only when engine is running with normal oil pressure and a problem occurs in the charging system.

b10. FUEL LEVEL DISPLAY



This icon will display should the Fuel Level in Fuel Tank reaches 54 L (14 Gal) on SK210LC-6E and 60 L (16 Gal) or less for the SK250LC/SK290LC/SK330LC-6E. Should this icon display refill fuel tank immediately using approved diesel fuel.

b11. HYDRAULIC OIL LEVEL DISPLAY



This icon will display should the Hydraulic Oil Level in hydraulic oil reservoir fall below safe operating level.

Should this icon display before starting engine, place machine in Hydraulic Oil Check position and check hydraulic oil level. Refer to Section 4 for proper instructions to fill hydraulic reservoir to proper level using approved hydraulic oil. **This icon will not display during machine operation and a loss of hydraulic oil is experienced.**

b12. ENGINE COOLANT LEVEL DISPLAY



This icon will display should the Engine Coolant Level fall below safe operating level.

Should this icon display before starting the engine, check and fill coolant level in the radiator and coolant reservoir. Icon will not display if alternator is charging and a sudden loss of coolant is experienced.

b13. ENGINE OIL LEVEL DISPLAY



This icon is displayed when the engine oil level of the engine oil pan is low. Check the engine oil level immediately and make up the shortage of the engine oil.

This icon will not display with engine running and a loss of engine oil is experienced.

b14. ATTACHMENT BOOST PRESSURE DISPLAY



This icon will display when the Power Boost Switch is depressed. This icon is displayed only when this system is activated during operation.

b15. HEAVY LIFT PRESSURE DISPLAY



This icon will display when the Heavy Lift Switch is in the "ON" position. This icon is displayed only when this system is activated during operation.

b16. AUTO WARMING UP DISPLAY



This icon is displayed to indicate the warming up operation of the engine and hydraulic oil when this system is activated.

Turn off the auto warm up switch, or the key switch OFF to cancel the warm up system and the display disappears.

SUPPLEMENTARY EXPLANATION

The LCD of gauge cluster on the machines for Europe displays only the ISO STD warning icons (Codes No. 1 to 19).

b17. AUTO WARMING UP FINISH DISPLAY



This icon is displayed when the warming up of the engine and hydraulic oil is finished or when the warming up system is forced to stop.

The monitor alarm will sound continuously for 5 seconds.

b18. REPLACE ENGINE OIL DISPLAY



This icon will display every 500 hours of machine operation to remind operator of scheduled engine oil change.

The recommended oil change interval for MITSUBISHI engines is every 500 hours of operation. Proceed with engine oil change and make sure to recalibrate the engine oil change interval.

b19. HYDRAULIC PRESSURE DRAIN DISPLAY



This icon will display when the hydraulic system pressure drain is activated. The alarm will sound intermittently during the draining process.

b20. HYD. PRESSURE DRAIN FAIL DISPLAY



This icon will display when the hydraulic system pressure drain process fails. The alarm will sound continuously.

Turn the ignition key OFF to cancel the alarm and repeat hydraulic pressure drain procedure before servicing the machine.

MINOR CHANGE MACHINE FAMILIARIZATION

The following chart is provided to familiarize personnel with the priority of the Monitor Display Icons. Pay close attention to these icons as they can help in avoiding unnecessary repairs and expense.

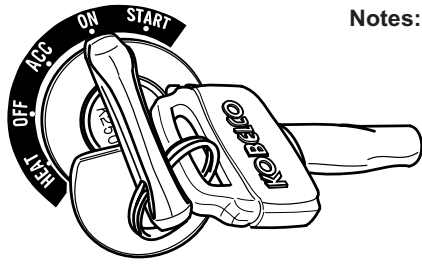
The icons in the chart below are listed in priority from the most serious to least serious.

EXAMPLE: If the engine oil pressure is abnormal and Fuel level is low, the engine oil pressure Icon will display and buzzer will sound. After the oil pressure is back to safe operating pressure, the low fuel Icon will display.

LCD DISPLAY	SERVICE FUNCTION ICON SEQUENCE	MONITOR ALARM
Normal Display	Machine status display MONITOR SYSTEM OK Time display 14 : 20 1920Hr AFT HYD OIL CH 256Hr AFT FIL CH 256Hr AFT FUEL FIL CH 256Hr AFT E/G OIL CH 1515 RPM Time display 14 : 20 Within 5 sec. (Automatically) Tachometer display	ALARM NOT ACTIVE Use to ensure the time of the replacement for the inspection, service, etc. When pressing the screen change switch, make sure to hold switch down for 0.5 sec. to properly change the screen display. Machine normally starts in M mode, except the long reach option machine. Long reach machine starts in A mode.
Asist Mode Display	Digging mode Leveling mode Spreading mode Tamping mode Clock icon 10:10	ALARM NOT ACTIVE ¥For the description of display of the work mode, refer to Section 3. Each display flickers during this mode.
B (Breaker) Mode Display	FLOW RATE $\Delta\Delta\Delta$ L/min A M B H F	Flow rate can be adjusted. Double pump flow can be selected.
Independent Travel Mode Display	TRAVEL INDEP. MODE A M B H F	ALARM NOT ACTIVE Travel control pedals must be in neutral before activating function
Warning	1 CPU MECHATRO CONT. FAIL 2 SWINGBRAKE DISENGAGED 4 E/G PREHEAT 5 FINISH PREHEAT 6 LOW E/G OIL PRESS 7 HIGH E/G COOL TEMP 8 REST'D E/G OIL FILTER 9 REST'D AIR CLEANER 10 ATTACHMENT OVER LOAD 11 CHARGING PROBLEM 12 LOW FUEL LEVEL 13 LOW HYD OIL LEVEL 14 LOW E/G COOL LEVEL 15 LOW E/G OIL LEVEL 19 POWER BOOST ON 20 HEAVY LIFT 21 WARMING UP WARM 28 FINISH WARM 29 CHANGE E/G OIL 32 DRAINING HYD. PRESS 33 FAIL DRAIN HYD. PRESS	¥Alarm activates when icons #2, #5, #6, #7, #10, #28, #32, and # 33 display. Supplementary Explanation: ¥ Icons #5 and #6 are displayed and the monitor alarm does not stop even if the buzzer stop switch is pressed. When icon #6 is displayed, the engine RPM will idle immediately and the engine will shut down after 5 seconds. ¥When icon #7 is displayed the alarm activates and can be deactivated by pressing the buzzer stop switch. ¥Icons #2, #3, #10, and #28 are displayed and alarm activates intermittently and stop sounding after 5 seconds.

YQ102MonitorDisplayIcons

9. Preventive Maintenance Program – FIGURE 2.12A



- Notes:**
1. The engine oil change warning display default setting is 500 hours, but no alarm sounds.
 2. The ITCS system does not have warning display icons nor alarm sound for fuel filter, hydraulic oil filter, and hydraulic oil. **Press the Screen Change switch to obtain the hours elapsed since the last maintenance.** The display hours on the LCD are set to 4 digits for hydraulic oil, and 3 digits for all others.
 3. The display time on the LCD can be returned to zero by simultaneously pressing and holding the "MODE" selector switch and "Buzzer Stop" switch for 5 seconds.

Note: If **CONTRAST 50** is displayed on the screen, press " " to cancel Contrast adjustment mode and continue normal PM adjustment.

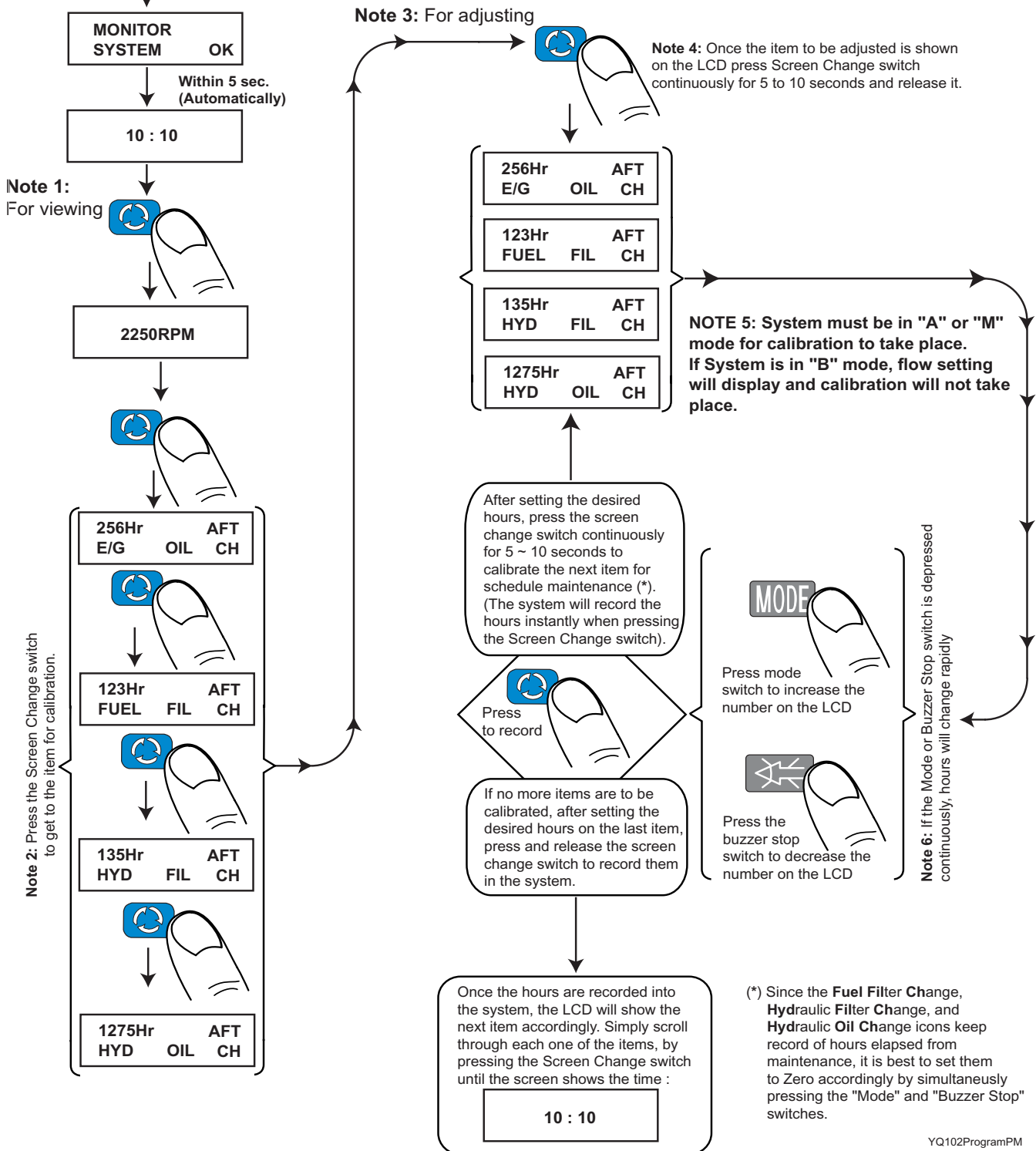


FIGURE 2.12A

YQ102ProgramPM

10. Monitor Time Adjustment – FIGURE 2.13A

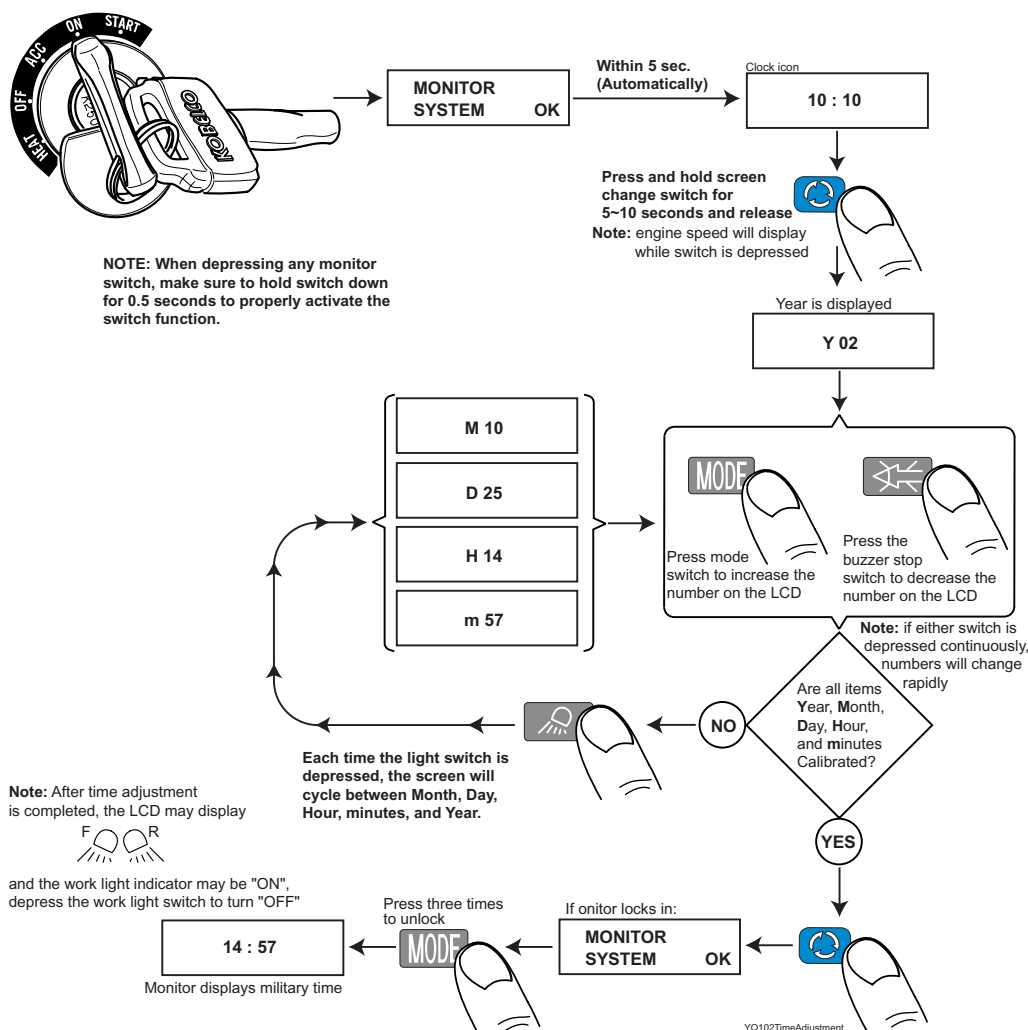


FIGURE 2.13A

11. LCD Contrast Adjustment – FIGURE 2.13B

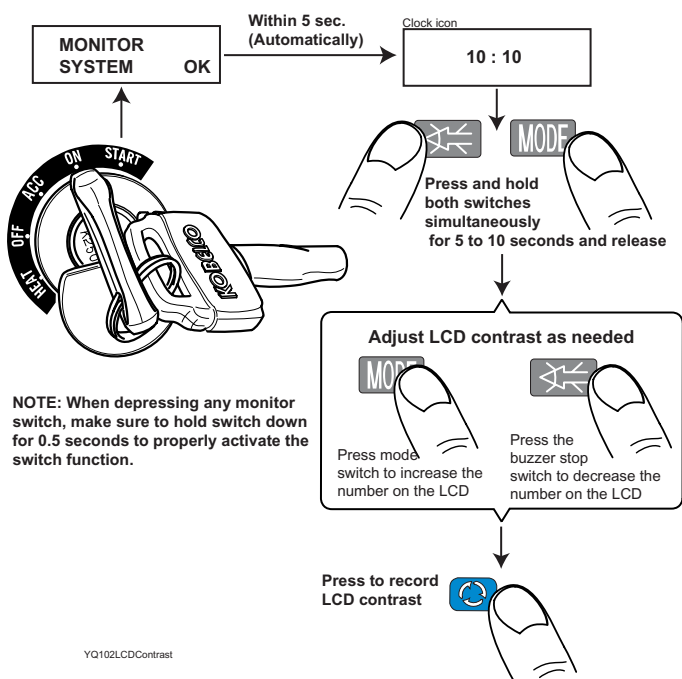


FIGURE 2.13B

12. Changing Warning Display Language – FIGURE 2.13C

NOTE: Language selected in system can be checked by turning key switch to "HEAT" position.

Press switch and simultaneously turn the ignition key to ON

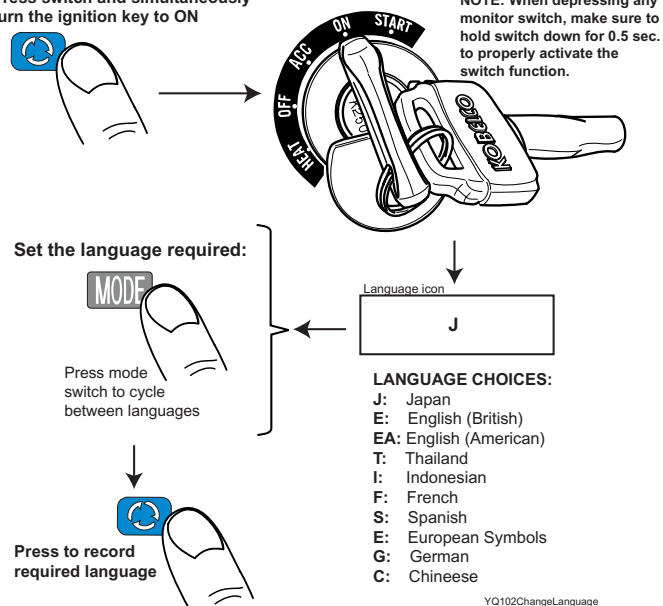


FIGURE 2.13C

14. Draining Hydraulic System Pressure – FIGURE 2.15A

A new convenient feature is now incorporated in the mechatronics system of the Dynamic Acera minor change excavators to help the operator release the system pressure in the hydraulic system directly from the operator's cab for machine service or to switch auxiliary attachments. Proceed as follows to release hydraulic system pressure:

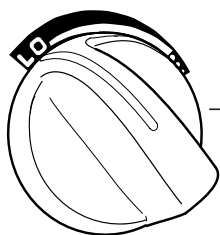
- With engine running and attachment placed on the ground and the throttle potentiometer at low idle, press and hold the screen change switch () and the buzzer stop switch () simultaneously for at least 5 seconds. (See Figure 2.15A) . The engine speed will switch to low idle and the monitor display will show “  ”, and the monitor alarm will sound intermittently. (Alarm is normal condition)

WARNING

MAKE SURE TO STABILIZE THE ATTACHMENT ON THE GROUND BEFORE ACTIVATING THE HYDRAULIC PRESSURE DRAIN SYSTEM

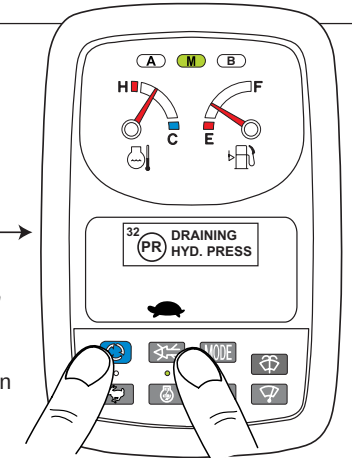
FIGURE 2.15A

Engine running with throttle potentiometer in low idle



NOTE: The monitor alarm can be turned off with the buzzer stop switch.

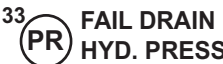
YQ102DrainHydSystem



Press and hold Screen Change and Buzzer Stop switches simultaneously for 5~10 seconds and release

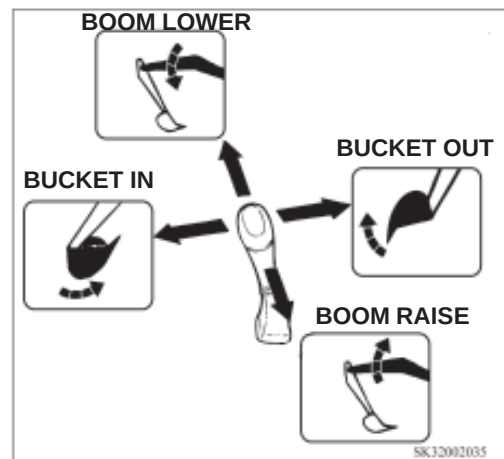
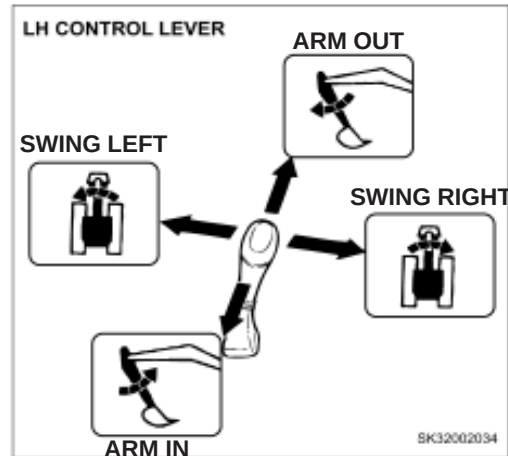
WARNING

While releasing the hydraulic system pressure, if the monitor displays:

 **FAIL DRAIN HYD. PRESS**

and the monitor alarm sounds continuously, turn the ignition switch to the OFF position to shut down the engine. The alarm will quit sounding and the monitor display will disappear 4 seconds after the key switch is turned OFF. Repeat the process again starting from step a.

Do not attempt to service the machine or switch auxiliary attachments without releasing the hydraulic system pressure.



- Operate all control levers, corresponding to the circuits required including Travel and Auxiliaries, several times to release the system pressure.
- Turn the ignition switch to the OFF position to shut-down the engine. The alarm will quit sounding and the monitor display will disappear 4 seconds after the key switch is turned OFF. (Figure 2.15B)

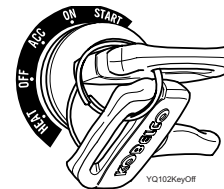


FIGURE 2.15B

- Press the hydraulic tank pressure relief valve and proceed to service or change auxiliary attachments.
- As long as screen #33 “Fail Drain Hyd. Press” does not show on the cluster gauge procedure is complete. If icon appears repeat procedure.

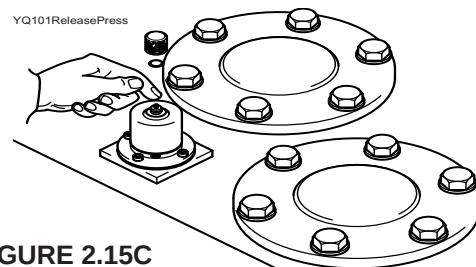


FIGURE 2.15C

MINOR CHANGE MACHINE FAMILIARIZATION

A4. Power Boost Switch – FIGURE 2.15D

Located on the right hand control lever, this switch should only be used for increased break out force during digging.

NOTE

Use of power boost is prohibited when arms longer than standard are installed.

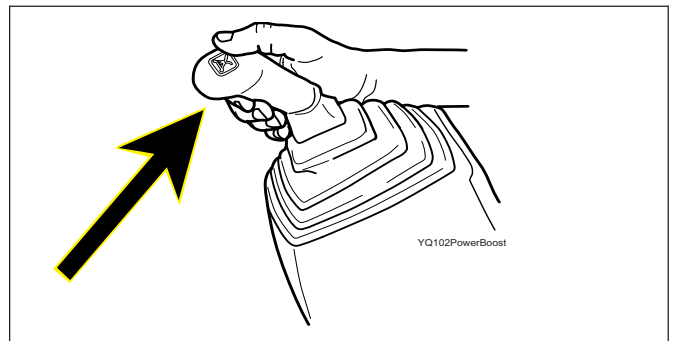


FIGURE 2.15D



WARNING

DO NOT USE POWER BOOST FOR LIFTING OPERATIONS. INSTEAD, USE THE HEAVY LIFT SWITCH



CAUTION

Do not use the cigarette lighter as a power source for 12 volt accessories. It is 24 volt outlet. Plugging a 12 volt accessory into a 24 volt connector may result in shorting and/or Fire.

A6. Location for Optional Switches – FIGURE 2-16B

This additional switch panel is provided on the right side console for any machine customization if desired.

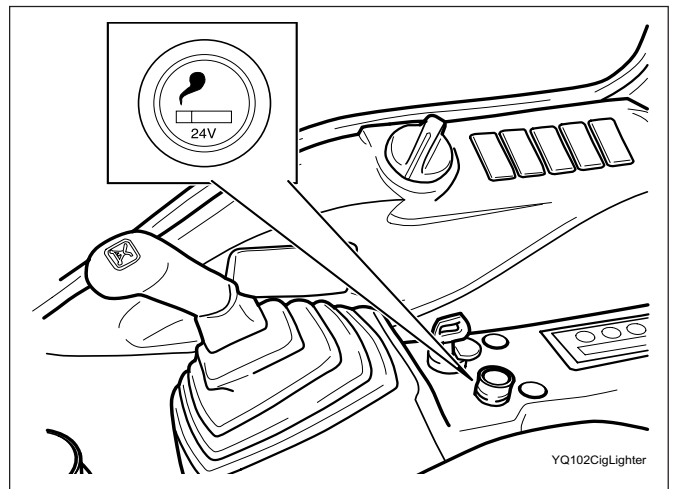


FIGURE 2.16A

A7. Cup Holder and Ashtray – FIGURE 2.16C

A cup holder is provided on the right side panel, below the monitor, and the ashtray is located on right side console, as shown in the figure.

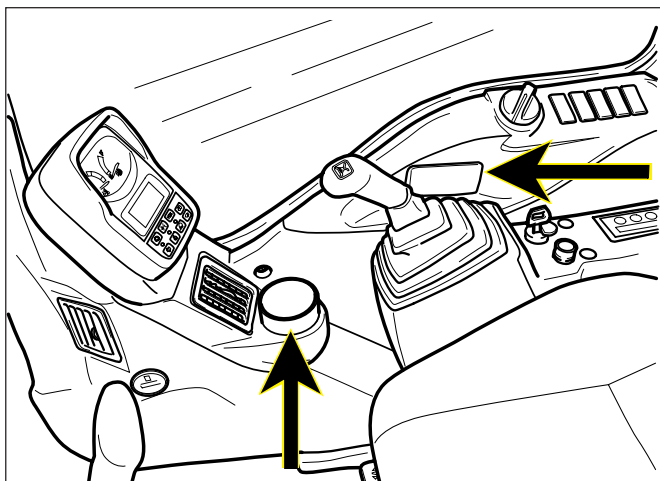


FIGURE 2.16C

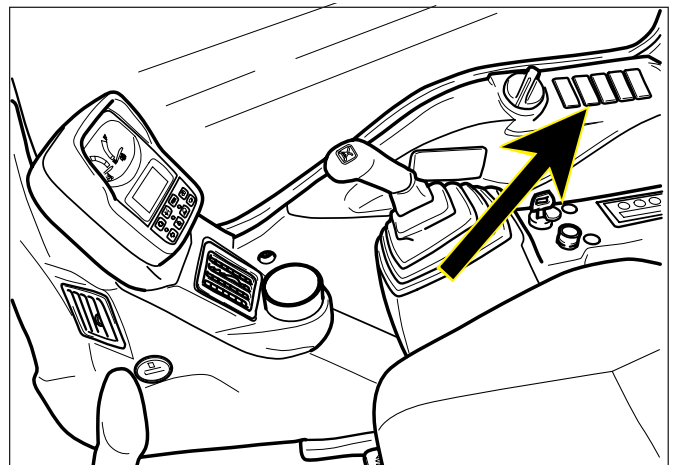


FIGURE 2.16B

A8. 24Vdc Radio – FIGURE 2.17A

The radio is located on the right side control panel as indicated in Figure 2.17A. The LCD Display shows the radio station frequency as well as clock time. Radio is DIN Spec. after Minor Change.

1. Control Switches

The following table describes the different functions available to use the radio:

SWITCH	FUNCTION AND USAGE
1	Power switch and volume control
2	Tone control
3	FM & AM selector
4	Time set button
5	Station selector
6	Preset selector buttons
7	LCD display
8	Time adjusting buttons

2. How to select stations – FIGURE 2.17B

a. How to select the radio station manually:

Press the Power switch to turn on the radio and press the station selector buttons up or down to select the desired radio station. This radio functions in two main frequency bands: AM and FM. When the frequency band reaches the upper or lower limit, the radio automatically switches to the opposite limit, that is: from the upper to the lower or vice versa.

b. How to preset the radio stations:

Once the desired radio station is selected manually, press any of the preset station buttons (1 ~ 6) for more than 1.5 sec to record it in its respective memory. The reception is temporarily lost during the memorization process. Once the reception is recovered, the station is preset on the desired preset station button. Repeat this procedure to preset a total of 6 different radio stations.

NOTE

The preset stations are canceled when the radio is removed for maintenance or the batteries are disconnected.

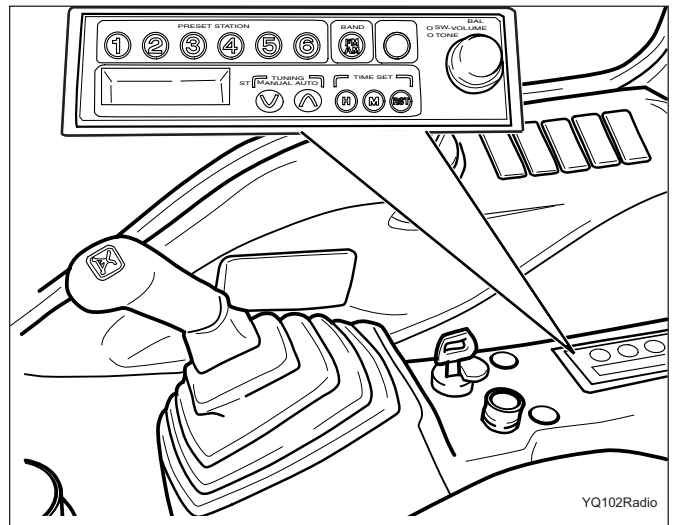


FIGURE 2-17A

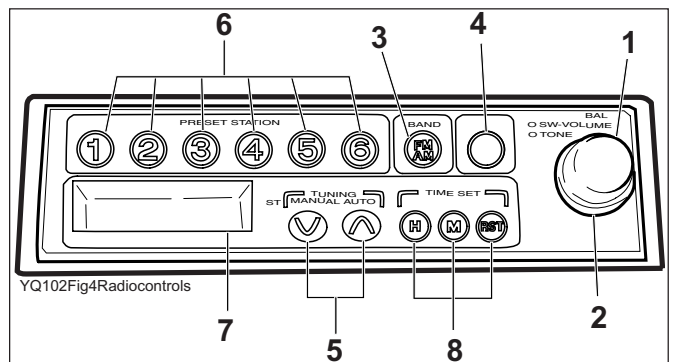


FIGURE 2-17B

3. How to adjust the clock

- After the radio is turned on, press button (4) to activate the time function. Then press buttons (8): H, M, and RST to set the time accordingly. Use H to set the hour and M to set the minutes.

NOTE

The radio LCD screen will return to normal functioning after 5 seconds of inactivity on the time control buttons.

- The RST button works as follows: (If trying to adjust time to 10:00 hours)
 - If minutes are within 0 and 29: when pressing RST button, minutes will be taken to "10:00". Then press (M) to set the proper minutes.
 - If minutes are within 30 and 59: when pressing RST button, minutes will be taken to "10:30". Then press (M) to set the proper minutes.

B. LEFT HAND OPERATOR CONSOLE

B1. Climate Control Air Conditioner – FIGURE 2.18A and 2.18B

The climate control-AC provides a comfortable indoor environment and adjustable control of cab temperature. It removes moisture from humid air and reduces window glass fogging.

The climate control-AC is installed behind operator's seat and sends cold air or hot air into cab.

Air Outlet Selector

Select a preferable air diffuser direction that is most comfortable moving the grill by hand.

(A), (B), (C), (D) ... Air outlet

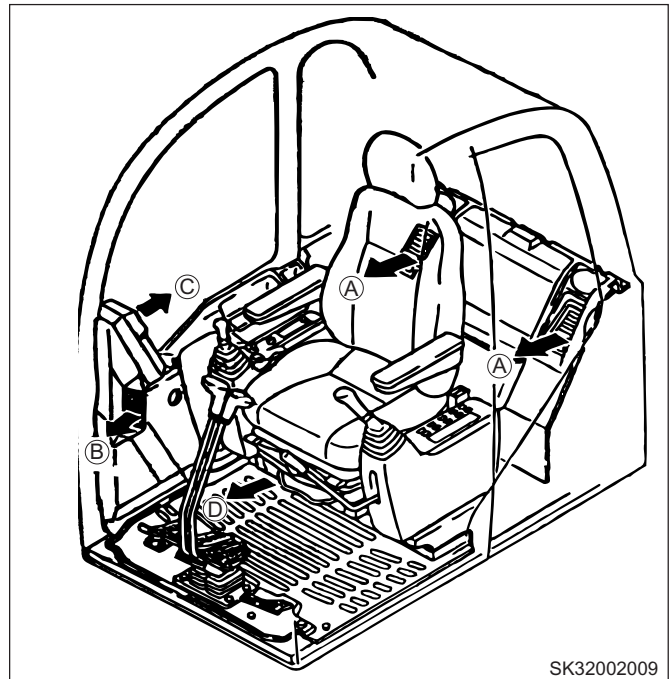


FIGURE 2.18A

I. Control Panel Description

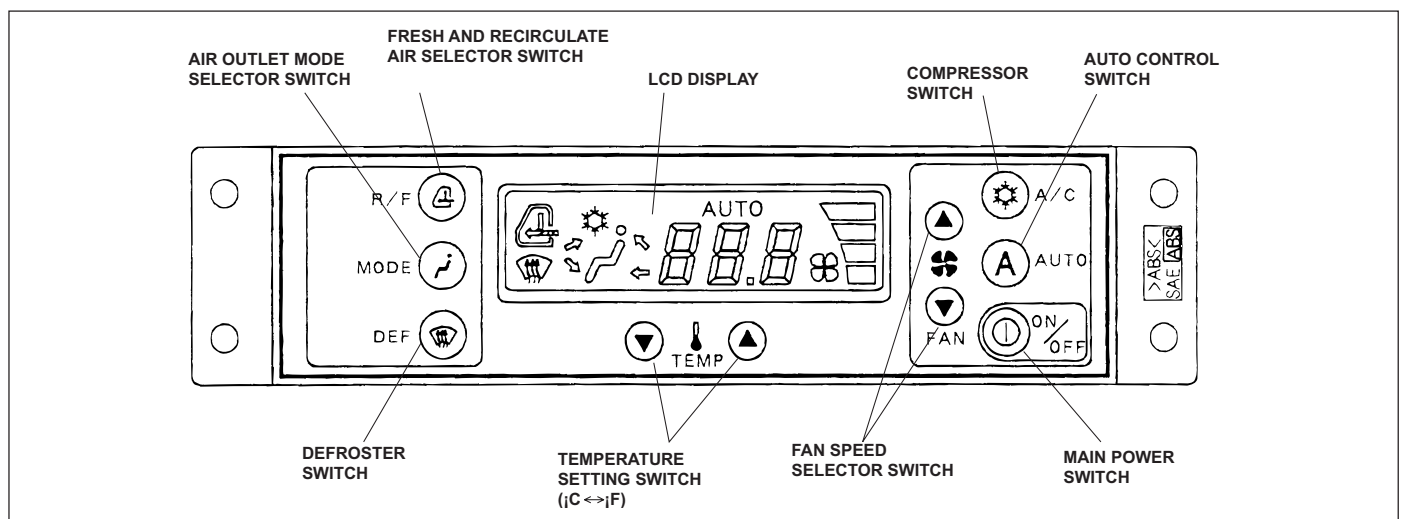


FIGURE 2.18B

SUPPLEMENTARY EXPLANATION

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

The background of the control panel is illuminated whenever the A/C system is activated.

II. Fundamental Use – FIGURE 2.18B

Before turning the air conditioner on, close the door and windows to achieve the best performance.

1. Press the "AUTO" control switch 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 AUTO indicator in the LCD display will come on.

The outlet temperature, outlet opening and fan speed are adjusted automatically so that indoor temperature of the 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 "AUTO" indicator in the LCD display goes out. Press "AUTO" switch to return to automatic climate control.

B4. Auto Warm Up Selector Switch – FIGURE

2.22A

Before turning the ignition switch to the ON position, turn on the warm up switch located on the left panel and then start the engine.

NOTE

The Auto Warm Up System will not activate if the Ambient temperature is above 10 °C (50 °F).

1. Warming up of engine

The “WARMING UP” is displayed on the multi display after operating the engine for 3 minutes at auto accel speed (1050 rpm.) when the accel dial set value is the value for deceleration or lower, the engine speed returns to the speed set by the the throttle potentiometer.

2. Warming of hydraulic oil

The warm up operation will be done as follows: pump max. flow rate at the engine speed (1050 rpm) for 3 minutes → pump max. flow rate (control valve closed) at the engine speed (1600 rpm) for 5 minutes → pump max. flow rate and control valve fully open at the engine speed (1600 rpm) for 5 minutes → max. flow rate at the engine auto accel speed (1050 rpm) for 10 minutes, “WARMING UP” is displayed on the multidisplay.

3. Warming up complete

After an elapsed time of about 26 minutes of warming of hydraulic oil, or when the hydraulic oil temperature switch turns OFF, The WARMING UP indication(“WARMING UP”) on the multidisplay disappears and the buzzer sounds for 5 seconds. Turn the auto warm up switch OFF.

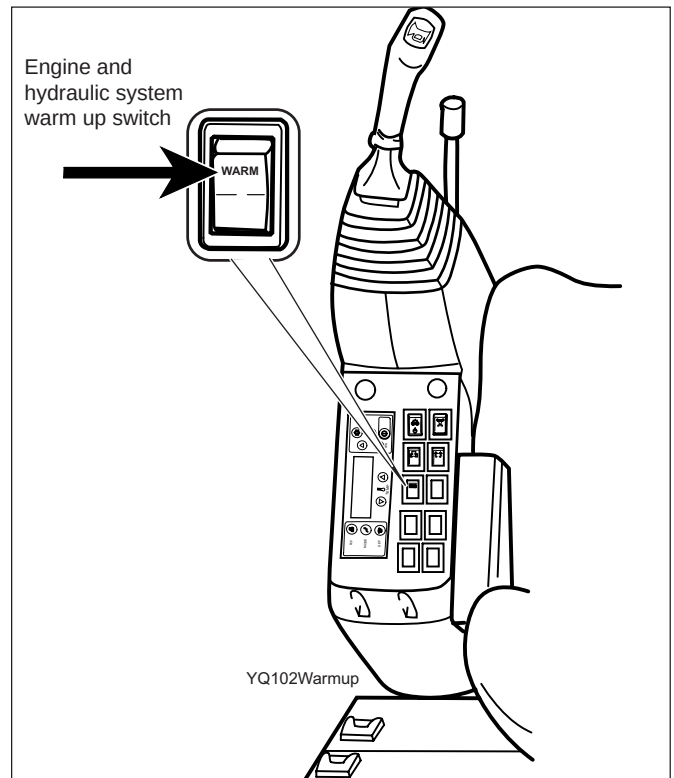


FIGURE 2.22A



CAUTION

AUTO WARM-UP SHOULD BE UTILIZED ANYTIME MACHINE IS STARTED IN CLIMATE TEMPERATURES BELOW 10 °C (50 °F) TO STABILIZE MACHINE CONTROL RESPONSE. COLD OIL CAN CAUSE ERRATIC MACHINE OPERATION.

NOTE

1. If a pilot control lever is activated while the warm up system is active, the warm up system is disconnected. The warm up system will restart after 10 sec. of neutral condition in the pilot control system.
2. If the Auto warm up switch is pressed to the OFF position, the warm up system is disconnected.
3. In climates below -18 °C (0 °F) it may be necessary to use a coolant heater, fuel heater, engine heater jacket and/or additional battery power to aid in starting the engine.

B5. Independent Travel Select Switch – FIGURE 2.23A

The independent travel select switch is located on the left hand control console. Use this function where fine metering of simultaneous travel and attachment operations are required. Travel control levers/pedals must be in the neutral position before activating this switch.

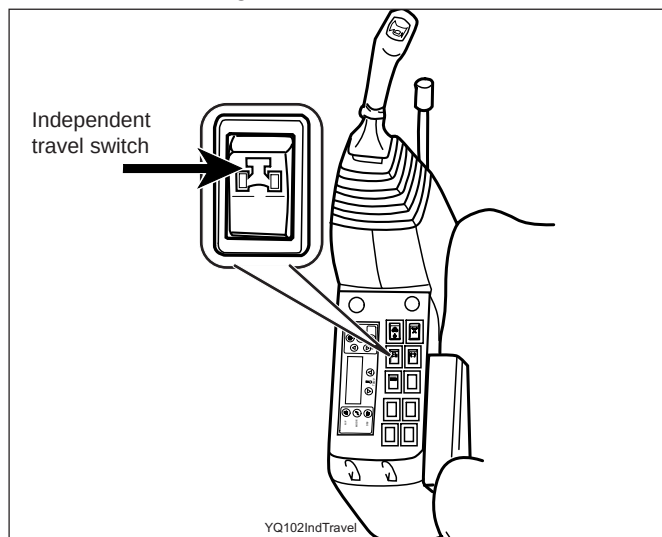


FIGURE 2.23A

B6. Heavy Lift Switch – FIGURE 2.23B

The heavy lift switch is located on the left hand control console. The heavy lift switch has 2 operating positions. The heavy lift function is used when precision control of heavy lifting operations are required.

1. "ON" – Push the symbol side of switch down to turn heavy lift function on.
2. "OFF" – Push back of switch down to turn heavy lift function Off.

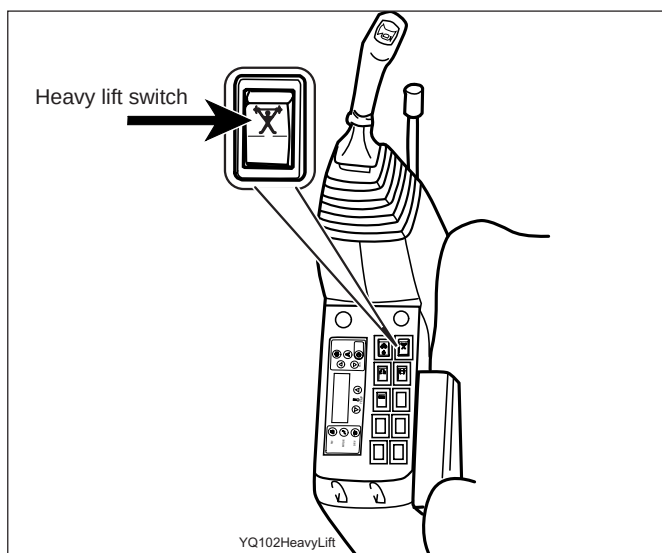


FIGURE 2.23B

! DANGER

NEVER TURN OFF HEAVY LIFT SWITCH DURING ANY HEAVY LIFTING OPERATION. SUDDEN OR UNEXPECTED LOAD MOVEMENT COULD RESULT IN SERIOUS INJURY OR DEATH.

B7. Swing Flasher Switch – FIGURE 2.23C

The swing flasher switch is located on the right hand operator console. The swing flasher is a 2 position rocker switch which is used to turn on the swing flashers.

- "ON" – Push the symbol side of switch down to turn the swing flashers ON.
- "OFF" – Push the empty side of switch down to turn the swing flashers OFF.

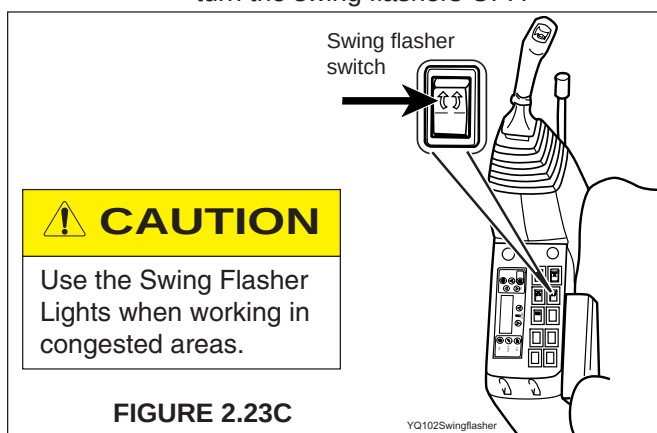


FIGURE 2.23C

B8. Double Pump Flow Selector Switch– FIGURE 2.23D (Optional for SK290LC/SK330LC-6E)

Use this switch, provided on the left side control panel, to select a single or double pump flow to the auxiliary system.

- a. Press it forward to activate the double pump flow for the auxiliary system.
- b. Press it backward to cancel the double pump flow and activate the single pump flow for the auxiliary system.

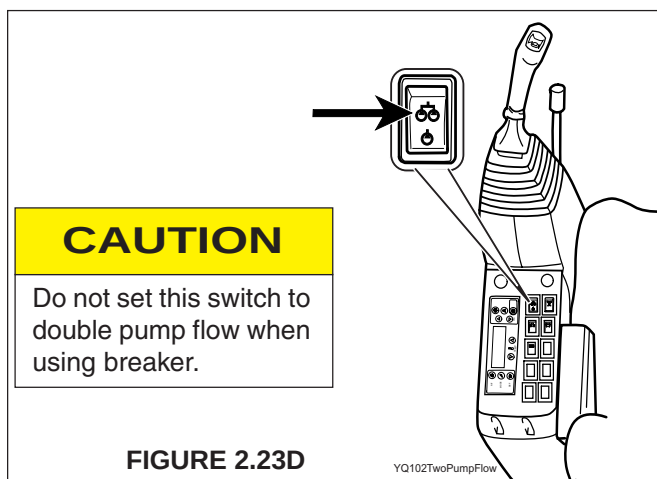


FIGURE 2.23D

C. REAR PANEL AND OTHERS

C1. Swing Parking Brake Release Switch and Hydraulic Back Up System

When ever the “CPU MECHATRO CONT. FAIL” is displayed on the LCD screen, use the swing parking brake release switch to release the swing parking brake while the machine is running. To release the swing parking brake, proceed as follows:

1. Stop the engine, see Figure 2.24A.

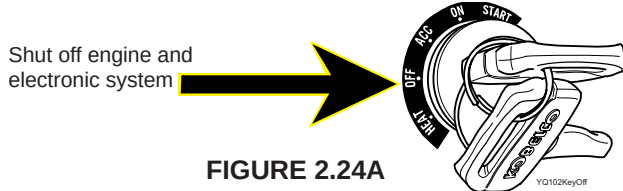


FIGURE 2.24A

2. Remove the covers for the control panel located behind the operator's seat, see Fig. 2.24B:

- › Remove the rear panel upper cover screws (4) and press the lower locks to release the cover. Tilt cover forward to disconnect the speaker wires and 12V adapter wires, see Figure 2.24C, and remove the top cover.

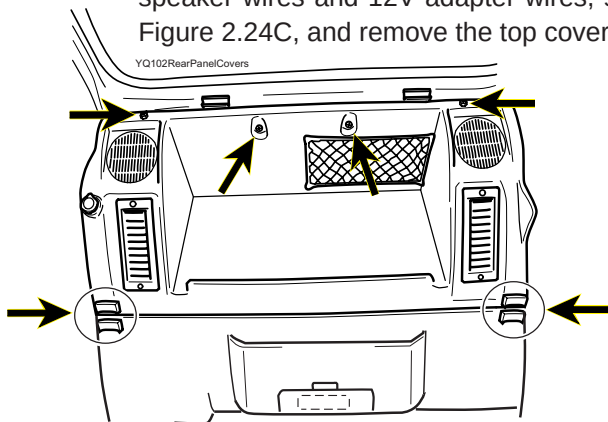


FIGURE 2.24B

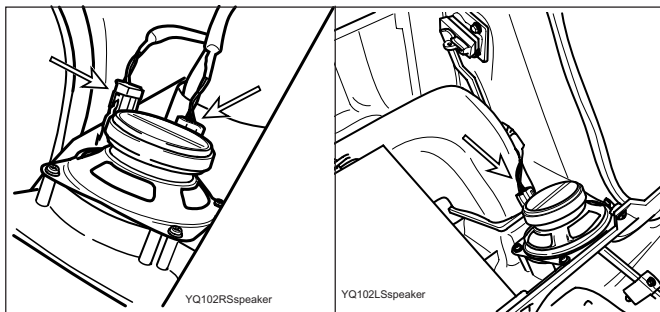


FIGURE 2.24C

- › Press the upper locks to release the top side of the lower cover. Then press the lower locks to release the bottom side of the cover to remove it.

3. Locate the switch to release the swing parking brake and flip it to its release position, see Fig. 2.24D.
4. Install the rear panel covers.

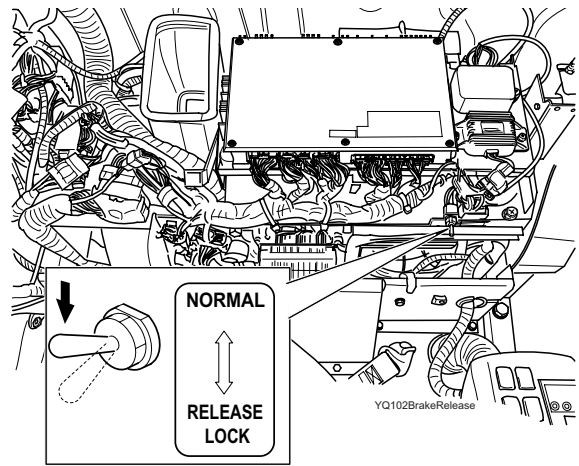


FIGURE 2.24D

5. Use a 13 mm and a 5 mm wrench to back out completely, to stop position, a special screw located on the pump regulators. See Figure 2.24E.
6. Start the engine.

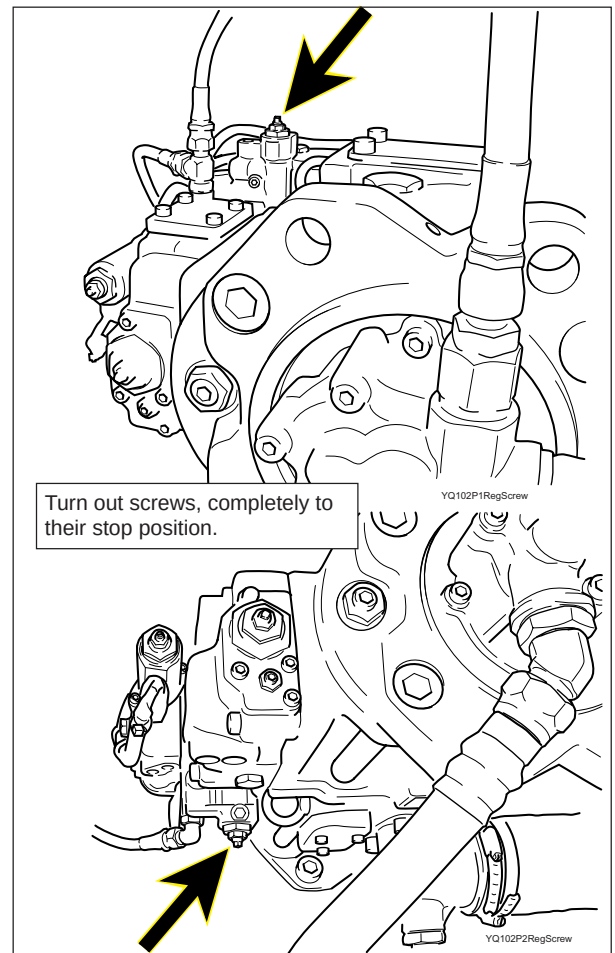


FIGURE 2.24E

NOTE

MACHINE EFFICIENCY WILL BE APPROXIMATELY 85%. Make sure to return these switches to their “normal” position after repairing the Mechatronic System.

C2. 12 Volt Power Supply – FIGURE 2.25A

The 12 volt power supply is located beside the right side switch panel.

For use of common auto accessories such as a fan or other accessories requiring 12 volt(DC) power, pull cover away from 12 volt power supply and insert 12 volt male socket into power supply. Replace cover after use.



CAUTION

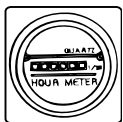
Do not use the cigarette lighter as a power source for 12 volt accessories. It is a 24 volt outlet. Plugging a 12 volt accessory into a 24 volt connector may result in shorting and/or Fire.

MAXIMUM CONTINUOUS OUTPUT – 180 Watt

C3. Fuse Box – FIGURE 2.25B

The fuse box is located behind the operators seat. It contains all necessary fuses for the electrical circuits of the machine. Should it become necessary to inspect or change a fuse, remove the fuse box cover by gently pulling each end away from the box. Should a fuse require replacement, use a replacement fuse of the same type and amperage. Turn key switch to “OFF” and wait approximately 4 seconds for all electrical power to stop before removing or replacing a bad or blown fuse. The fuse cover incorporates a fuse puller to remove fuses. Refer to the Maintenance Section of this manual for a detailed diagram and description of fuse box.

C4. Hour Meter – FIGURE 2.25C



- The hour meter indicates the total time that the engine has run. It meters the time continuously as long as the engine is running.

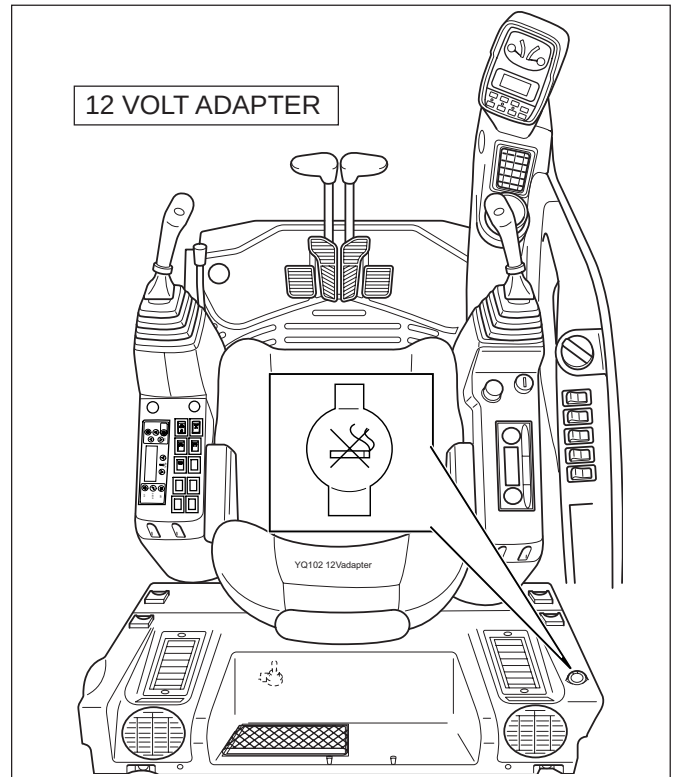


FIGURE 2.25A

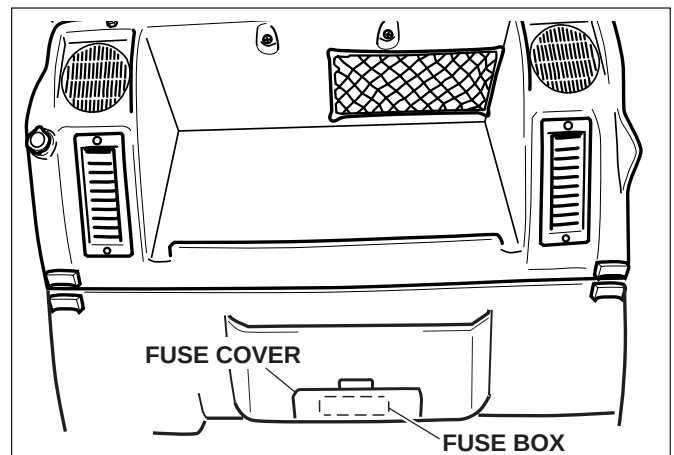


FIGURE 2.25B

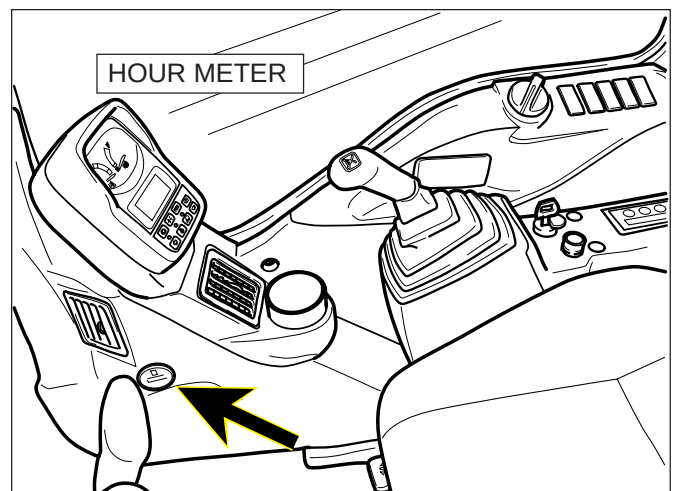


FIGURE 2.25C