KOBELCO

SERVICEMAN'S HANDBOOK

HYDRAULIC EXCAVATOR

MARK IV

KSOH-IV-USA-REV.0-04/99 03/04

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TORQUE SPECIFICATIONS

A. CAPSCREWS & NUTS

1. Metric Coarse Thread Standard Tightening Torque Values. Make certain to tighten all Capscrews & Nuts to proper torque values.

Classification		4	T	7	T	10	T
NOMINAL SIZE		NO LUBRICATION	OIL LUBRICATION	NO LUBRICATION	OIL LUBRICATION	NO LUBRICATION	OIL LUBRICATION
M8	P=1	0.45±0.05 (3.2±0.4)	0.38±0.04(2.7±0.3)	0.98±0.1 (7.1±0.7)	0.83±0.09 (6.0±0.6)	1.77±0.18 (12.8±1.3)	1.5±0.15 (01.8±1.1)
M8	P=1.25	1.09±0.11 (7.9±0.8)	0.92±0.09 (6.6±0.7)	2.4±0.2 (17.3±1.4)	2.0±0.2 (14.4±1.4)	4.3±0.4 (31.0±2.9)	3.6±0.4 (26.0±2.9)
M10	P=1.5	2.2±0.2 (15.9±1.4)	1.83±0.18 (13.2±1.3)	4.7±0.5 (33.9±3.6)	4.0±0.4 (28.9±2.9)	8.5±0.9 (61.3±6.5)	7.2±0.7 (52.0±5.1)
M12	P=1.75	2.2±0.2 (25.7±2.9)	3.2±0.3 (23.1±2.2)	8.1±0.8 (58.5±5.8)	6.8±0.7 (49.1±5.1)	14.6±1.5 (105±10.8)	12.3±1.2 (88.8±8.7)
M14	P=2	5.9±0.6 (42.6±4.3)	5.0±0.5 (36.1±3.6)	12.5±1.3 (92.5±9.4)	10.6±1.1 (79.0±7.9)	23±2 (166±14)	19.5±1.9 (140±14)
M16	P=2	9.0±.09 (64.9±6.5)	7.6±0.7 (54.8±5.1)	19.5±2.0 (140±14.4)	16.4±1.6 (118±11.5)	35±4 (252±28.9)	29±3 (209±21.6)
M18	P=2.5	12.4±1.2 (89.6±8.7)	10.5±1.0 (75.8±7.2)	27±3 (195±22)	23±2 (166±14)	49±5 (354±36)	41±4 (296±29)
M20	P=2.5	17.5±1.7 (126±12.3)	14.7±1.4 (106±10.1)	36±4 (274±29)	32±3 (231±22)	68±7 (491±51)	57±6 (412±43)
M22	P=2.5	23±2 (166±14)	19.5±2.0 (142±14)	51±5 (368±36)	43±4 (310±29)	92±9 (663±65)	77±7 (555±58)
M24	P=3	30±3 (217±22)	24±3 (173±22)	65±7 (468±51)	53±5 (383±36)	118±12 (852±87)	96±10 (693±72)
M27	P=3	44±4 (318±29)	36±3 (260±22)	96±10 (693±72)	78±8 (563±58)	173±17 (1250±120)	140±14 (1010±100)
M30	P=3.5	60±6 (433±43)	50±5 (361±36)	131±13 (946±94)	110±11 (794±79)	235±24 (1700±170)	198±20 (1430±140)
M33	P=3.5	81±8 (585±58)	68±7 (491±51)	176±18 (1270±130)	148±15 (1070±110)	317±32 (2290±200)	266±27 (1920±200)
M36	P=4	105±10 (758±72)	88±9 (636±65)	227±23 (1640±170)	190±19 (1370±140)	343±34 (2480±250)	343±34 (2480±250)

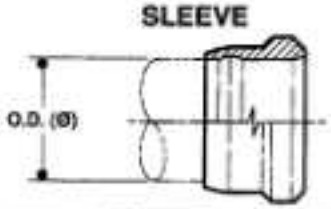
TORQUE VALUE UNIT– kgf-m (ft. lbs.)

2. Metric Fine Thread Standard Tightening Torque Values. Make certain to tighten all Capscrews & Nuts to proper torque values.

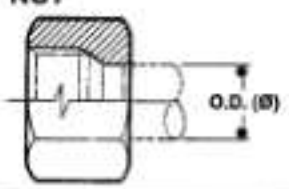
Classification		4	T	7	T	10	T
NOMINAL SIZE		NO LUBRICATION	OIL LUBRICATION	NO LUBRICATION	OIL LUBRICATION	NO LUBRICATION	OIL LUBRICATION
M8	P=1.25	1.15±0.11 (8.3±0.8)	0.97±0.1 (7.0±0.7)	2.5±0.2 (18.0±1.4)	2.1±0.2 (15.2±1.4)	4.5±0.4 (32.5±2.9)	3.8±0.4 (27.4±2.9)
M10	P=1.5	2.3±0.2 (16.6±1.4)	1.91±0.19 (13.8±1.4)	4.9±0.5 (35.4±3.6)	4.2±0.4 (30.3±2.9)	8.9±0.9 (64.2±6.5)	7.5±0.7 (54.2±5.1)
M12	P=1.75	4.0±0.4 (28.9±2.9)	3.4±0.3 (24.5±2.2)	8.7±0.9 (62.8±6.5)	7.3±0.7 (52.7±5.1)	15.7±1.6 (113±13)	13.2±1.3 (95.3±9.4)
M16	P=2	9.4±0.9 (67.9±6.5)	7.9±0.8 (57.0±5.8)	20±2 (144±14)	17.2±1.7 (124±12)	37±4 (267±29)	31±3 (224±22)
M20	P=2.5	19±9 (137±14)	15.8±1.6 (114±14)	41±4 (296±29)	34±3 (246±22)	74±7 (535±51)	62±6 (448±43)
M24	P=3	32±3 (231±22)	27±3 (195±22)	70±7 (506±51)	58±6 (419±43)	126±12 (910±87)	105±10 (758±72)
M30	P=3.5	65±6 (469±43)	54±5 (390±36)	142±14 (1030±100)	118±12 (852±87)	255±26 (1840±190)	212±21 (1530±150)
M36	P=4	109±11 (787±79)	91±9 (657±65)	236±23 (1720±170)	198±20 (1430±140)	428±43 (3090±310)	357±36 (2580±260)

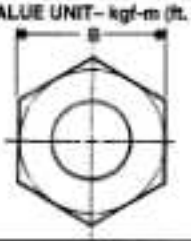
TORQUE VALUE UNIT– kgf-m (ft. lbs.)

SLEEVE



NUT





MANUFACTURER'S NAME	WORKING PRESSURE kgf/cm² (PSI)	TUBE SIZE O.D. X THICKNESS mm (in)	OPPOSING FLATS mm Dimension B	TORQUE VALUE kgf-cm² (ft. lbs.)
NIPPON A.M.C.	300 (4270)	10 X 1.5 (0.394 X 0.059)	19	5±1 (0.36±0.07)
		15 X 2.0 (0.591 X 0.079)	27	12±1.2 (0.88±0.09)
		18 X 2.5 (0.709 X 0.098)	32	15±1.5 (1.09±0.11)
		22 X 3.0 (0.866 X 0.118)	36	22±2.2 (1.59±0.16)
		28 X 4.0 (1.10 X 0.157)	41	28±2.8 (2.03±0.20)
IHARA KOATO	300 (4270)	35 X 5.0 (1.38 X 0.20)	55	45±4.5 (3.25±0.33)

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LUBRICATION SPECIFICATIONS

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

LUBRICANT	CLIMATE ZONE				
HYDRAULIC OIL (ANTI-WEAR, ANTI-OXIDANT AND NON-FOAMING)	FRIGID -30°C ~ 15°C (-22°F ~ 59°F)	FRIGID -20°C ~ 30°C (-4°F ~ 86°F)	FRIGID~WARM -25°C ~ 40°C (-13°F ~ 104°F)	WARM -5°C ~ 40°C (23°F ~ 104°F)	VERY HOT 5°C ~ 55°C (41°F ~ 131°F)
* Mobil DTE13M oil with High Viscosity Index	ISOVG22	ISOVG32	ISOVG32S*	ISOVG46	ISOVG68

LUBRICANT	CLIMATE ZONE		
ENGINE OIL* A.P.I. CLASSIFICATION FOR "SERVICE CE"	FRIGID -30°C ~ 10°C (-22°F ~ 50°F)	WARM -5°C ~ 40°C (23°F ~ 104°F)	VERY HOT 40°C and Above (104°F and Above)
* ALL ENGINES SHIPPED FROM FACTORY WITH SAE15W40 OIL IN ENGINE OIL PAN.	SAE5W30	SAE15W40	SAE15W50

LUBRICANT	CLIMATE ZONE		
FUEL	FRIGID -15°C ~ -25°C (-5°F ~ -13°F)	WARM -5°C ~ -15°C (5°F ~ 23°F)	VERY HOT -5°C and Above (23°F and Above)
	JIS SPECIAL No.3 LIGHT OIL	JIS No.3 LIGHT OIL	JIS No.2 LIGHT OIL

LUBRICANT	
ENGINE OIL (FOR GENERAL PURPOSE LUBRICATION)	FOR ROLLERS AND IDLERS ON ALL MODELS. FOR SWING MOTOR REDUCTION UNIT AND TRAVEL MOTOR REDUCTION UNITS ON THE FOLLOWING MODELS: SK100 ~ SK270 A.P.I. Classification for "Service CE" ~ SAE30

LUBRICANT	
GEAR OIL (FOR SK300 ~ SK460 SWING MOTOR AND TRAVEL MOTOR REDUCTION UNITS)	EXTREME PRESSURE GEAR OIL #90 GRADE GL-4 BY A.P.I. CLASSIFICATION

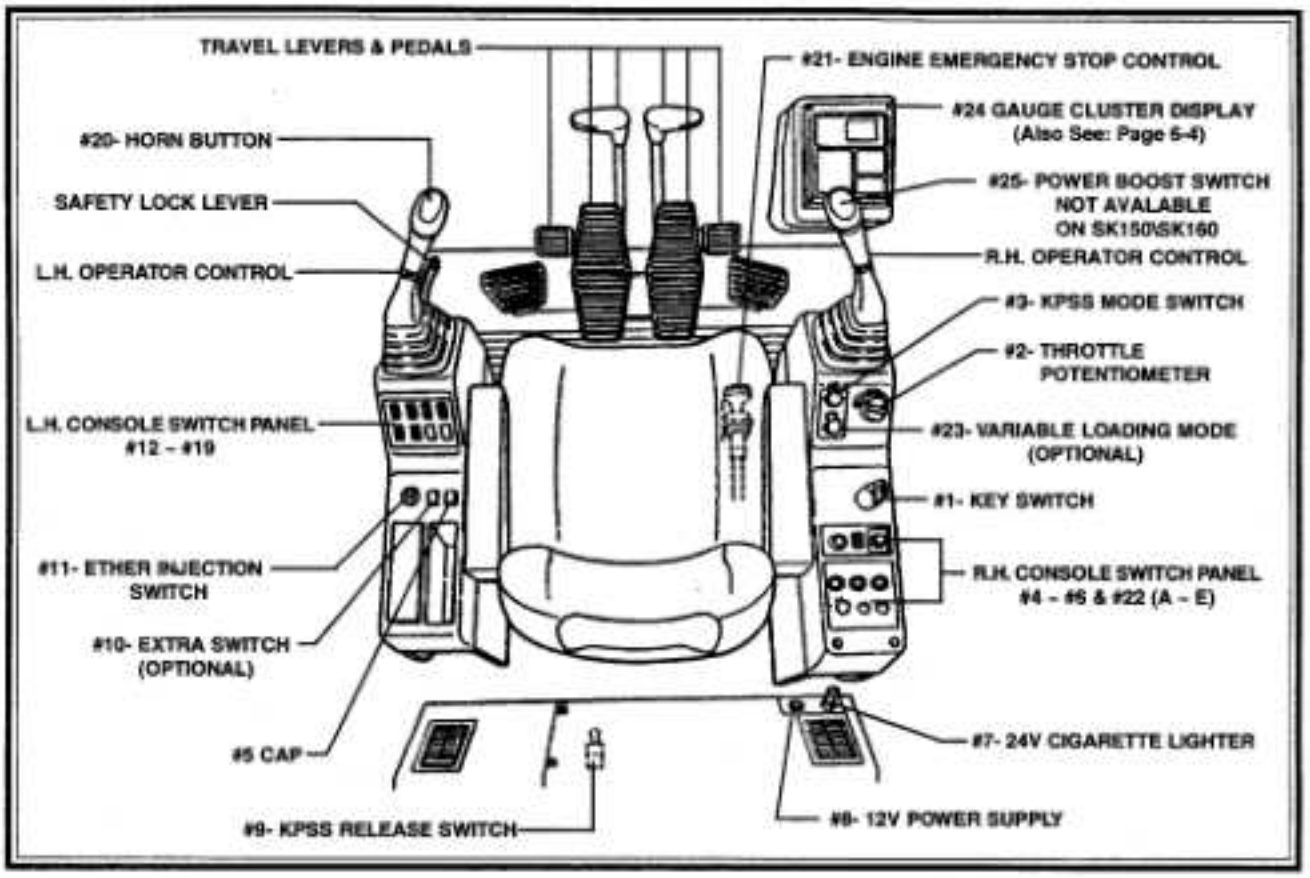
LUBRICANT	GENERAL LUBRICATION	SWING GEAR SUMP (BATH)
GREASE	EXTREME PRESSURE MULTI-PURPOSE GREASE N.L.G.I. No.2 LITHIUM BASE, EP TYPE GREASE	N.L.G.I. No.2 LITHIUM BASE WITH MoS 2 GREASE

LUBRICANT	
ENGINE COOLANT (50% MIXTURE)	ANTI-FREEZE (LLC) -34°C (-29.2°F)

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SK150/160LC ~ SK270LC IV OPERATION AND CONTROLS

The following information is given to locate and explain the function of the Operator Control Switches for the Models SK150 – SK270. Use this information in conjunction with the Electrical Schematics when troubleshooting particular circuits.



1. KEY SWITCH



HEAT – Grid heater air-intake.
OFF – Disconnects electrical power to all electrical components.
ACC – Allows use of electrical accessories.
ON – Supplies electrical power to all machine electrical circuits.
START – Engages starter to allow starting of the engine.

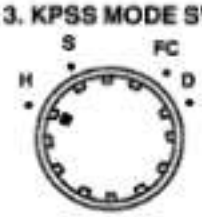
2. THROTTLE POTENTIOMETER



Electrically controls engine RPM, in conjunction with CPU and stepping motor, by rotating switch clockwise or counterclockwise.

LO – Lowest engine RPM, Idle position.
No Load- 850 RPM – 900 RPM
HI – Highest engine RPM, Hi Idle position.
No Load- 2355 RPM – 2405 RPM

3. KPSS MODE SWITCH



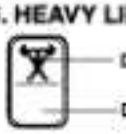
H – For best machine performance in heavy digging operations.
S – Best machine performance and control in light duty operations.
FC – Best performance where precision fine control is required.
D – For fine metering of travel operations.

4. WIPER & WASHER SWITCH



OFF – Turns Wiper "OFF".
– This position allows intermittent operation of wiper.
– This position allows continuous operation of wiper.
PUSH DOWN – Causes washer to spray washer fluid onto windshield.

5. HEAVY LIFT SWITCH



DEPRESS this side to turn Heavy Lift Mode "ON".
DEPRESS this side to turn Heavy Lift Mode "ON".

6. HYDRAULIC OIL TEMPERATURE ALARM LAMP



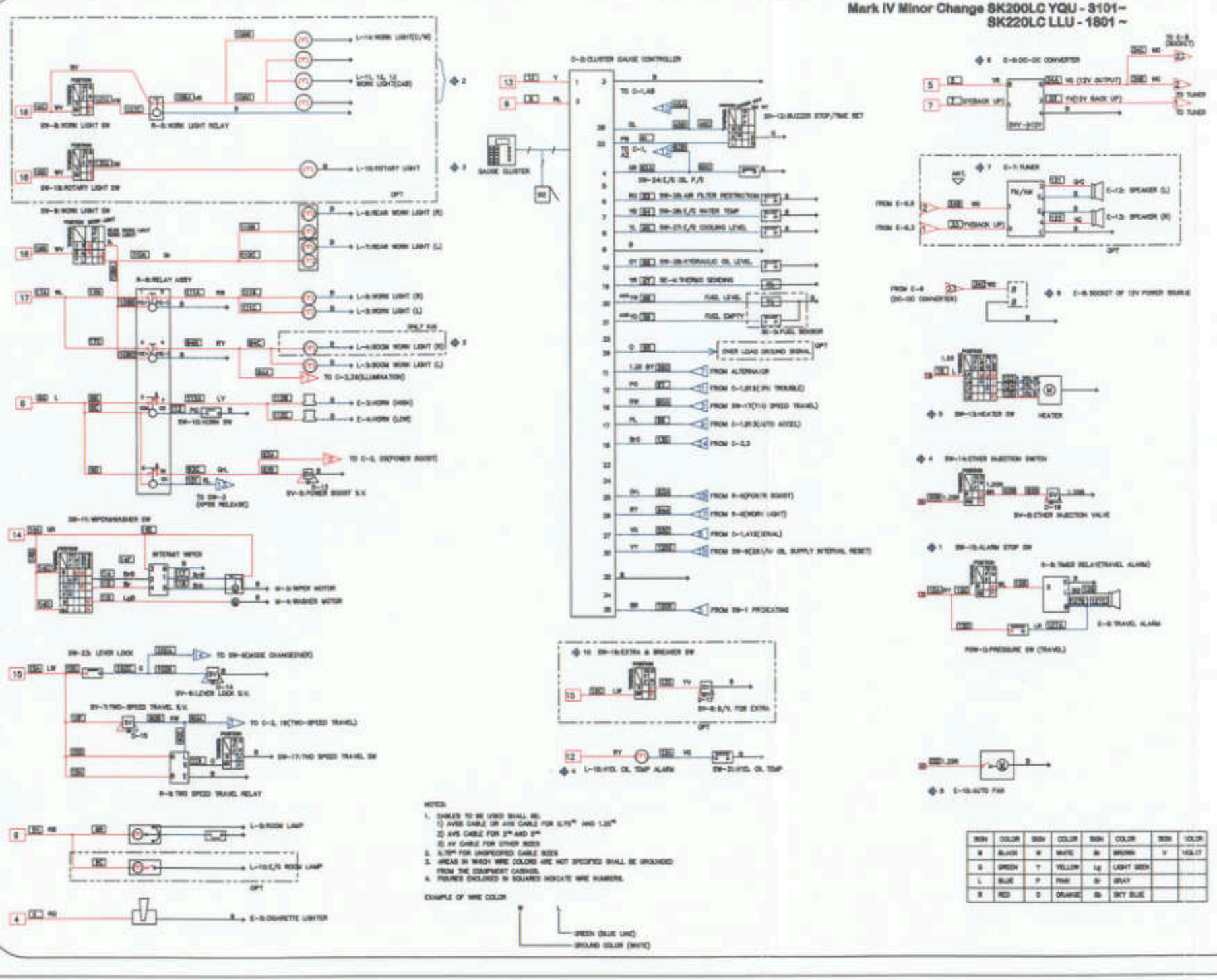
ON – Lamp illuminates when Hydraulic Oil Temperature is 3°C (26.6°F) or lower.
OFF – Lamp goes out when Hydraulic Oil Temperature reaches 10°C (40°F).
Normal operating temperature of hydraulic oil is 45°C – 55°C (113°F – 131°F).

7. 24V CIGARETTE LIGHTER



ON– Push in.
OFF– Lighter "POPS" out.
The lighter should pop out within 30 seconds. If it doesn't, have it repaired.
Do not use lighter for a 12V power source.

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NOTES:
1. CABLES TO BE USED SHALL BE:
   1) AVSS CABLE OR AVS CABLE FOR 0.75^{sq} AND 1.25^{sq}
   2) AVS CABLE FOR 2^{sq} AND 3^{sq}
   3) AV CABLE FOR OTHER SIZES
2. 0.75^{sq} FOR UNSPECIFIED CABLE SIZES
3. AREAS IN WHICH WIRE COLORS ARE NOT SPECIFIED SHALL BE GROUNDED FROM THE EQUIPMENT CASINGS.
4. FIGURES ENCLOSED IN SQUARES INDICATE WIRE NUMBERS.

EXAMPLE OF WIRE COLOR

SIGN	COLOR	SIGN	COLOR	SIGN	COLOR	SIGN	COLOR
B	BLACK	W	WHITE	Br	BROWN	V	VIOLET
G	GREEN	Y	YELLOW	Lg	LIGHT GREEN		
L	BLUE	P	PINK	Gr	GRAY		
R	RED	O	ORANGE	Sb	SKY BLUE		

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