NEW HOLLAND

CRAWLER EXCAVATOR

E80B TIER 4

REPAIR MANUAL

87480998 NA

Issued 01July 08

NEW HOLLAND CONSTRUCTION

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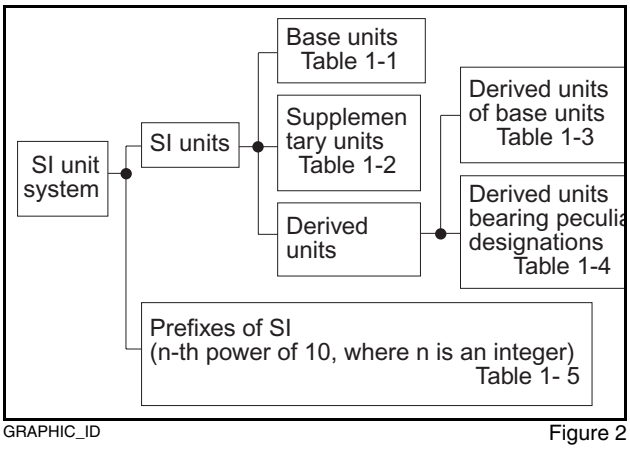
Revision History				
Issue	Issue Date	Applicable Machines	Form Number	Remarks
First Edition	07-2008	E80B	5-14960	

INTERNATIONAL UNIT SYSTEM

INTRODUCTION

Although this manual uses the SI units system. Outline of SI units system is described here.
Given below are an excerpt of the units that are related to this manual :

1. Etymology of SI Units
   English : International System of units
2. Construction of SI Unit System



GRAPHIC_ID Figure 2

1. Basic Units

Table1-1

QUANTITIES	DESIGNATION	SIGN
Length	Meter	m
Mass	Kilogram	kg
Time	Second	s
Current	Ampere	A
Thermodynamic temperature	Kelvin	K
Gram molecule	Mol	mol
Luminous intensity	Candela	cd

2. Supplementary Units

Table1-2

QUANTITIES	DESIGNATION	SIGN
Plain angle	Radian	rad
Solid angle	Steradian	sr

3. Derived Units of Basic Units

Table1-3

QUANTITIES	DESIGNATION	SIGN
Area	Square meter	m^2
Volume	Cubic meter	m^3
Velocity	Meter per second	m/s
Acceleration	Meter per second / second	m/s^2
Density	Kilogram per cubic meter	kg/m^3

4. Derived Units bearing Peculiar Designations

Table1-4

QUANTITY	UNIT	SYMBOL	FORMULA
Frequency	hertz	Hz	1Hz=1/s
Force	newton	N	$kg \cdot m/s^2$
Pressure and Stress	pascal	Pa	N/m^2
Energy, Work and Quantity of heat	joule	J	N•m
Power	watt	W	J/s
Quantity of electricity	coulomb	C	A•s
Electric potential difference, Voltage, and Electromotive force	volt	V	W/A
Quantity of static electricity and Electric capacitance	farad	F	C/V
Electric resistance	ohm	Ω	V/A
Celcius temperature	celcius degree or degree	°C	(t+273.15)K
Illuminance	lux	lx	$l\ m/m^2$

5. Prefixes of SI

PREFIX		POWER
DESIGNATION	SIGN	
Giga	G	10^9
Mega	M	10^6
Kilo	k	10^3
Hecto	h	10^2
Deca	da	10
Deci	d	10^{-1}
Centi	c	10^{-2}
Milli	m	10^{-3}
Micro	m	10^{-6}
Nano	n	10^{-9}
Pico	p	10^{-12}

Unit: kg (lbs)

Item \ Model	2.13 M (7 ft-0 in) Arm + 600 mm (23.6 in shoe)	
3.3.2 Arm cylinder	68	(150)
3.3.3 Pin (Mounting arm • Mounting arm cylinder)	13	(29)
4. Lubricant and water (including the following :)	211	(465)
4.1 Hydraulic oil	*103	(227)
4.2 Engine oil	5	(11)
4.3 Fuel	103	(227)
4.4 Water	5	(11)

NOTE: *Numerical values marked * indicate the dry weight.*

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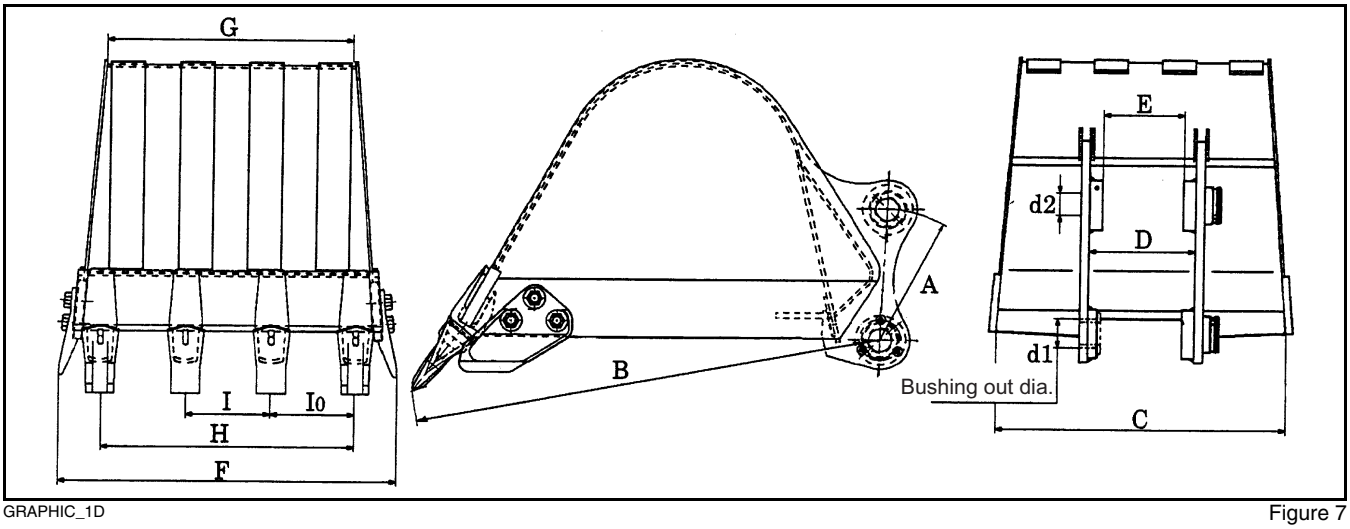
Issue	Issue Date	Applicable Machines	Form Number	Remarks
First Edition	07-2008	E80B	5-14990	

BUCKET

BUCKET DIMENSIONAL DRAWING

Hoe bucket



GRAPHIC_1D

Figure 7

BUCKET DIMENSIONAL TABLE

Unit : mm (ft-in)

Type	Hoe Bucket	
Capacity	0.22 m^3 (0.29 cu/yd)	0.28 m^3 (0.37 cu/yd)
Part No.	YT61B00019F1	YT61B00042F1
A	290 (11.4in)	290 (11.4in)
B	R1,037 (3ft-5in)	R1,037 (3ft-5in)
C	550 (21.7in)	650 (25.6in)
D	238 (9.37in)	238 (9.37in)
E	182 (7.17in)	182 (7.17in)
F	650 (25.6in)	750 (29.5in)
G	450 (17.7in)	550 (21.7in)
H	466 (18.3in)	573 (22.6in)
I	166 (6.54in)	191 (7.52in)
Io	150 (5.91in)	191 (7.52in)
d1	Ø65 (2.56in)	Ø65 (2.56in)
d2	Ø50 (1.97in)	Ø50 (1.97in)

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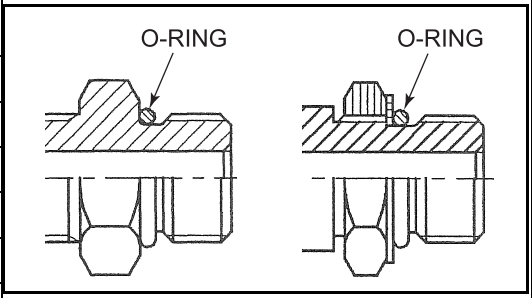
First Edition	07-2008	E80B	5-15000	

TIGHTENING TORQUE FOR HOSE AND FITTING

JOINT (O-RING TYPE)

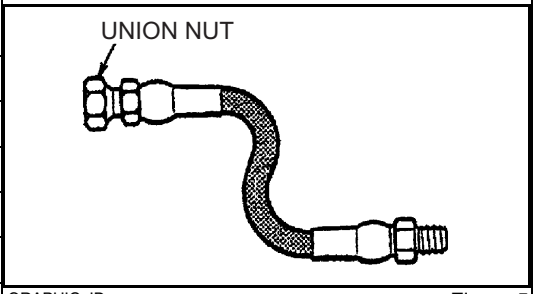
Size (PF)	Wrench (mm)	Tightening torque Nm (pound-ft)
1 / 8	14	17±2 (13±1.5)
1 / 4	19	36±2 (27±1.5)
3 / 8	22	74±5 (55±4)
1 / 2	27	108±9.8 (80.0±7)
3 / 4	36	162±9.8 (119±7)
1	41	255±9.8 (188±7)



GRAPHIC_ID Figure 4

HYDRAULIC HOSE (30° FLARE TYPE)

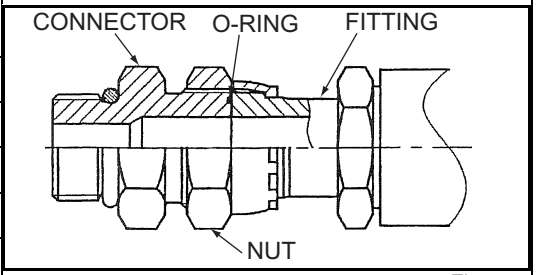
Size (PF)	Wrench(mm)	Tightening torque Nm (pound-ft)
1 / 8	17	15±2.0 (11±1.5)
1 / 4	19	29±4.9 (21±3.6)
3 / 8	22	49±4.9 (36±3.6)
1 / 2	27	78±4.9 (58±3.6)
3 / 4	36	118±9.8 (87±7.2)
1	41	137±15 (101±11)



GRAPHIC_ID Figure 5

JOINT (ORS TYPE)

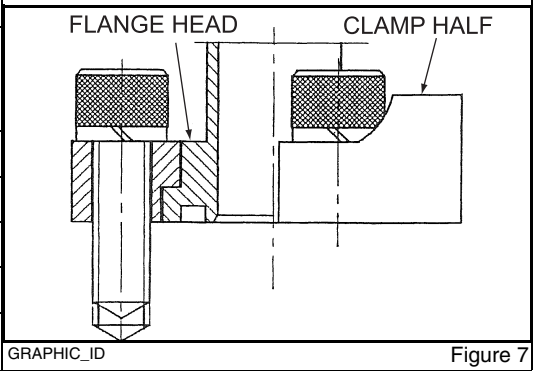
Unified screw size	Opposing flats	Tightening Torque Nm (pound-ft)
1-14 UNS	30, 32	137±14 (101±10)
1 3 / 16-12 UN	36	177±18 (131±13)
	41	206±26 (152±15)
1 7/ 16-12 UN	41	206±26 (152±15)
	46	206±26 (152±15)



GRAPHIC_ID Figure 6

SPLIT FLANGE

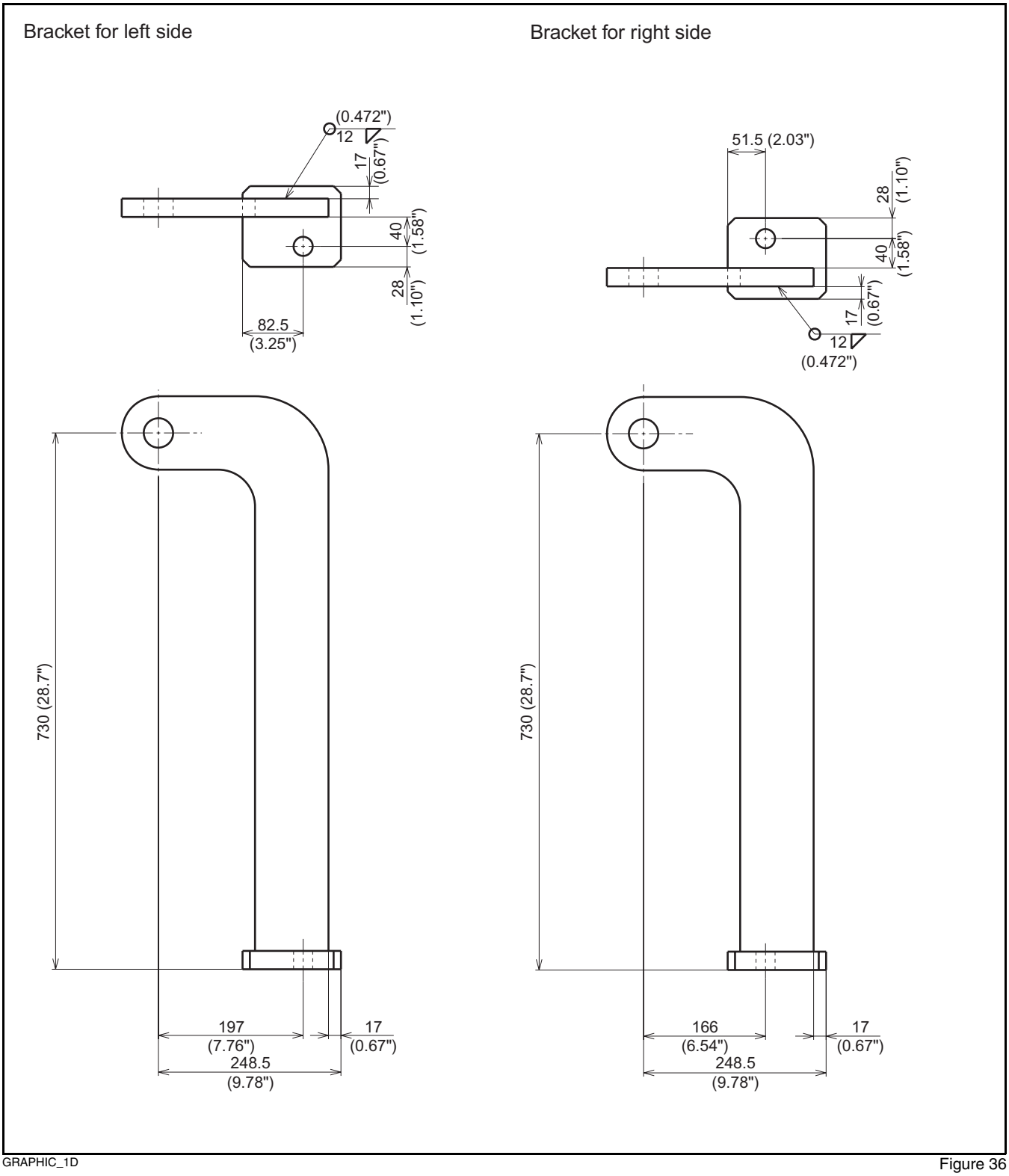
Size	Tightening torque Nm (pound-ft)			
	Standard pressure series 20.6 MPa	Bolt size	Hi pressure series 41.2 MPa	Bolt size
3 / 4	33.9±5.6 (25±4)	M10	39.5±5.6 (29±4)	M10
1	42.4±5.6 (31±4)	M10	62.2±5.6 (46±4)	M12
1 1 / 4	55.1±7.1 (41±5)	M10	93.3±8.4 (69±6)	M14
1 1 / 2	70.6±8.4 (52±6)	M12	169±11 (125±8)	M16
2	81.9±8.4 (60±6)	M12	282±11 (208±8)	M20



GRAPHIC_ID Figure 7

COUNTERWEIGHT LIFTING JIG

1. Two lifting jigs (YY60C01111P1, YY60C01112P1)



GRAPHIC_1D

Figure 36

CNH America LLC reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

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First Edition	07-2008	E80B	5-15020	

GROUP No.		LOCATION	WORK TO BE DONE	UNIT	REMARK	UNIT: HOUR
03 Swing frame	148	Engine	O/H	1 set	Reference for engine	
		Other necessary works	Detach/attach	1 set	Removing and installing guard	0.5
			Detach/attach	1 set	Removing and installing counter weight	0.4
			Detach/attach	1 set	Removing and installing pump	2.3
			Detach/attach	1 set	Removing and installing air cleaner	0.4
			Detach/attach	1 set	Removing and installing muffler	0.4
			Detach/attach	1 set	Removing and installing radiator	3.5
	150	Upper frame			See Upper Frame Removal	
	151	Upper frame ASSY	Detach/attach	1 pc.	After removing swivel joint	1.0
	152	•Mounting bolt	Detach/attach	1 set		0.3
	153	•Upper frame slinging	Detach/attach	1 pc.		0.3
	154	•Cleaning	Cleaning	1 pc.		0.2
	155	•Sealant	Apply	1 pc.		0.2
		Other necessary works	Detach/attach	1 set	Cab	1.5
			Detach/attach	1 set	Guard	0.3
			Detach/attach	1 set	Counter weight	0.4
			Detach/attach	1 set	Boom	1.0
04 Travel system	00	Travel relation			See Crawler Removal	
	01	Track link ASSY	Detach/attach	One side	Include adjustment of tension	1.0
	02	•Track link attaching and detaching position	Preparation	One side		0.1
	03	•Master pin	Detach/attach	One side		0.4
	04	•Track link extending and winding	Detach/attach	One side		0.4
	05	Shoe plate	Replace	1 pc.		0.4
	10	Upper roller relation			See Upper Roller Removal	
	11	Upper roller ASSY	Detach/attach	1	After removing track link	0.2
	12	Upper roller	O/H	1		1.0
	20	Lower roller relation			See Lower Roller Removal	
	21	Lower roller ASSY	Detach/attach	1		0.2
	22	Lower roller	O/H	1		1.0
	30	Front idler relation			See Front Idler Removal	
	31	Front idler ASSY	Detach/attach	One side	After removing track link	0.5
	32	Front idler ASSY slinging	Detach/attach	One side		0.2
	33	Front idler ASSY	Disassemble	One side		0.2
	34	Idler ASSY	O/H	One side		1.0
	35	Idler adjuster ASSY	O/H	One side	Replace spring	2.0
	36	•Grease cylinder	O/H	One side		0.5
	40	Sprocket			See Sprocket Removal	
	41	Sprocket	Replace	One side	After removing track link	0.5
	50	Travel motor relation			See Travel Motor Removal	

NOTES

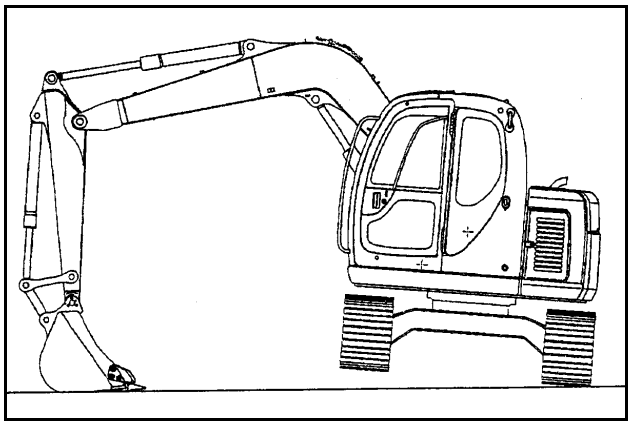
MEASURING TRAVEL PERFORMANCES

Travel Speed

1. Purposes
   Measure the travel sprocket revolution and confirm the performances between the hydraulic pump and the travel motor of the travel drive system.
2. Conditions
   Hydraulic oil temperature ;
   45~55°C (113~131°F)
   Crawler on the right and left sides are tensioned evenly.
3. Preparation
   Attach the reflection panel with a magnet to the travel motor cover.
   Swing the swing frame through 90° as shown and make the crawler on one side take off the ground, using the attachment.
4. Measurement
   Engine revolution; Hi idle
   2-speed travel switch; 1st speed and 2nd speed
   Measuring points ; Right and left
   Method, example 1 ;
   Measure revolution with a stroboscope
   Method, example 2 ;
   Measure the revolutions per minute visually.

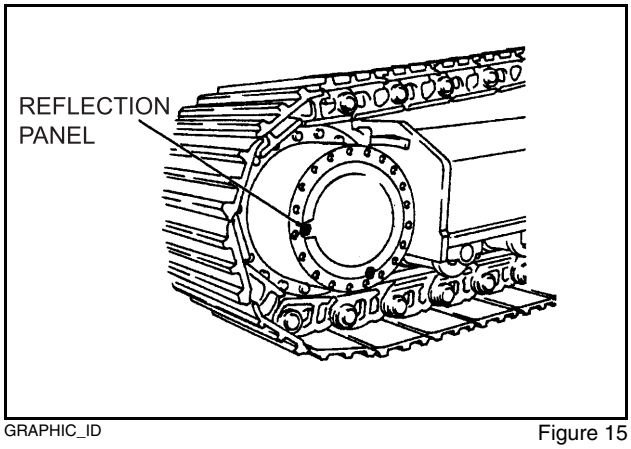
Sprocket revolution — Unit: min^{-1}

Measurement item		Standard value	Repairable level	Service limit
RH & LH	H mode 1st speed	31.1-27.9	24.3 -21.8	18.7 or less
	H mode 2nd speed	59.5-53.9	46.4 -42.0	36.1 or less
	S mode 2nd speed	59.5-53.9	46.4 -42.0	36.1 or less



GRAPHIC_ID Figure 14

ONE SIDE LIFTED POSITION

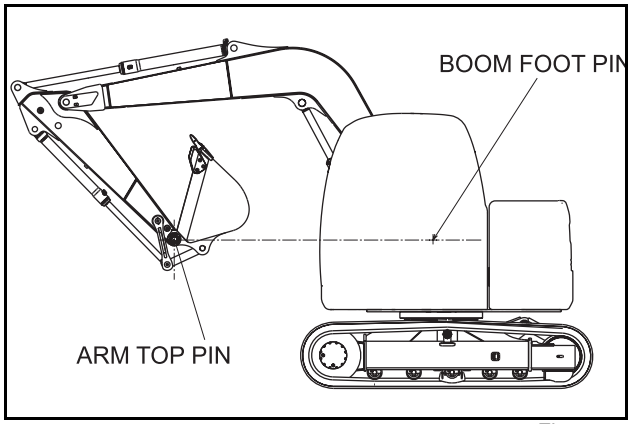


GRAPHIC_ID Figure 15

ADHERING POSITION OF REFLECTION PANEL

Deviation of Travel

1. Purpose
   Measure the amount of deviation at 20m (66ft) travel and confirm the horizontal balance between the hydraulic pump and the travel motor of the travel drive system.
2. Condition
   Hydraulic oil temperature ;
   45~55°C (113~131°F)
   RH and LH crawler are tensioned evenly.
   Firm, level ground
   Engine revolution; Hi idle



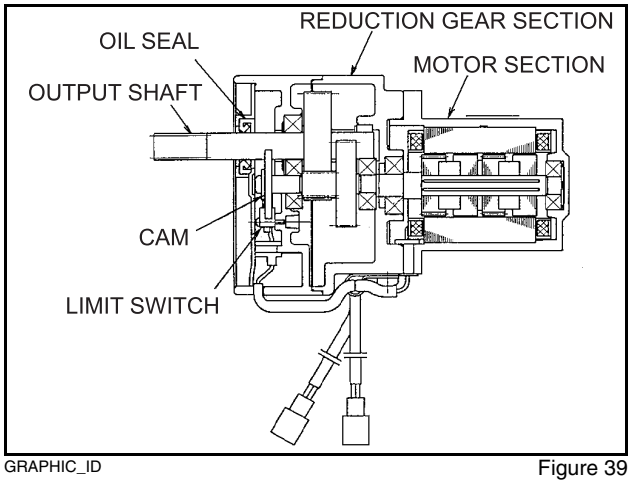
GRAPHIC_ID Figure 16

TRAVEL POSITION

ENGINE CONTROL EQUIPMENT

Governor motor and Mechatro controller

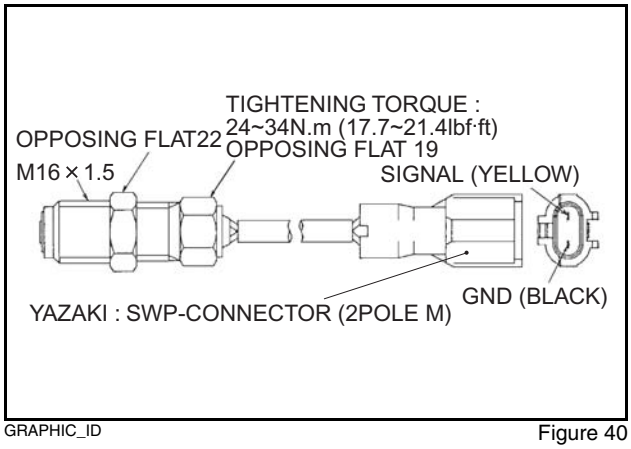
1. By operating accel dial, the input voltage change is sensed by CN102-8 pin of Mechatro controller.
2. The Mechatro controller computes the input voltage, and outputs command to governor motor, and incline governor lever of engine to the swing angle corresponding to accel dial set value..
3. The limit switch in the governor motor is the starting point of the governor motor.



GRAPHIC_ID Figure 39

Speed sensor

1. Installing place
   Engine flywheel housing
2. Sensor attaching procedure
   A. Screw the sensor in until it contacts the ring gear. In this case, do not damage the top of the sensor.
   B. Rotate the sensor one turn (360 degrees) reversely, and tighten with a lock nut (Opposing flats 22 mm).
   Tightening torque : 29.4±4.9Nm (21.7±3.6 pound-ft)
   C. Check the outqut voltage at the maximum and minimum speed in no-load running.
   D. If the above-mentioned outqut is beyond the range of table of table, loosen the nut again And adjust the between the sensor and ring gear to obtain the appropriate voltage



GRAPHIC_ID Figure 40

The Voltage From Sensor

	Output Voltage	
Engine Speed	Voltage Waveform	AC Current (Effective Value)
Maximum Speed At No-Load 2420 min^{-1}	20V- 72V (Peak - Peak)	7.1V - 25.5V
Minumum Speed At No-Load 1050 min^{-1}	9V - 40V (Peak - Peak)	3.2V - 14.2V

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No.	Displays	Contents	No.	Displays	Contents
19	NO.19 DIGITAL INPUT DI15 OFF DI16 OFF DI17 OFF DI18 OFF DI19 OFF DI20 OFF DI21 OFF DI22 OFF DI23 OFF DI24 OFF DI25 OFF DI26 OFF DI27 OFF DI28 OFF	 ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication	23	NO.23 DIGITAL OUTPUT DO15 COMP. OFF MEAS. OFF DO16 COMP. OFF MEAS. OFF DO17 COMP. OFF MEAS. OFF DO18 COMP. OFF MEAS. OFF DO19 COMP. OFF MEAS. OFF DO20 COMP. OFF MEAS. OFF DO21 COMP. OFF MEAS. OFF	 Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value
20	NO.20 DIGITAL INPUT DI29 OFF DI30 OFF DI31 OFF DI32 OFF DI33 OFF DI34 OFF DI35 OFF DI36 OFF DI37 OFF DI38 OFF DI39 OFF DI40 OFF DI41 OFF DI42 OFF	 ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication ON/OFF indication	24	NO.24 DIGITAL OUTPUT DO22 COMP. OFF MEAS. OFF DO23 COMP. OFF MEAS. OFF DO24 COMP. OFF MEAS. OFF DO25 COMP. OFF MEAS. OFF DO26 COMP. OFF MEAS. OFF DO27 COMP. OFF MEAS. OFF DO28 COMP. OFF MEAS. OFF	 Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value
21	NO.21 DIGITAL OUTPUT DO1 COMP. OFF MEAS. OFF DO2 COMP. OFF MEAS. OFF DO3 COMP. OFF MEAS. OFF DO4 COMP. OFF MEAS. OFF DO5 COMP. OFF MEAS. OFF DO6 COMP. OFF MEAS. OFF DO7 COMP. OFF MEAS. OFF	 Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value	25	NO.25 WIPER SYSTEM WIPER SW OFF RISEUP SW OFF REVERSE SW OFF PREVENT ARC OFF CW MOTOR RLY OFF CCW MOTOR RLY OFF WASHER SW OFF MOTOR RELAY OFF	 Wiper switch Wiper rise-up switch Wiper reverse rotation switch Wiper motor ark prevention relay Wiper normal rotation relay Wiper reverse rotation relay Washer switch Washer motor relay
22	NO.22 DIGITAL OUTPUT DO8 COMP. OFF MEAS. OFF DO9 COMP. OFF MEAS. OFF DO10 COMP. OFF MEAS. OFF DO11 COMP. OFF MEAS. OFF DO12 COMP. OFF MEAS. OFF DO13 COMP. OFF MEAS. OFF DO14 COMP. OFF MEAS. OFF	 Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value Set value in computer Measured value	27	NO.27 MERIT SYSTEM COMMUNICATION OFF 4 0412051200	 Status of communication in MERIT controller

GRAPHIC_1D

Figure 15

2) Service diagnosis mode No.2

No.	Displays	Contents	No.	Displays	Contents
1	NO.1 MAIN CONT. P/N YT22E00064F1 PROGRAM VERSION 1-VER 01.00 2-VER 00.00 SERVICE DIAG 2	 P/No. indication Program version indication MERIT controller program version Service diagnosis mode	33	NO.33 BUCKET C-1 P1-PRES 0.0M C-2 P2-PRES 0.0M E-1 P1-PSV 0mA E-2 P2-PSV 0mA D-1 P1-UL(BPC) 0mA D-2 P2-UL(BPC) 0mA D-3 S-TRAVEL 0mA B-5 BUCKET DIG 0.0M B-6 BUCKET DUMP 0.0M G-3 ENG SPEED 1000 POWER SHIFT 0mA	 Pump pressure sensor Pump pressure sensor Command current Command current Command current Command current Command current Bucket digging pressure sensor Bucket dump pressure sensor Engine actual rpm Power shift current

GRAPHIC_1D

Figure 16

Connector No.	Pin No.	Port name	Function	Input/putput	Signal level
CN104	1	GA	Boom head	Input	0V
	2	A17			0.5~4.5V
	3	+5VA			Power output 5V
	4	+5VA	Boom rod	Input	Power output 5V
	5	A18			0.5～4.5V
	6	GA			0V
	7	GA	Spare	Input	0V
	8	A19			0.5~4.5V
	9	+5VA			Power output 5V
	10	+5VA	Spare	Input	Power output 5V
	11	A20			0.5~4.5V
	12	GA			0V
	13	A21	Spare	Input	0.5~4.5V
	14	GA			0V
	15	A22	Fuel level	Input	0.5~4.5V
	16	GP			0V
	17	A23	Engine coolant temp.	Input	0.5~4.5V
	18	GA			0V
	19	GA	Swing left	Input	0V
	20	A24			0.5~4.5V
	21	+5VA			Power output 5V
	22	+5VA	Bucket dump	Input	Power output 5V
	23	A25			0.5~4.5V
	24	GA			0V
	25	GA	Bucket digging	Input	0V
	26	A26			0.5~4.5V
	27	+5VA			Power output 5V
	28	DI 1	Starting point of accel motor	Input	GND / OPEN

Connector No.	Pin No.	Port name	Function	Input/putput	Signal level
CN105	1	+24V	Battery relay output side		20~32V
	2	+24V	Battery relay output side (sensor analog output)		20~32V
	3	+24V	Battery relay output side		20~32V
	4	DO 7	Travel 1,2 speed select valve	Output	24V/OPEN
	5	DO 8	Swing P/B select valve	Output	24V/OPEN
	6	DO 9	Pressure compensation valve	Output	24V/OPEN
	7	DO 11	Spare	Output	24V/OPEN
	8	GND	Battery (-)		0V
	9	GND	Battery (-)		0V
	10	D10+	Spare	Output	+0~800mA
	11	D1+	Spare	Output	+0~800mA
	12	D1-			-0~800mA
	13	D2+	Spare	Output	+0~800mA
	14	D2-			-0~800mA
	15	D3+	Spare	Output	+0~800mA
	16	D3-			-0~800mA
	17	D4+	Spare	Output	+0~800mA
	18	D4-			-0~800mA
	19	D5+	Spare	Output	+0~800mA
	20	D5-			-0~800mA
	21	GND	Battery (-)		0V
	22	D10-	Spare	Output	-0~800mA
	23	D6+	Spare	Output	+0~800mA
	24	D6-			-0~800mA
	25	D7+	Spare	Output	+0~800mA
	26	D7-			-0~800mA
	27	D8+	Spare	Output	+0~800mA
	28	D8-			-0~800mA
	29	D9+	Spare	Output	-0~800mA
	30	D9-			+0~800mA
	31	+24V	Battery direct connection		20~32V

GRAPHIC_1D

Figure 30

CNH America LLC reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

All data given in this publication is subject to production variations. Dimensions and weights are only approximate. Illustrations do not necessarily show products in standard condition. For exact information about any particular product, please consult your Dealer

Revision History				
Issue	Issue Date	Applicable Machines	Form Number	Remarks
First Edition	07-2008	E80B	5-15060	

Travel Circuit

TRAVEL MOTOR FUNCTIONS

(1) Functions

1)Prevention from overrun on a slope

2)Shockless relief valve prevents sudden stop by inertia

3)High/Low 2 speed switching mechanism

4)Travel parking brake

5)Travel speed automatic switching mechanism

TRAVEL FORWARD PILOT SIMULTANEOUS OPERATION CIRCUIT

(1)Operation

1)Start travel right and left at the same time with control lever, and the pilot proportional secondary pressure is delivered through P/V (11) 2, 4 ports, at the same time select higher pressure and the higher pressure is delivered through 5, 6 ports, then acts on low pressure sensors (SE9) (SE10).

2)Pilot proportional secondary pressure flows into a2, a3 ports of control valve (2), acts on travel spool, and switches main circuit.

3)The signal output by low pressure sensor is input to mechatro controller, and the output voltage of low pressure sensor is input to mechatro controller, and the engine speed is changed from 2200 rpm to 2400 rpm.

TRAVEL 2 SPEED SOLENOID COMMAND CIRCUIT

(1)Purpose

Change travel motor speed with switch.

(2)Operation

Press switches with rabbit and turtle marks on travel lever grips, and the solenoid (SV-3) of proportional valve block (13) is excited and is switched, and solenoid command is output by port A2 and sends to P port of travel motor (4), opens oil passage to high speed piston, the self-pressure is led to the swash plate and the swash plate is changed to high speed tilting angle (small tilting).

TRAVEL MAIN CIRCUIT (RIGHT OPERATION)

(1)Operation

With travel pilot operation, the travel speed is switched, and the oil delivered through D1 port of main pump passes through C/V P-A2, flows into P2 port of travel motor (4) through C port of swivel joint (9) allowing travel motor to perform the operation.
(Refer Components System: Travel Motor Function)

TRAVEL MAIN CIRCUIT (RIGHT AND LEFT SIMULTANEOUS OPERATION)

(1)Purpose

1. Control of travel deviation caused by different pressure loading

(2)Operation

As for the oil flow at simultaneous operation, the following explanation is based on the assumption, that the loaded pressure of right travel is higher than left. Before the oil flows through the right and left travel spools, and the oil flows into the travel motor (4) via A2, A3 ports, the oil from P port flows via the pressure compensation valve (A). In this case, the right higher loading pressure acts on the pressure compensation valve (A), and the pressure narrows the opening of compensation valve. Consequently, the travel deviation is controlled, because the left loading pressure increased, and the inflow rate is adjusted.

Arm Circuit

ARM CONTROL PILOT CIRCUIT

(1)Operation

1)Start arm in operation, and pilot proportional secondary pressure is output through port (4) of left pilot valve (10), and acts on low pressure sensor (SE7), and at the same time the pressure branches into 2 circuits and acts on Pi2 and b7 ports of C/V (2).

2)Then, the secondary pressure acted on C/V (2) b7 port switches arm spool. And secondary pressure acted on Pi2 port of C/V (2) releases the arm lock valve.

RECIRCULATION FOR ARM-IN OPERATION AND MAIN CIRCUIT

(1)Purpose

Speed up of arm-in operation

(2)Principle

To have a part of return oil in arm-in operation confluxes with feed oil

(3)Operation

1)Pump delivery oil flows into arm spool through P port of C/V (2). After passing through arm spool, flows through arm pressure compensation valve (G-1) and is fed to the rod side of arm cylinder (6) through B7 port of C/V (2). Simultaneously, the loading pressure for arm-in operation acts on flow control valve (G-3) provided in C/V (2) as the load sensing pressure. (See Components System: Control Valve.)
The flow is regulated in the pump delivery flow rate in accordance with the negative control pressure by keeping the differential pressure of pump delivery pressure and load sensing pressure constant.

2)On the other hand, the return oil from the head side of arm cylinder (6) flows through A7 port of C/V (2) and is led to arm spool through arm lock valve released by pilot proportional secondary pressure which acts on Pi2 port.

3)The return oil is branched into the 2 oil flows. One returns to the tank while being restricted by passing through orifice passage provided on arm spool. Another is recirculated in arm cylinder feed pressure by boost check valve (G-2) for recirculation.

SECTION 3 - SYSTEMS
CHAPTER 2 - HYDRAULIC SYSTEM

NOTES

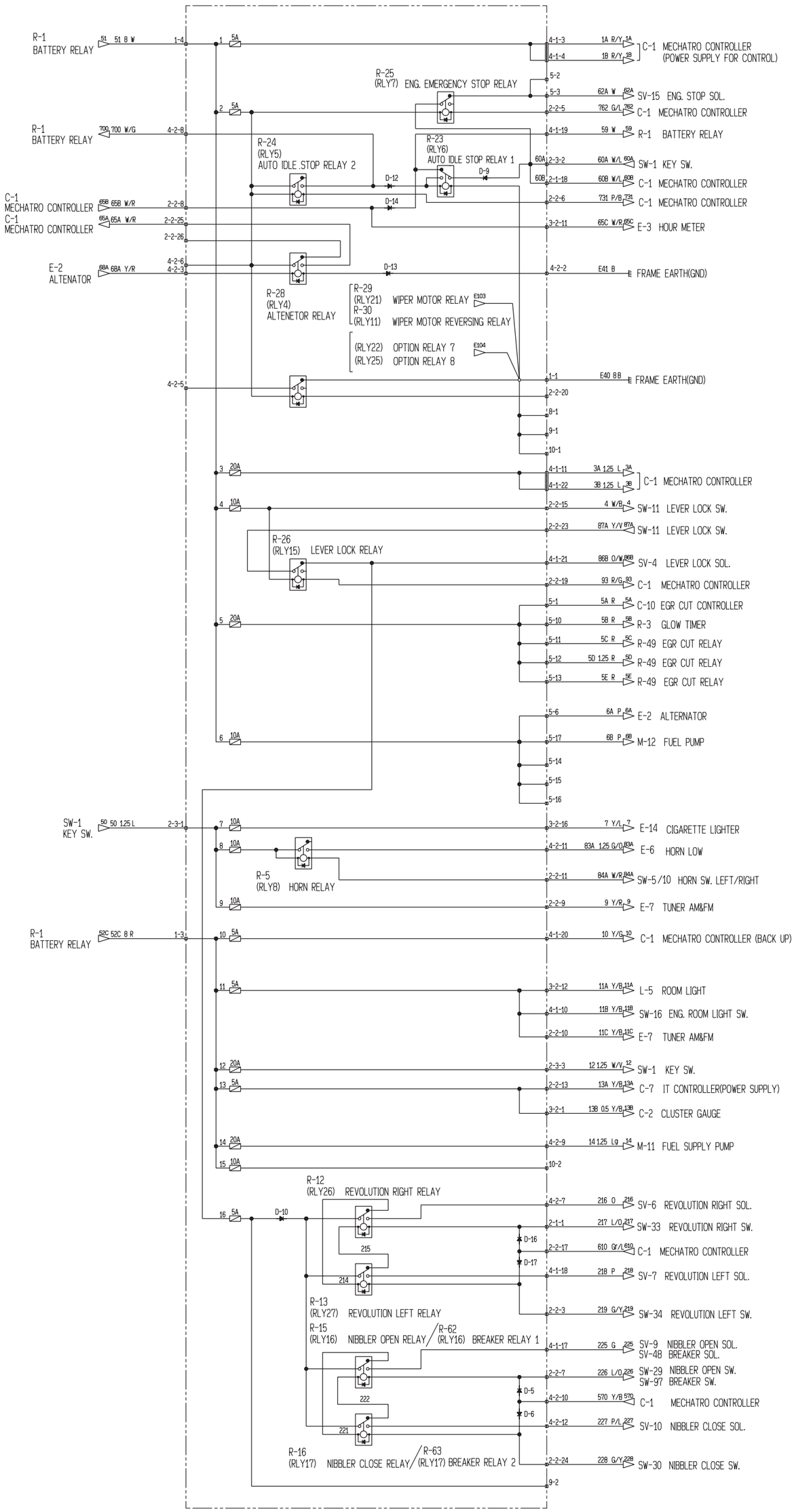


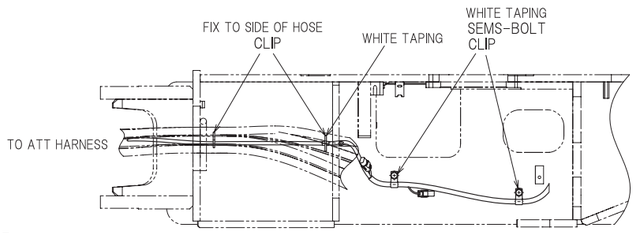
Figure 6

SECTION 3 - SYSTEMS
CHAPTER 3 - ELECTRIC SYSTEM

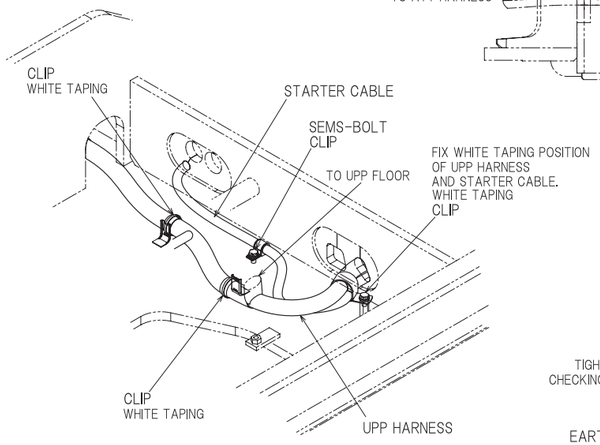
SECTION 3 - SYSTEMS
CHAPTER 3 - ELECTRIC SYSTEM

UPPER HARNESS ASSEMBLY (1/6)

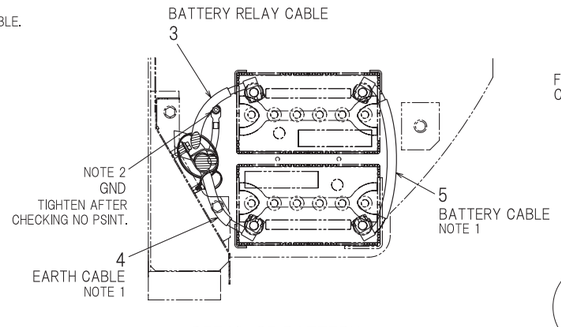
UPPER HARNESS ASSY		LF13E00008F2	(01)	
ITEM	PART NAME	PART No.	Q'TY	REMARKS
2	CABLE	YT13E01145P2	1	STARTER
3	CABLE	YT13E01142P1	1	BATTERY-RELAY
4	CABLE	YT13E01143P1	1	BATTERY-GROUND
5	CABLE	YT13E01144P2	1	BATTERY-BATTERY
6	CABLE	LE13E01006P1	1	FLOOR GROUND
45	HARNESS	LF13E01043P1	1	UPPER HARNESS



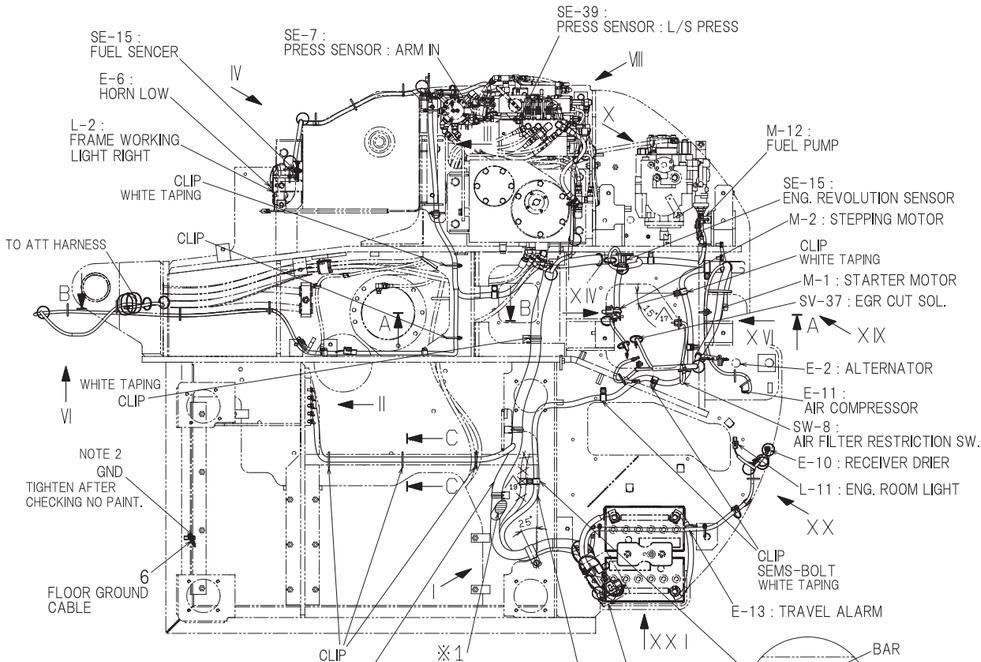
SECTION BB

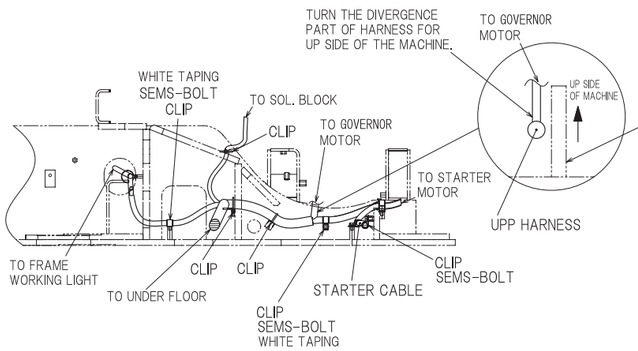


VIEW I

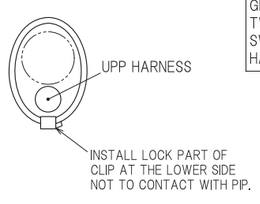


DETAIL OF BATTERY

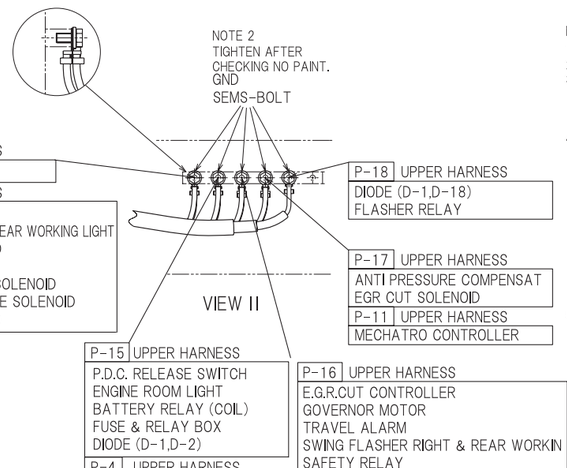




SECTION AA

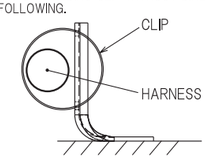


SECTION DD (3PLACES)

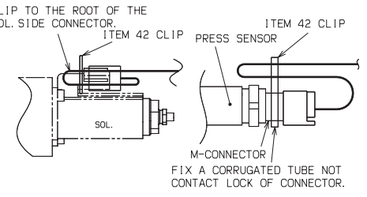


VIEW II

NOTES
1. TIGHTENING TORQUE OF BATTERY TERMINAL : 3.4N·m (2.5lbf·ft)
2. TIGHTENING TORQUE AT EARTH : 10.7N·m (7.9lbf·ft)
3. TIGHTENING TORQUE
   M6 : 9.6N·m (7.1lbf·ft)
   M8 : 23.5N·m (17.3lbf·ft)
   M10 : 46.1N·m (34.0lbf·ft)
4. ATTACHMENT OF WELDING CLIP WITHOUT DIRECTIONS IS MADE INTO THE FOLLOWING.



5. ATTACHMENT OF ITEM 42 CLIP IS MADE INTO THE FOLLOWING.



GRAPHIC_1D

Figure 16

SECTION 3 - SYSTEMS
CHAPTER 3 - ELECTRIC SYSTEM

Upper Harness (4/4) : LF13E01043P1

CONNECTORS SELECTION TABLE

CONNECTOR NAME (PIN NUM.)	MANUFUC.	PART. NUMBER	
		HOUSING	TERMINAL
2FA-JMⅡ+	AMP	174352-2	171662-1
2MA-JMⅡ+	AMP	174354-2	
3FA-JMⅡ+	AMP	174357-2	171662-1 171662-5
3MA-JMⅡ+	AMP	174359-2	
6FA-JMⅡ+	AMP	174262-2	171662-1
6MA-JMⅡ+	AMP	174264-2	
10FA-JMⅡ+	AMP	174655-2	171662-1
10MA-JMⅡ+	AMP	174657-2	
12FA-JMⅡ+	AMP	174661-2	171662-1 171662-5
12MA-JMⅡ+	AMP	174663-2	
4FA-JMⅡ+	AMP	174257-2	171662-1
4MA-JMⅡ+	AMP	174259-2	
1FA-CNA	AMP	172128-1	170032-2
1MA-CNA	AMP	172127-1	170340-1
CA104	AMP YAZAKI	170887-1 7120-8012	170002-5
CB104	AMP YAZAKI	170889-1 7120-1010	170003-5
1FA-HSG	AMP	1-480416-0	170213-2
1FA-POL	AMP	172320-2	170456-1
3FA-MQS	AMP	2-967642-1	965906-5
4FA-MCP	AMP	936622-2	1-967588-1
18MA-070MLI	AMP	174935-1	173645-3
16FA-040ⅡPM	AMP	316013-6	175266-2
28FA-040ⅡPM	AMP	316019-6	175266-2
31FA-040ⅡHD	AMP	353031-1	316837-2(0.75sq) 175267-2(1.25sq)
24FA-040ⅡHD	AMP	353029-1	316837-2(0.75sq) 175267-2(1.25sq)
17FA-040ⅡHD	AMP	353027-1	316837-2(0.75sq) 175267-2(1.25sq)
12FA-070MLI	AMP	173851-1	173631-1
14FA-070MLI	AMP	173852-1	173631-1
12FA-070MLⅡ	AMP	176116-6	173631-1
22FA-HB	AMP	917989-6	175265-1 (040Ⅱ) 175269-1 (070Ⅱ)
12FA-HB	AMP	917978-6	175269-1 (070Ⅱ)
1FY-301	YAZAKI	7123-3010	7116-3060
1MY-58Y	YAZAKI	7222-4210-30	7114-3250
2MY-58Y	YAZAKI	7222-4220-30	7114-3250
2FS-090(銀)	SUMITOMO	6189-0094	1500-0110
2FY-SWP	YAZAKI	7123-1424-40	7116-1471-08 7166-1472
2FS-DL305	SUMITOMO	6195-0060	8100-0797
6FS-DL090	SUMITOMO	6195-0021	8100-1429
2FS-SMF	SUMITOMO	6353-0122	8100-1233
13FY-PA	YAZAKI	7319-3130	7116-1050
5FY-CNB	YAZAKI	7123-2657-30	7116-2642
1FY-305	YAZAKI	7123-3012	7116-3060
1MY-305	YAZAKI	7122-3010	7114-3030
20FA-070MLⅡ	AMP	176119-6	173631-1
3FA-CNA	AMP	172132-1	170032-2
4FY-D090A	YAZAKI	7123-7144	7166-1181
2FA-CNA	AMP	172130-1	170032-2

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO
1A	RY	AVSS0.75sq	CN4-1		CN-105F
1B	RY	AVSS0.75sq	CN4-1		CN-105F
3A	L	AVSS1.25sq	CN4-1		CN-105F
3B	L	AVSS1.25sq	CN4-1		CN-106F
5A	R	AVSS0.75sq	CN-5RF		CN-209F
5B	R	AVSS0.75sq	CN-5RF		CN-215F
5C	R	AVSS0.75sq	CN-208F	DOUBLE SPLICE	CN-5RF
5D	R	AVSS1.25sq	CN-208F		CN-5RF
5E	R	AVSS0.75sq	CN-208F	DOUBLE SPLICE	CN-5RF
5F	R	AVSS0.75sq	CN-208F		CN-261F
6A	P	AEX0.75sq	CN-355F		CN-5RF
6B	P	AEX0.75sq	F-15		CN-5RF
10	YG	AVSS0.75sq	CN4-1		CN-105F
11	YB	AVSS0.75sq	CN-262F		CN4-1
14	Lg	AVSS1.25sq	CN-149F		CN4-2
29	Gr	AVSS1.25sq	CN4-1		CN-74F
34	R	AEX5sq	P-5		CN-214F
35	W	AV15sq	P-7		P-25
36A	W	AVS5sq	CN-214F		P-27
36B	W	AEX5sq	P-8		P-26
51	W	AV8sq	CN1		CN-257M
52A	R	AV8sq	CN-258M		
52B	R	AVS5sq	CN-361M		
52C	R	AV8sq	CN1		
53	Y	AV8sq	CN1		CN-257M
59	W	AVSS0.75sq	CN4-1		CN-256F
62A	W	AVSS0.75sq	CN-5RF		CN-269F
62B	W	AVSS0.75sq	CN-265F		CN-269F
62C	W	AEX0.75sq	CN-303F		CN-269F
63A	WY	AVSS0.75sq	CN-354F	DOUBLE SPLICE	CN-158F
63B	WY	AVSS0.75sq	CN-354F		CN-215F
64A	L	AVS2sq	CN-207F		
64B	L	AVSS0.75sq	CN-265F		
64C	L	AEX2sq	CN-303F		
66A	W	AEX5sq	CN-212F		
66B	W	AVSS2sq	CN-207F		
66C	W	AVS5sq	CN-362F		
68A	YR	AVSS0.75sq	CN4-2		CN-267F
68B	YR	AVSS0.75sq	CN-354F		CN-267F
68C	YR	AEX1.25sq	CN-355F		CN-267F
83	GO	AVSS1.25sq	CN-155F		CN4-2
85A	WB	AVSS1.25sq	F-11	DOUBLE SPLICE	CN4-2
85B	WB	AVSS1.25sq	F-11		CN-110F
86	OW	AVSS0.75sq	CN4-1		CN-116F
88	P	AVSS0.75sq	CN-138F		CN4-1
120	BR	AVSS0.75sq	CN-160F		CN-149F
121	BL	AVSS0.75sq	CN-160F		CN-149F
150	BP	AVSS0.75sq	CN4-1		CN-133F
155	BR	AEX0.75sq	F-1		CN-133F

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO
216	O	AVSS0.75sq	CN4-2		CN-35F
218	P	AVSS0.75sq	CN4-1		CN-35F
225	G	AVSS0.75sq	CN4-1		CN-35F
227	PL	AVSS0.75sq	CN4-2		CN-35F
402	YG	AVSS0.75sq	CN-145F		CN-74F
403	Br	AEX0.75sq	CN-157F		CN-74F
410A	Y	AVSS2sq	CN-208F	DOUBLE SPLICE	CN-141F
410B	Y	AVSS0.75sq	CN-208F		CN-261F
411A	VG	AVSS0.75sq	CN-208F	DOUBLE SPLICE	CN-209F
411B	VG	AVSS0.75sq	CN-208F		CN-261F
412	G	AEX0.75sq	CN-209F		CN-801F
413	L	AEX0.75sq	CN-209F		CN-801F
414	O	AEX0.75sq	CN-209F		CN-801F
500	O	AVSS0.75sq	CN-313F		CN-104F
501	LgW	AVSS0.75sq	CN-315F		CN-104F
502	LgY	AVSS0.75sq	CN-124F		CN-75M
503	LO	AVSS0.75sq	CN-128F		CN-75M
504	PG	AVSS0.75sq	CN-130F		CN-75M
505	PL	AVSS0.75sq	CN-131F		CN-75M
506	GrL	AVSS0.75sq	CN-103F		CN-126F
510	LgY	AVSS0.75sq	CN-704F		CN-104F
514	GrB	AVSS0.75sq	CN-312F		CN-103F
528	VG	AVSS0.75sq	CN-104F		CN-127F
539	LR	AVSS0.75sq	CN-314F		CN-103F
545	Lg	AVSS0.75sq	CN-63F		CN-158F
548	GY	AEX0.75sq	CN-107F		P-1
549	Lg	AEX0.75sq	F-12		CN-107F
560	V	AEX0.75sq	CN-358F		CN-104F
569	LR	AVSS0.75sq	CN-300F		CN-107F
570	YB	AVSS0.75sq	CN4-2		CN-572M
571	YB	AVSS0.75sq	CN-571F		CN-107F
580	B	PEXBS0.5fsq 2芯シールド	CN-136F		CN-106F
581	W		CN-136F		CN-106F
SH1	Gr		UNCONNECTED		CN-106F
582	LY	AEX0.75sq	CN-209F		F-16
584	P	AEX0.75sq	CN-209F		M-16
596	GB	AEX0.75sq	CN-107F		P-28
600	YR	AEX0.75sq	CN-104F		F-14
601	BrR	AVSS0.75sq	CN-104F		CN-152F
700	WG	AVSS0.75sq	CN4-2		CN-256F
701	V	AVSS0.75sq	CN-63F		CN-105F
702	LgB	AVSS0.75sq	CN-122F		CN-105F
715	GW	AVSS0.75sq	CN-158F		CN-74F
716	WV	AVSS0.75sq	CN-158F		CN-74F
720	PB	AVSS0.75sq	CN-123F		CN-63F
744	BP	AVSS0.75sq	CN-35F		CN-105F
745	PW	AVSS0.75sq	CN-35F		CN-105F

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO
752	Br	AEX0.75sq	CN-164F		CN-105F
763	G	AVSS0.75sq	CN-35F		CN-105F
764	YB	AVSS0.75sq	CN-35F		CN-105F
776A	BY	AVSS0.75sq	CN-209F		CN-267F
776B	BY	AVSS0.75sq	CN-215F		CN-267F
776C	BY	AEX0.75sq	T-2		CN-267F
851	G	PEXBS0.5fsq 4CORE SHIELDED CABLE	CN-359F		CN-106F
852	B		CN-359F		CN-106F
853	R		CN-359F		CN-106F
854	W		CN-359F		CN-106F
SH2	Gr		UNCONNECTED		CN-106F
900	RB	AVSS0.75sq	CN-313F		CN-104F
901	Gr	AVSS0.75sq	CN-315F		CN-104F
902	W	AVSS0.75sq	CN-124F		CN-75M
903	OB	AVSS0.75sq	CN-128F		CN-75M
904	OL	AVSS0.75sq	CN-130F		CN-75M
905	OW	AVSS0.75sq	CN-131F		CN-75M
906	YW	AVSS0.75sq	CN-103F		CN-126F
910	RL	AVSS0.75sq	CN-704F		CN-104F
914	RL	AVSS0.75sq	CN-312F		CN-103F
928	YG	AVSS0.75sq	CN-104F		CN-127F
939	WY	AVSS0.75sq	CN-314F		CN-103F
950	P	AVSS0.75sq	CN-313F		CN-104F
951	GY	AVSS0.75sq	CN-315F		CN-104F
952	BR	AVSS0.75sq	CN-124F		CN-75M
953	BrW	AVSS0.75sq	CN-128F		CN-75M
954	BrL	AVSS0.75sq	CN-130F		CN-75M
955	Gr	AVSS0.75sq	CN-131F		CN-75M
956	BrR	AVSS0.75sq	CN-103F		CN-126F
960	BP	AVSS0.75sq	CN-704F		CN-104F
964	BL	AVSS0.75sq	CN-312F		CN-103F
978	Br	AVSS0.75sq	CN-104F		CN-127F
989	YV	AVSS0.75sq	CN-314F		CN-103F
991	GY	AVSS0.75sq	CN-152F		CN-104F
E1	B	AVSS1.25sq	P-4	DOUBLE SPLICE	CN-149F
E2	B	AVS5sq	P-4		CN-150F
E7	B	AVSS1.25sq	CN-156F		P-29
E32	B	AVSS0.75sq	CN-254F		CN-265F
E21	B	AVSS0.75sq	CN-254F		CN-145F
E5	B	AVSS0.75sq	CN-254F		M-11
E3	B	AVSS1.25sq	CN-254F		CN-35F
E54	B	AVSS1.25sq	CN-254F		
E18	B	AVSS1.25sq	CN-254F	DOUBLE SPLICE	P-2
E6	B	AVSS1.25sq	CN-254F		P-2
E54	B	AVSS1.25sq	CN-254F		
E9	B	AVSS0.75sq	CN-254F		CN-116F
E23	B	AVSS0.75sq	CN-254F		CN-215F
E11	B	AVSS0.75sq	CN-254F		CN-122F
E12	B	AVSS0.75sq	CN-254F		CN-123F

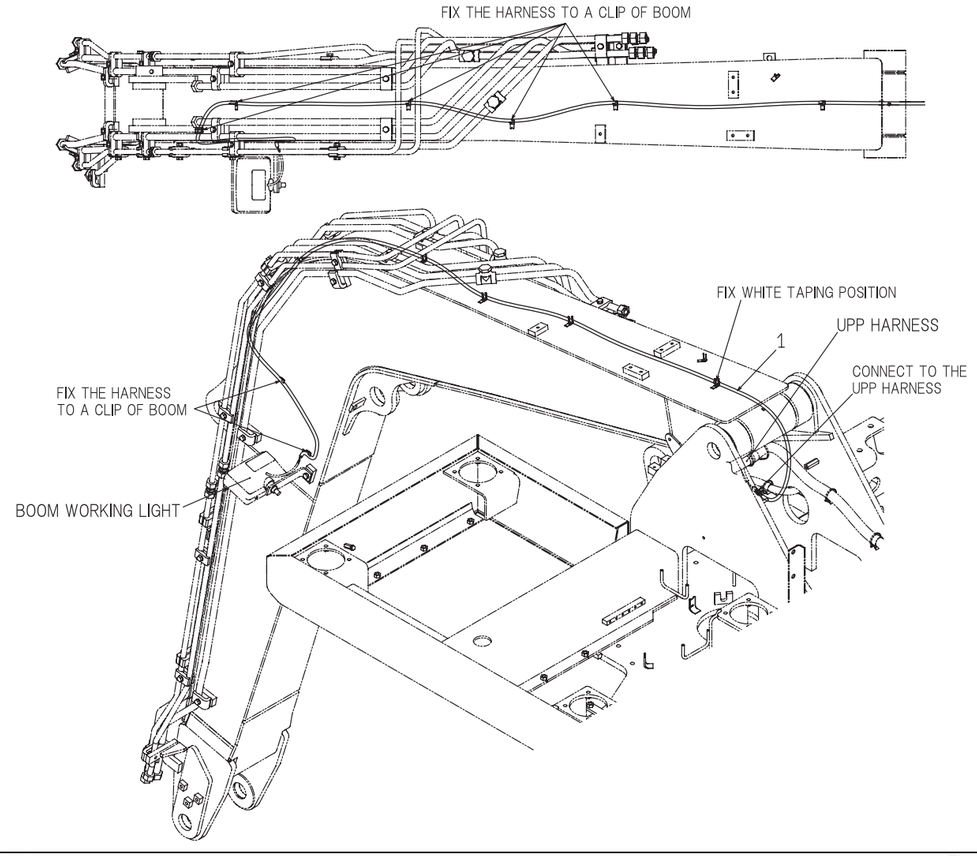
WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO
E13	B	AEX0.75sq	CN-255F		M-12
E43	B	AVSS0.75sq	CN-255F		CN-262F
E53	B	AVSS1.25sq	CN-255F		
E45	B	AVSS1.25sq	CN-255F	DOUBLE SPLICE	P-15
E46	B	AVSS1.25sq	CN-255F		P-15
E53	B	AVSS1.25sq	CN-255F		
E34	B	AVSS0.75sq	CN-255F		CN-256F
E41	B	AVSS0.75sq	CN-255F		CN4-2
E33	B	AVSS0.75sq	CN-255F		CN-265F
E40	B	AV8sq	P-9		CN1
E10	B	AVSS0.75sq	CN-252F		CN-209F
E52	B	AVSS1.25sq	CN-252F		
E50	B	AVSS1.25sq	CN-252F	DOUBLE SPLICE	P-16
E51	B	AVSS1.25sq	CN-252F		P-16
E52	B	AVSS1.25sq	CN-252F		
E27	B	AEX0.75sq	CN-252F		CN-358F
E14	B	AVSS0.75sq	CN-252F		CN-138F
E19	B	AEX0.75sq	CN-252F		CN-157F
E4	B	AVSS0.75sq	CN-252F		CN-354F
E63	B	AEX0.75sq	CN-164F	DOUBLE SPLICE	P-17
E22	B	AVSS2sq	CN-141F		P-17
E24	B	AEX2sq	CN-303F	DOUBLE SPLICE	P-30
E26	B	AEX5sq	P-19		P-30
E29	B	AVSS1.25sq	CN-105F	DOUBLE SPLICE	P-11
E30	B	AVSS1.25sq	CN-105F		P-11
E38	B	AVSS1.25sq	CN-106F	DOUBLE SPLICE	P-10
E39	B	AVSS1.25sq	CN-105F		P-10
E31	B	AVSS0.75sq	CN-261F	DOUBLE SPLICE	P-18
E42	B	AVSS0.75sq	CN-74F		P-18

GRAPHIC_1D

Figure 30

Boom Harness Assembly

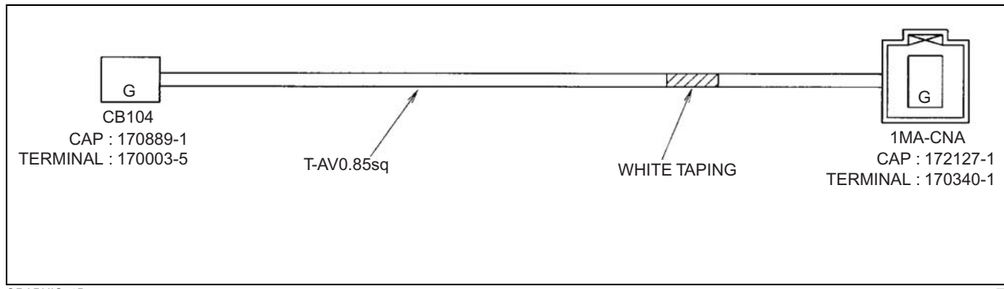
BOOM HARNESS ASSY		YT15E00003F1	(02)	
ITEM	PART NAME	PART No.	Q'TY	REMARKS
1	HARNESS	YT15E01004P2	1	BOOM HARNESS



GRAPHIC_1D

Figure 42

Boom Harness : YT15E01004P2

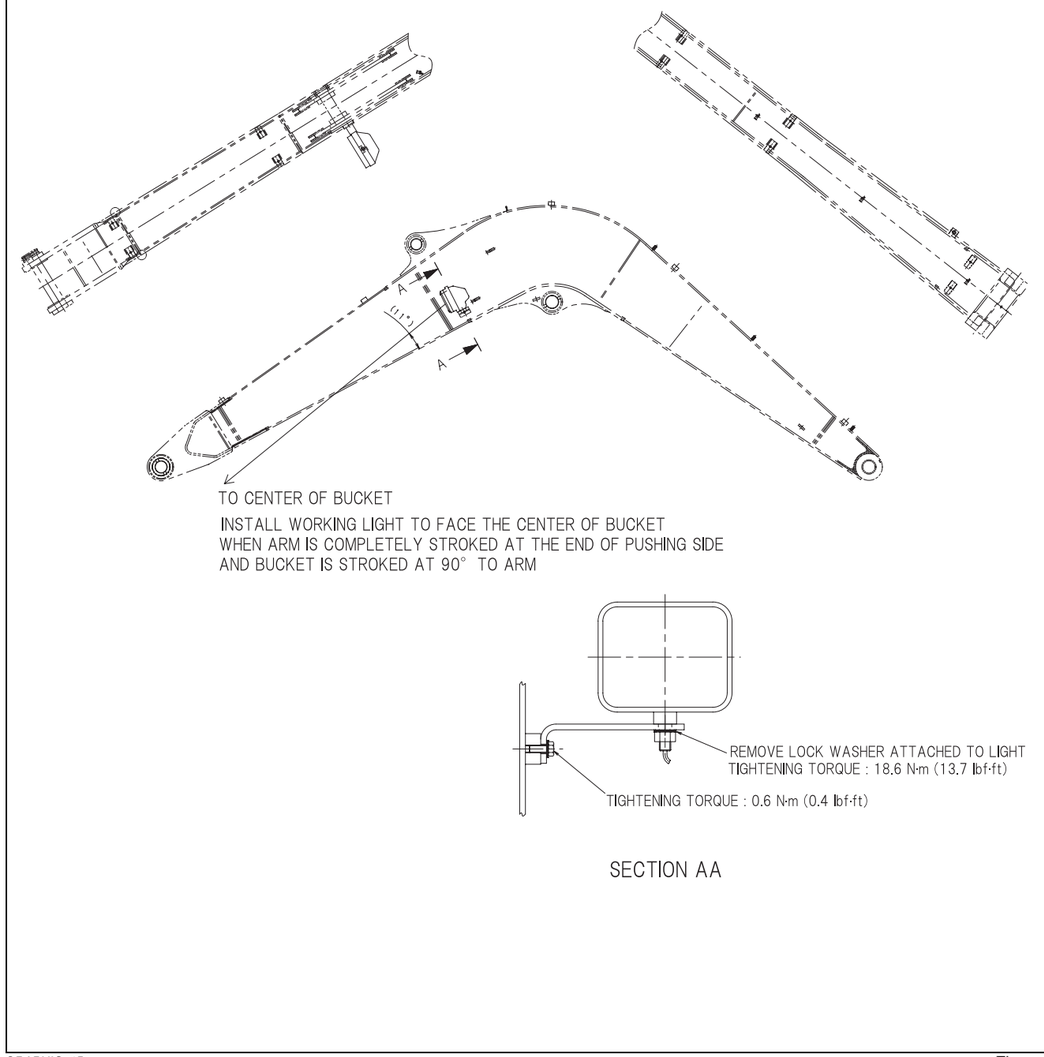


GRAPHIC_1D

Figure 43

Boom Light Install

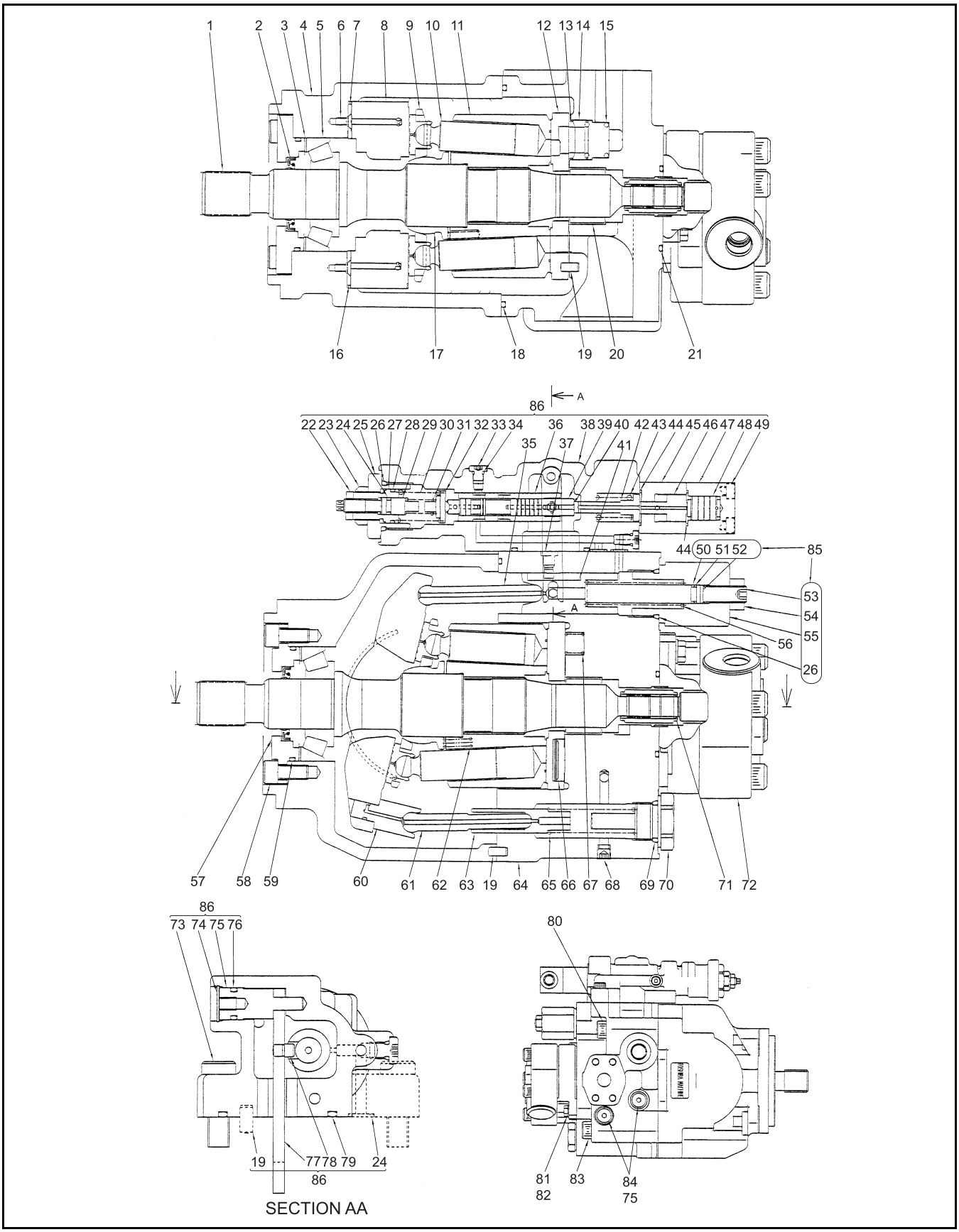
BOOM LIGHT INSTALL		LE80E00002F1	(04)	
ITEM	PART NAME	PART No.	Q'TY	REMARKS
1	LIGHT	YN80S00012F1	1	



GRAPHIC_1D

Figure 44

Construction



GRAPHIC_1D

Figure 2

CONSTRUCTION OF HYDRAULIC PUMP & REGULATOR

Adjustment Of Piston Pump

(The names for each part are depending on Fig. 15)
Using adjusting screw, the maximum flow rate and power control characteristic of pump (1st turning point P1 and 2nd turning point) are adjustable.

1. Maximum flow rate adjusting

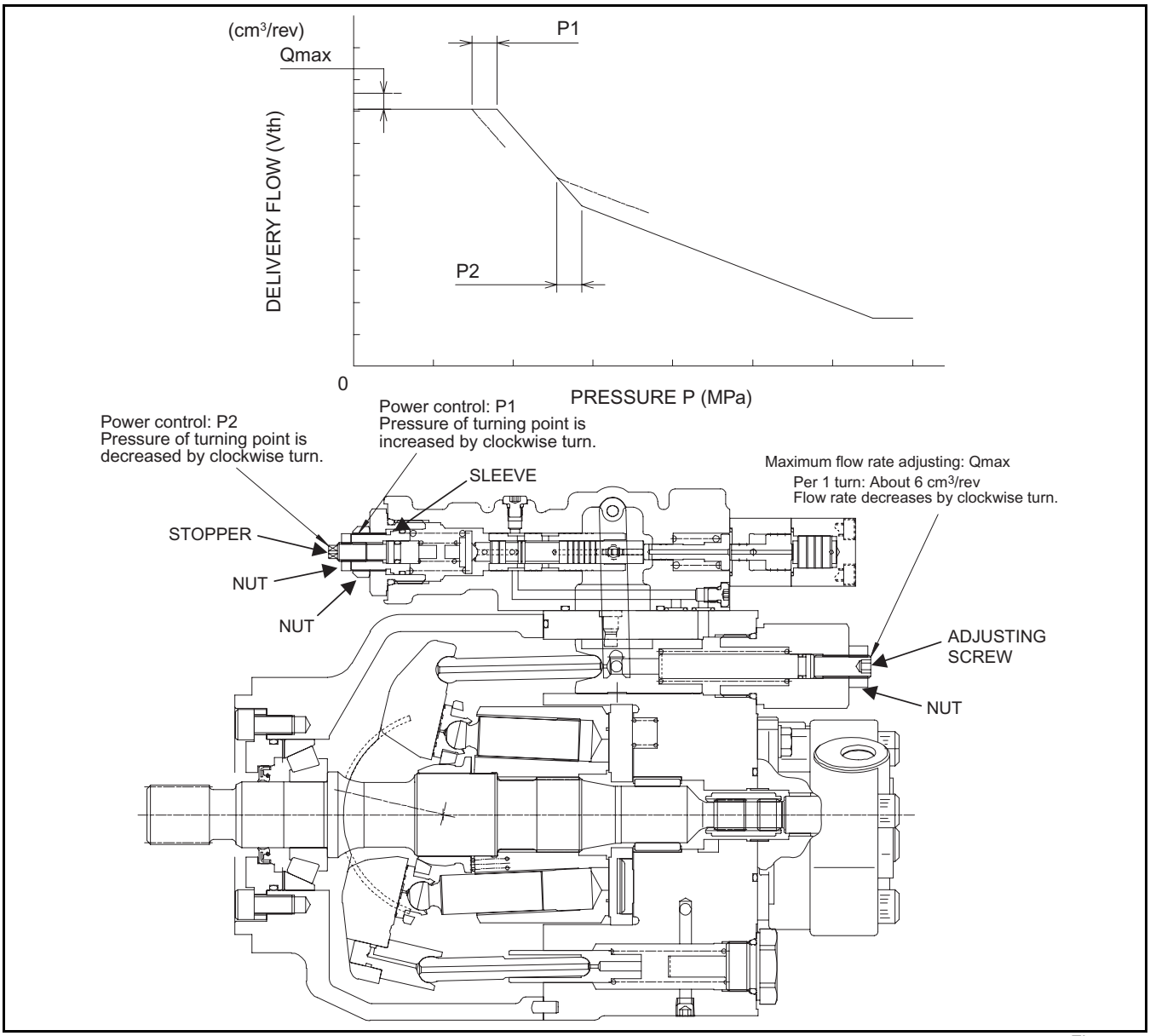
   Loosen hexagon nut and turn the lock screw to adjust the flow rate.

   Theoretical flow rate changes about 6 cm^3/rev per 1 turn of the lock screw.

2. Input power adjusting

   a)1st turning point adjusting
   Loosen the nut with the hexagon nut locked, and turn the hexagon nut to turn the sleeve together, consequently pressure is adjustable. The pressure at 1st turning point is increased by turning the sleeve clockwise. In this time, the stopper turns together, turn the stopper reversely to return to the original position.

   b)2nd turning point adjusting
   Loosen the hexagon nut with the nut locked, and turn the stopper to adjust the pressure. The pressure at 2nd turning point is decreased by turning the stopper clockwise.

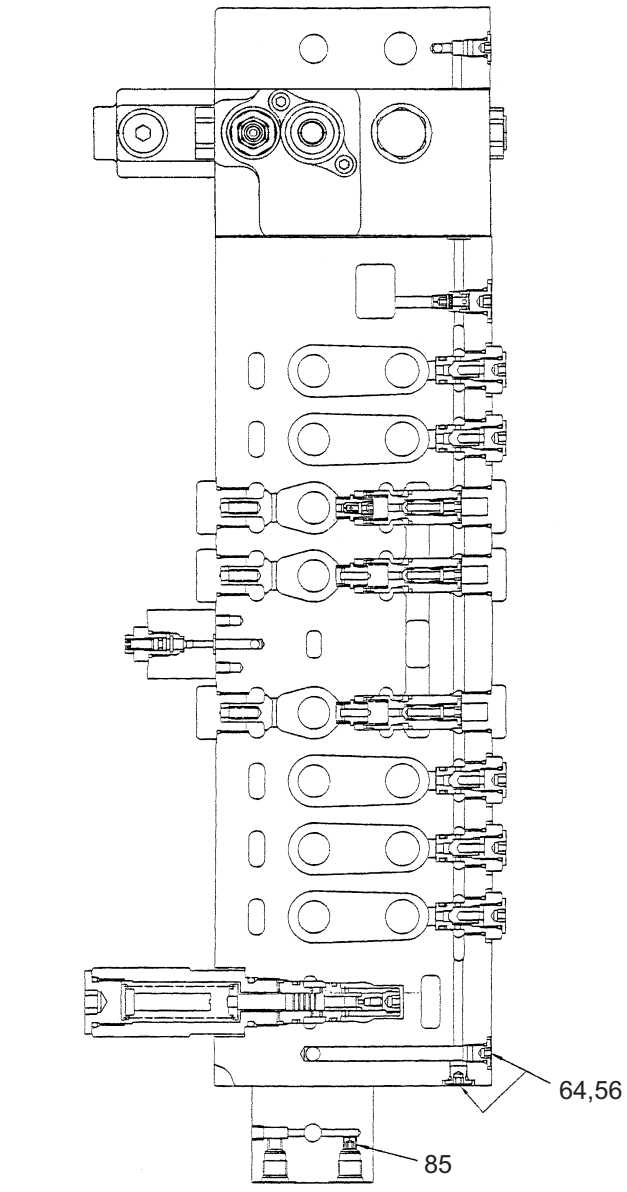


GRAPHIC_1D

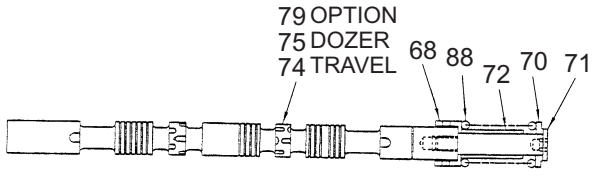
Figure 15

PUMP ADJUSTING

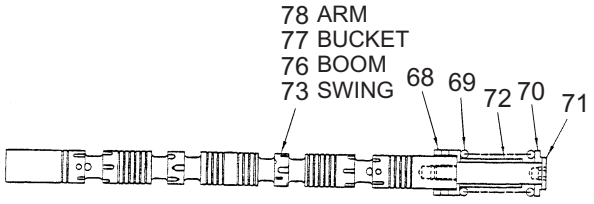
Control valve (5/5)



SECTION PP



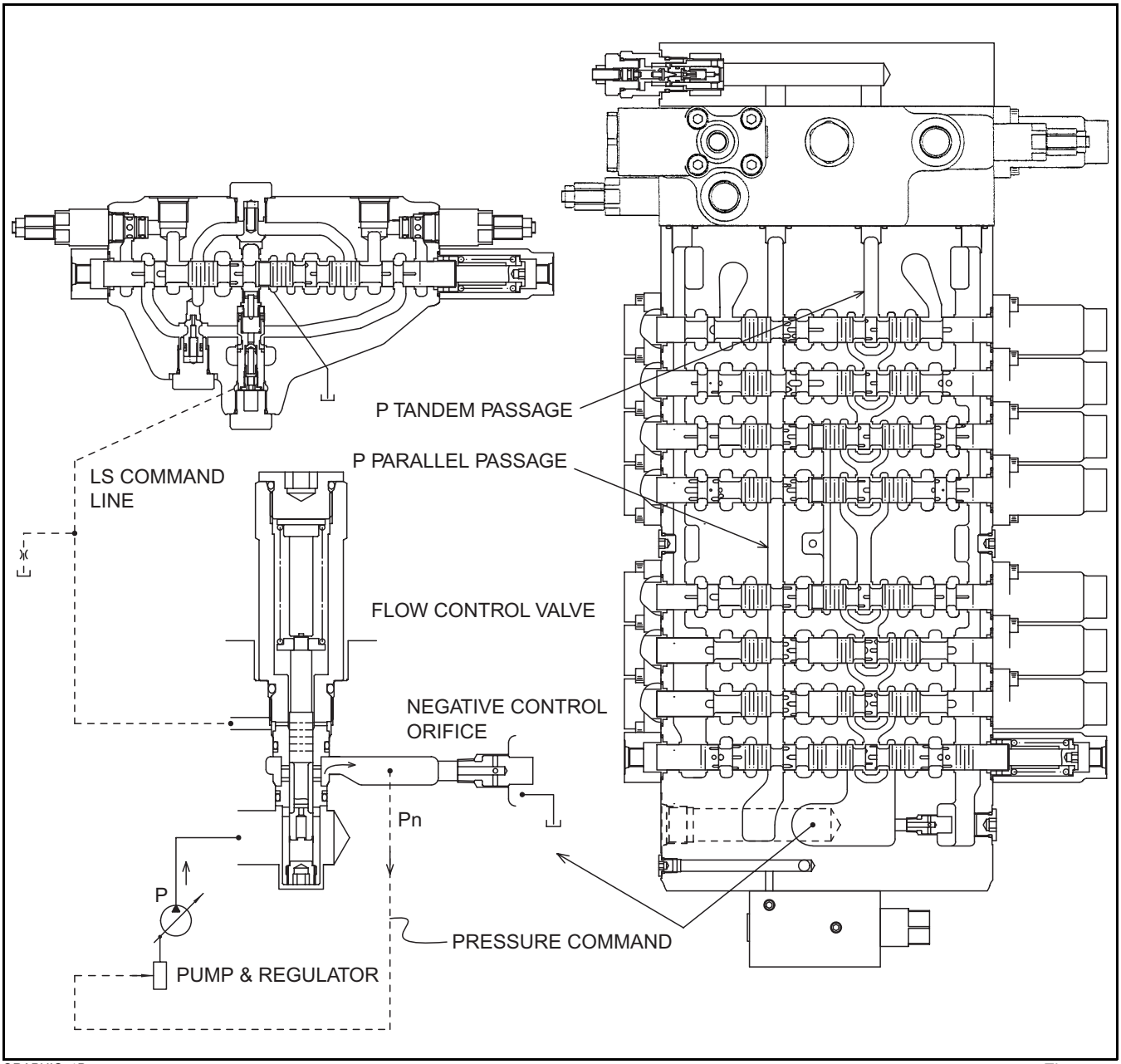
MAIN PLUNGER (TRAVEL,DOZER,OPTION)



MAIN PLUNGER (SWING,BOOM,BUCKET,ARM)

GRAPHIC_1D

Figure 25



GRAPHIC_1D

Figure 43

NEUTRAL POSITION

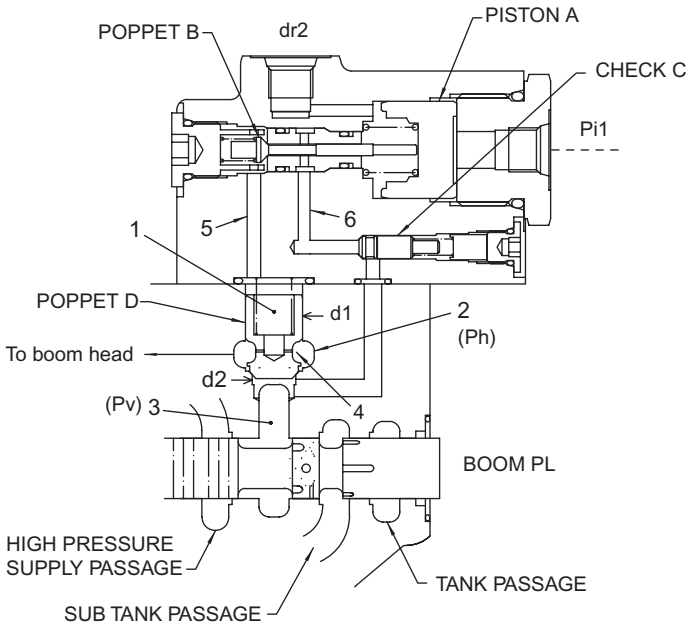
5)Load holding valve

The explanation is given with boom load holding valve.

a.At plunger neutral position (Pi1 pilot signal: OFF)

Piston A and poppet B are placed to the position shown in the figure by spring force, and passage 5 and 6 are blocked by poppet B.

Since chamber 1 is therefore connected to chamber 2 through orifice 4, the pressure is equivalent to the pressure (Ph). Then poppet D is securely seated in d1 > d2 condition and the flow between chamber 2 and chamber 3 is completely blocked.



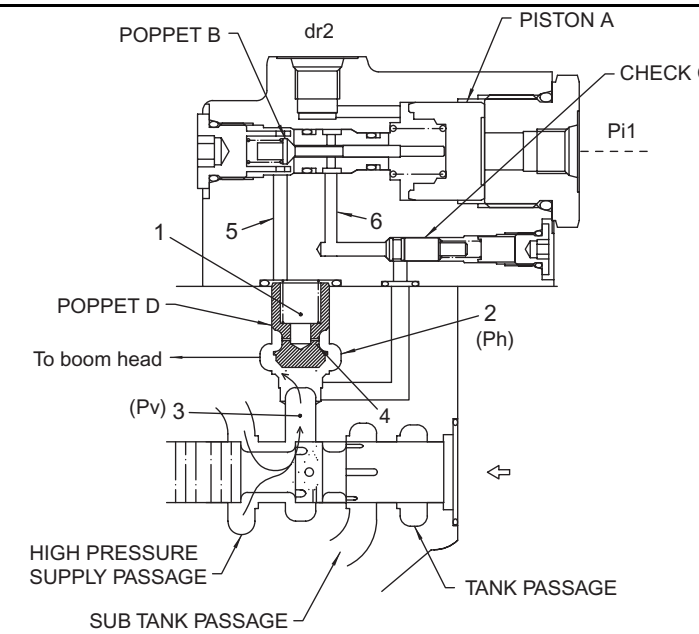
GRAPHIC_1D

Figure 58

b.In plunger operation

1.Boom up operation (Pv > Ph) (Pi1 pilot signal: OFF)

The plunger moves leftward and the oil in supply passage flows into chamber 3. Since the pressure of chamber 1 is connected to chamber 2 through orifice 4, the pressure is equivalent to the pressure (Ph) and then poppet D opens and the delivery oil from pump is supplied to the cylinder head side through high pressure supply passage.



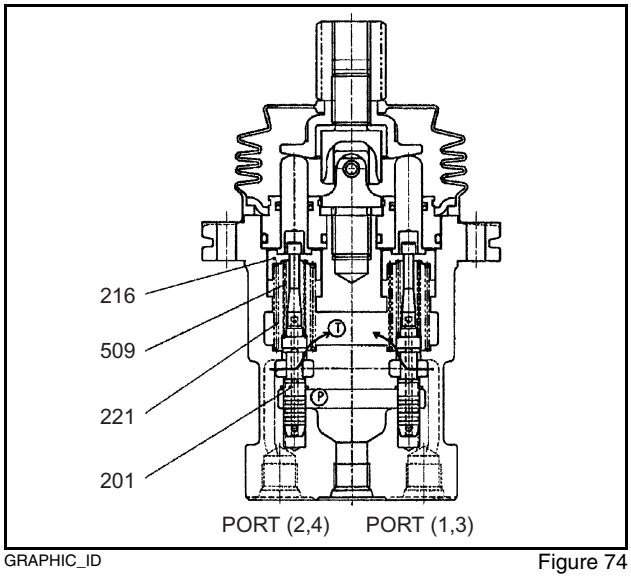
GRAPHIC_1D

Figure 59

Operation

1. Lever in neutral

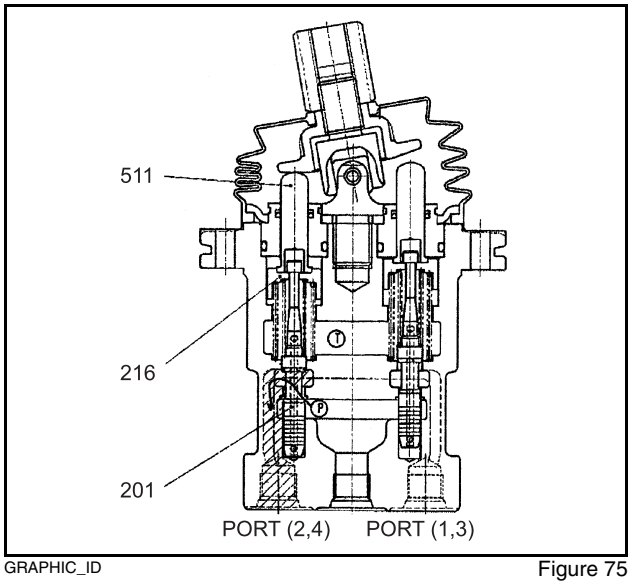
   The action of spring (509) (for secondary pressure setting) that determines the output pressure of the pilot valve does not act upon spool (201). Therefore, spool (201) (for return) is pushed up by spring (221) [spring seat (216)]. The output ports (2,4) connect with the T port. The result is that the output pressure is equal to the tank pressure.



GRAPHIC_ID Figure 74

2. When the pilot lever is tilted

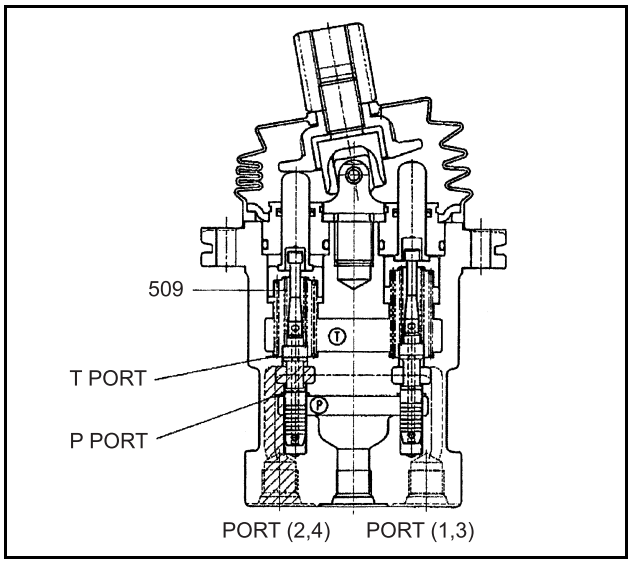
   When the lever is tilted and the push rod (511) strokes, the spool (201) [spring seat (216)] moves downward to make the port P to connect with the port 2, 4, with the result that the oil of the pilot pump flows to the port 2 ,4 to produce a pressure.



GRAPHIC_ID Figure 75

3. Lever held

   When the pressure at ports (2,4) rises to a level equivalent to the action of spring (509) that is set by tilting the lever, the hydraulic pressure balances the spring action. When the pressure of ports (2,4) rises above a set value, ports (2,4) and the P port close while ports (2,4) and the T port open. When the pressure at ports (2,4) falls below a set value, ports (2,4) and the P port open while ports (2,4) and the T port close. Thus the secondary pressure is kept constant.

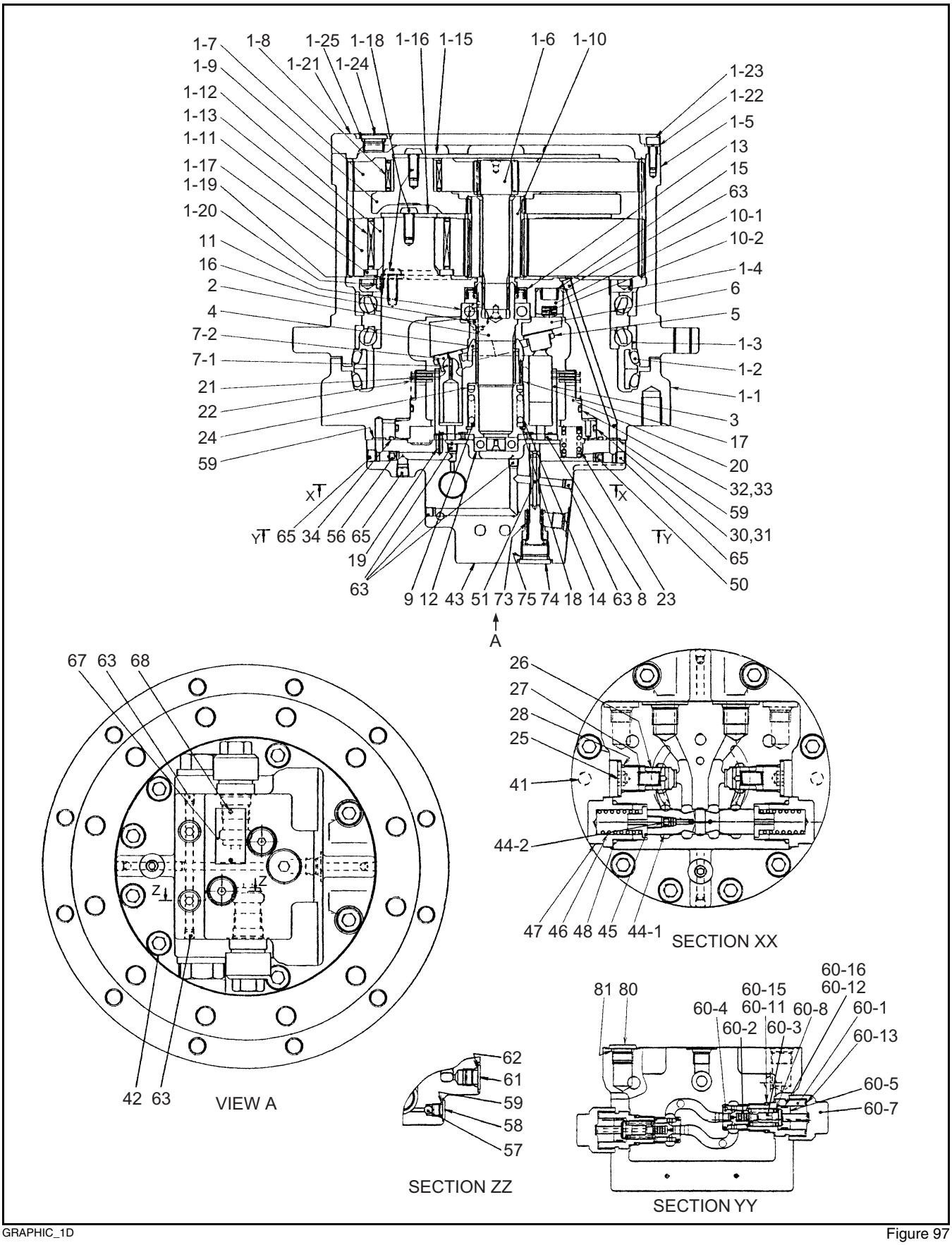


GRAPHIC_ID Figure 76

Tightening torque Nm (pound-ft)	No.	Parts	Qty	Tightening torque Nm (pound-ft)	No.	Parts	Qty
	M-1	Taper Roller Bearing	1		M-22	Return Plate	1
	M-3	Friction Plate	2		M-23	Cam Plate	1
	M-4	Separator Plate	2		M-24	Level Gauge	1
	M-5	Snap Ring	1		M-25	O-ring	1
	M-6	Needle Bearing	1		M-26	Housing	1
	M-7	O-ring	1		M-27	Collar	1
	M-8	O-ring	1		M-28	Oil Seal	1
	M-9	O-ring	1		M-30	Backup Ring	2
	M-10	Balance Plate	1		M-31	O-ring : 1B P21	2
	M-11	Piston	2		M-33	Backup Ring	2
	M-12	Teflon Ring	2		M-34	O-ring : 1B P26	2
	M-13	Plug : PT 1/4	2		M-35	Parallel Pin	2
	M-14	Bushing	4		M-36	Plug : PF 3/8	1
	M-15	Scrowave	4		M-37	O-ring : 1B P14	1
	M-16	Teflon Ring	4		M-38	Socket Bolt : M12 $\times$ 30	4
	M-17	Spring	13		M-39	Cover	1
	M-18	Piston	1		M-40	Plug	1
	M-19	Cylinder	1		70	Relief Valve Assy	2
	M-20	Support Spring	1		100	Bypass Valve Assy	2
	M-21	Piston Assy	7				

Construction

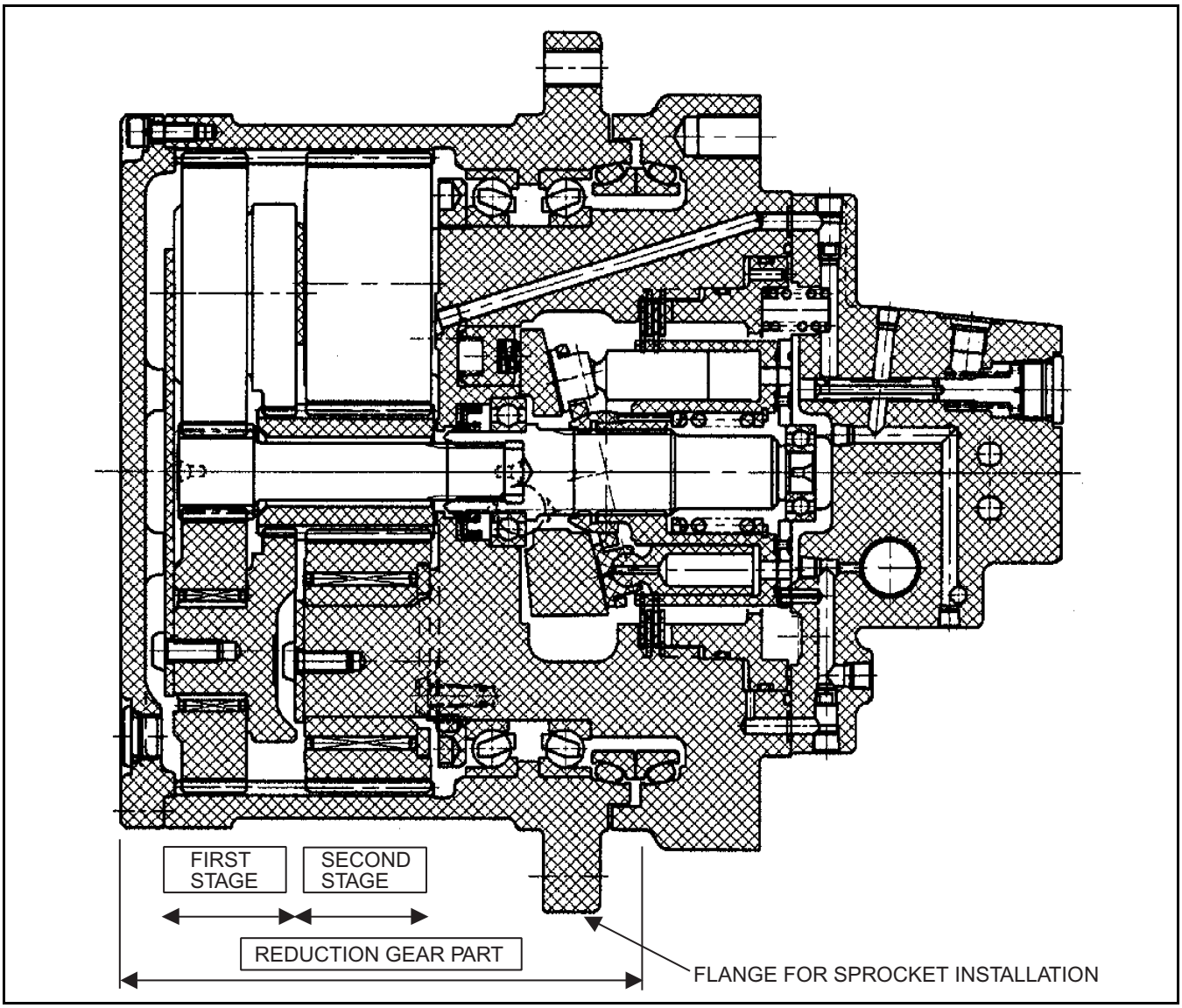
1. Structure of travel unit



GRAPHIC_1D

Figure 97

Reduction Gear



GRAPHIC_1D

Figure 107

The reduction unit has the following two functions.

1. Slow-down function

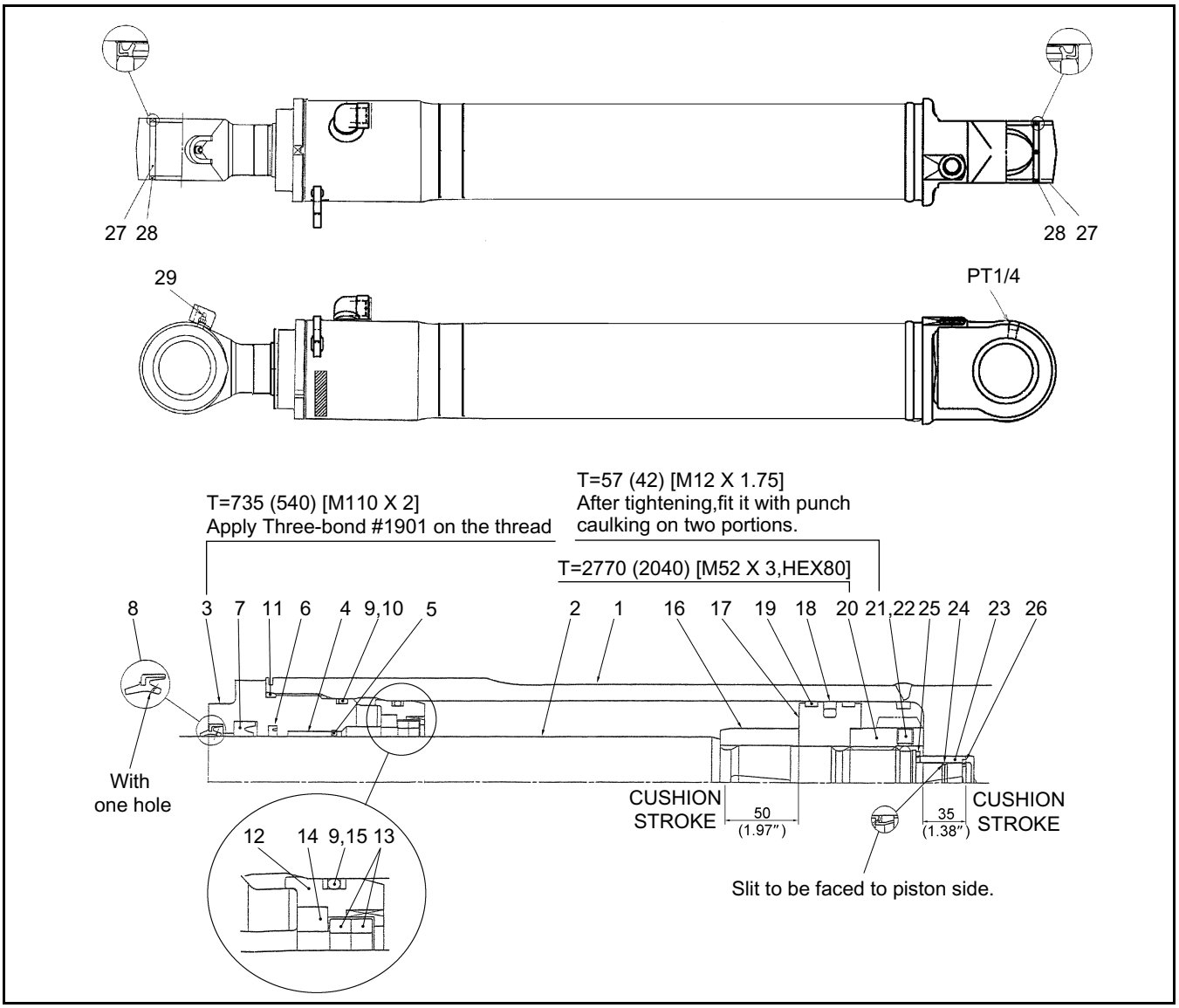
   The reduction unit is transmitted the rotation from hydraulic motor and changes the rotation as shown below.

   Rotation speed is reduced
   Torque is increased

2. Final power output function

   The final rotation power output (torque) is transmitted to the machine sprocket.

5. Swing Cylinder



GRAPHIC_1D

Figure 116

No.	NAME	QTY	No.	NAME	QTY	No.	NAME	QTY
1	Cylinder Tube Assy	1	11	O-ring	1	21	Set Screw	1
2	Piston Rod Assy	1	12	Holder	1	22	Steel Ball	1
3	Rod Cover	1	13	Cushion Seal	1	23	Cushion Bearing	1
4	Bushing	1	14	Collar	1	24	Cushion Seal	1
5	Snap Ring	1	15	Backup Ring	2	25	Snap Ring	1
6	Buffer Ring	1	16	Cushion Ring	1	26	Stopper	2
7	U-ring	1	17	Piston	1	27	Bushing	2
8	Wiper Ring	1	18	Seal Ring Assy	1	28	Wiper Ring	4
9	O-ring	1	19	Slide Ring	2	29	Grease Nipple	1
10	Backup Ring	1	20	Nut	1			

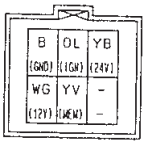
Code No. Parts Name Parts No. Use Applicable Machine	Specifications	Description

E - 22

Converter
YN77S00005F1
DC24V → DC12V

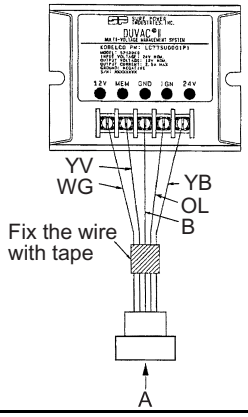
YB05 - 03001~
LA05 - 02001 ~
YT05 - 15001 ~
LF05 - 04001 ~

Input voltage	DC24V
Output voltage	DC12V
Output current	2.5A Max
Ground	Negative



VIEW A

HOUSING YAZAKI 7122-2262
TERMINAL YAZAKI 7114-2020



GRAPHIC_1D

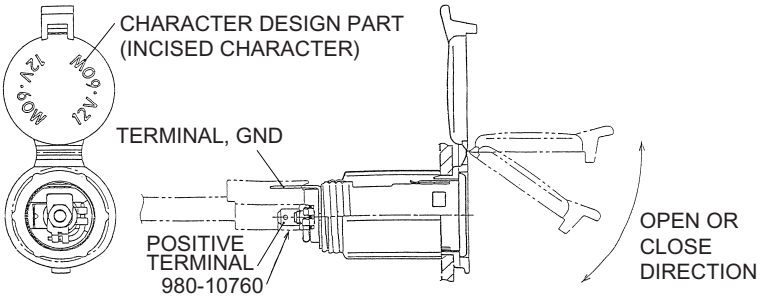
Figure 136

E - 23

Socket
YN81S01002P1
Power Socket

YB05 - 03001~
LA05 - 02001 ~
YT05 - 15001 ~
LF05 - 04001 ~

Rated voltage	DC12V
Insulation	More than 10MΩ at 500V megger



GRAPHIC_1D

Figure 137

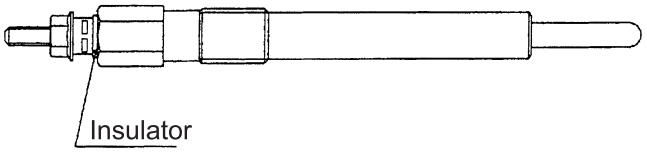
E - 35

Glow
VI8970476041
Glow plug

YT05 - 15001 ~
LF05 - 04001 ~

Type	QOS-Ⅲ 24V
Rated valtage	23.0V
Time to reach 800 ℃※	5sec
Collor of finish	Stem/Yellow, Insulator/Brack

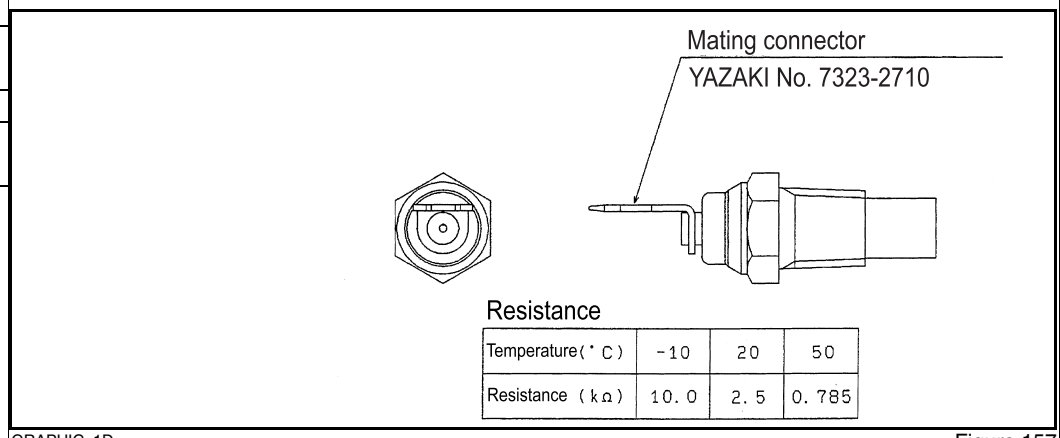
※ When appling rated voltage at normal temperature



GRAPHIC_1D

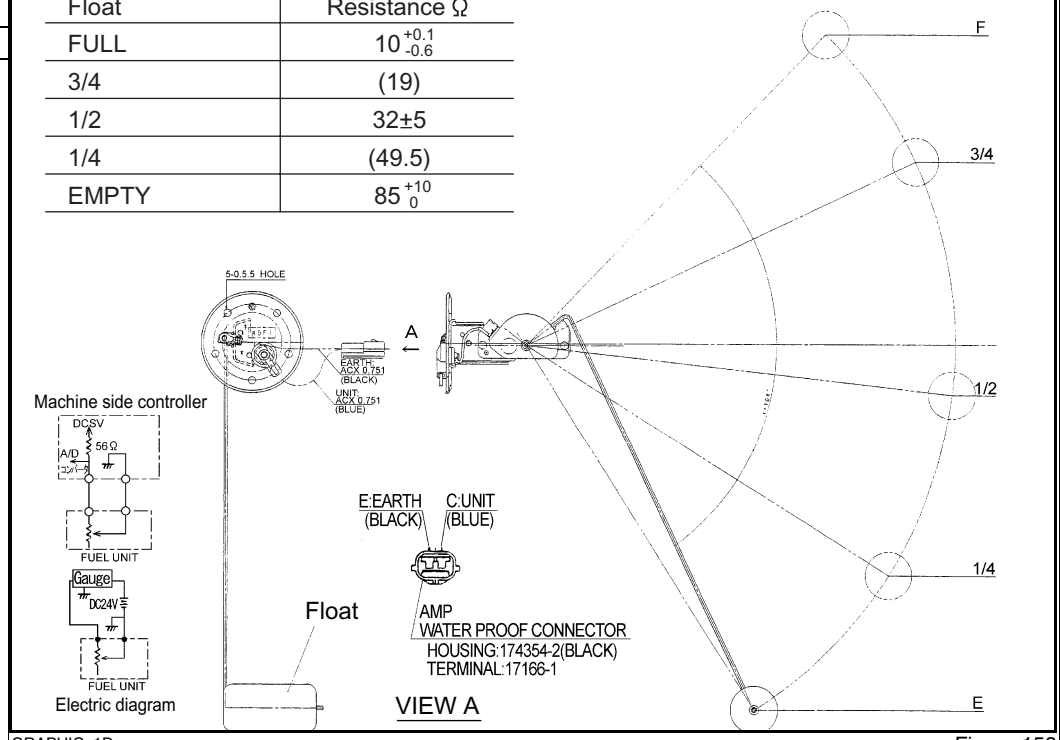
Figure 138

Code No. Parts Name Parts No. Use Applicable Machine	Specifications	Description
SE - 14 Engine coolant thermo sensor VI8970633010 Engine coolant thermo sensor YT05 - 15001 ~ LF05 - 04001 ~		



GRAPHIC_1D Figure 157

SE - 15 Fuel sending unit YN52S00045F1 Fuel level YN11 - 45001 ~ YQ11 - 06001 ~ YF05 - 02001 ~ YU05 - 02001 ~ YT05 - 15001 ~ LF05 - 04001 ~	Float operation	
	Float	Resistance Ω
	FULL	$10^{+0.1}_{-0.6}$
	3/4	(19)
	1/2	32±5
	1/4	(49.5)
	EMPTY	85^{+10}_{0}

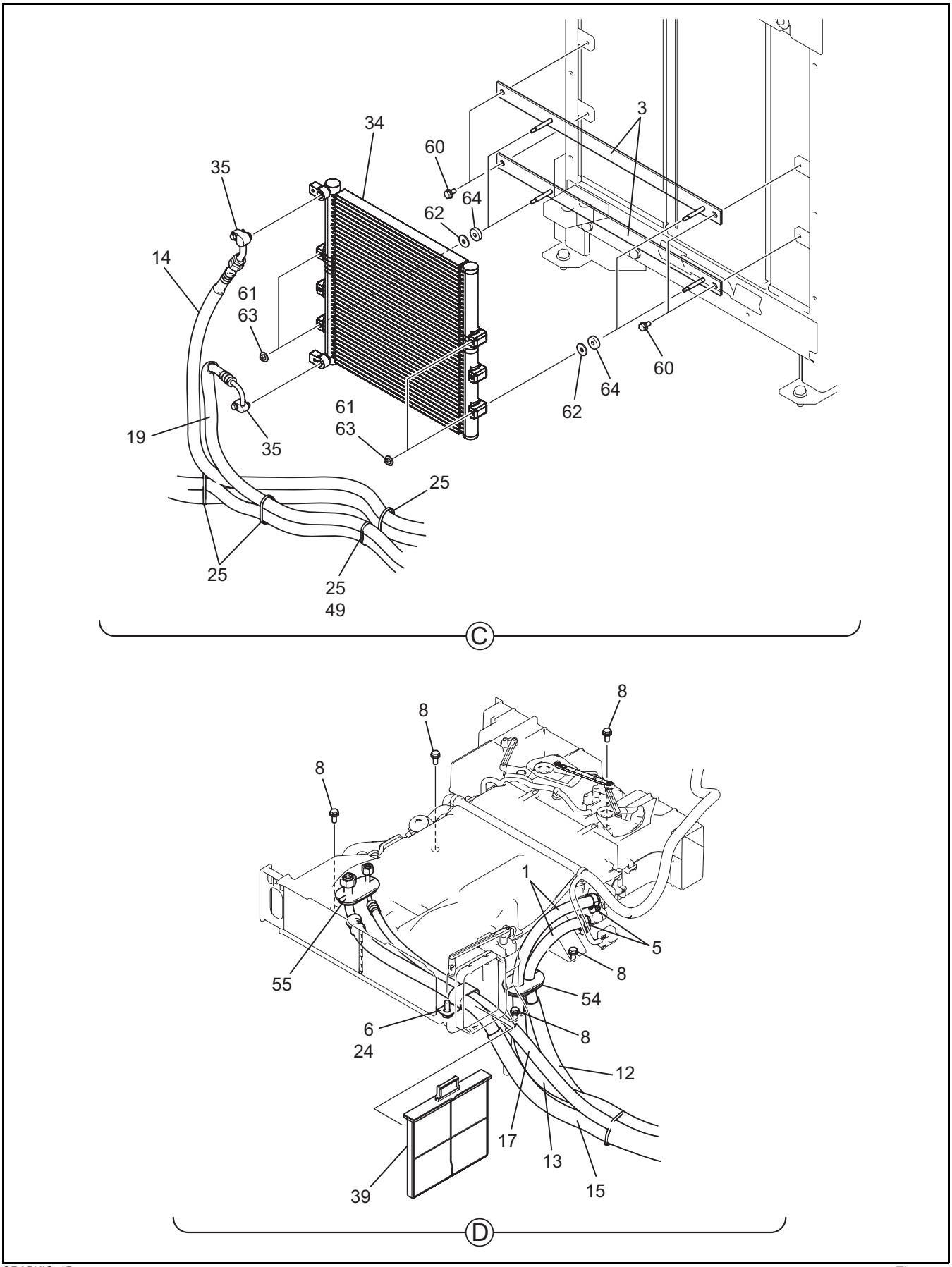


GRAPHIC_1D Figure 158

CNH America LLC reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

All data given in this publication is subject to production variations. Dimensions and weights are only approximate. Illustrations do not necessarily show products in standard condition. For exact information about any particular product, please consult your Dealer

Revision History				
Issue	Issue Date	Applicable Machines	Form Number	Remarks
First Edition	07-2008	E80B	5-15090	



GRAPHIC_1D

Figure 7

AIR CONDITIONER PIPING (2/2)

DISASSEMBLY AND ASSEMBLY

Precautions To Be Exercised In Operation

1. Special Refrigerator Oil
   This air conditioner uses special refrigerator oil SP20 for use with new refrigerant R134a. Oils other than SP20 may not be used. Since SP20 tends to absorb moisture and may corrode paint and resin, the following points must be noted:
   A. Do not keep open all pipe connections on a new compressor and the component parts of the installed refrigeration circuit
   (Remove valves and caps at the pipe openings of the compressor, just before connecting pipes. If you have removed a pipe joint for repair, put a cap to both ports immediately.)
   B. Use care so SP20 does not adhere to the painted surface and resin parts. In case SP20 has adhered to such surfaces, wipe it off immediately.
2. The receiver dryer is filled with desiccant to absorb moisture in the circuit. Therefore, remove the valve at the pipe port immediately before connecting pipes.
3. Tightening Torque
   A. Pipe Joints
   When connecting pipe joints, coat the O-ring with special oil (SP20) and fasten to the tightening torque indicated in the table, using a double spanner.
   B. Screws and Bolts
   Fasten to the tightening torque indicated in the table

Unit: Nm (pound-ft)

Pipe Fastening Part	Tightening Torque
D hose and compressor (M8 bolt)	19.6-24.5 (14-18)
D hose and condenser	19.6-24.5 (14-18)
L hose and condenser	11.8-14.7 (8.7-11)
L hose and receiver dryer (M6 bolt)	7.8-11.8 (5.8-8.7)
L hose and air conditioner unit	11.8-14.7 (8.7-11)
S hose and air conditioner unit	29.4-34.3 (22-25)
Expansion valve	1.96-2.45 (1.4-1.8)

Unit: Nm (pound-ft)

Screw Size	Tightening Torque
N4, T4 machine screw, M4	0.78-1.18 (0.58-0.87)
N5, T5 machine screw, M5	1.96-2.45 (1.4-1.8)
M6 (mounting part of L hose joint)	7.85-11.8 (5.8-8.7)
M6 (except mounting part of L hose joint)	9.8-11.8 (7.2-8.7)
M8 (mounting part of S,D hose joints)	19.6-24.5 (14-18)
M8 (mounting part of A/C unit)	9.8-11.8 (7.2-8.7)
M8 (other than those mentioned above)	11.8-15.7 (8.7-12)
M10	39.2-53.9 (29-40)

4. Amount of Oil for Compressor
   The compressor SD7H (HD type) is filled with 135cc (8.2cu/in) of oil. If the oil volume is small, seizure at high revolution and shortening of service life will occur. If the oil volume is large, the cooling ability will be deteriorated.
   Once the air conditioner is operated, part of the oil is dispersed in the refrigeration circuit. Therefore, when replacing the parts in right Table, adjust the oil level to that of table.

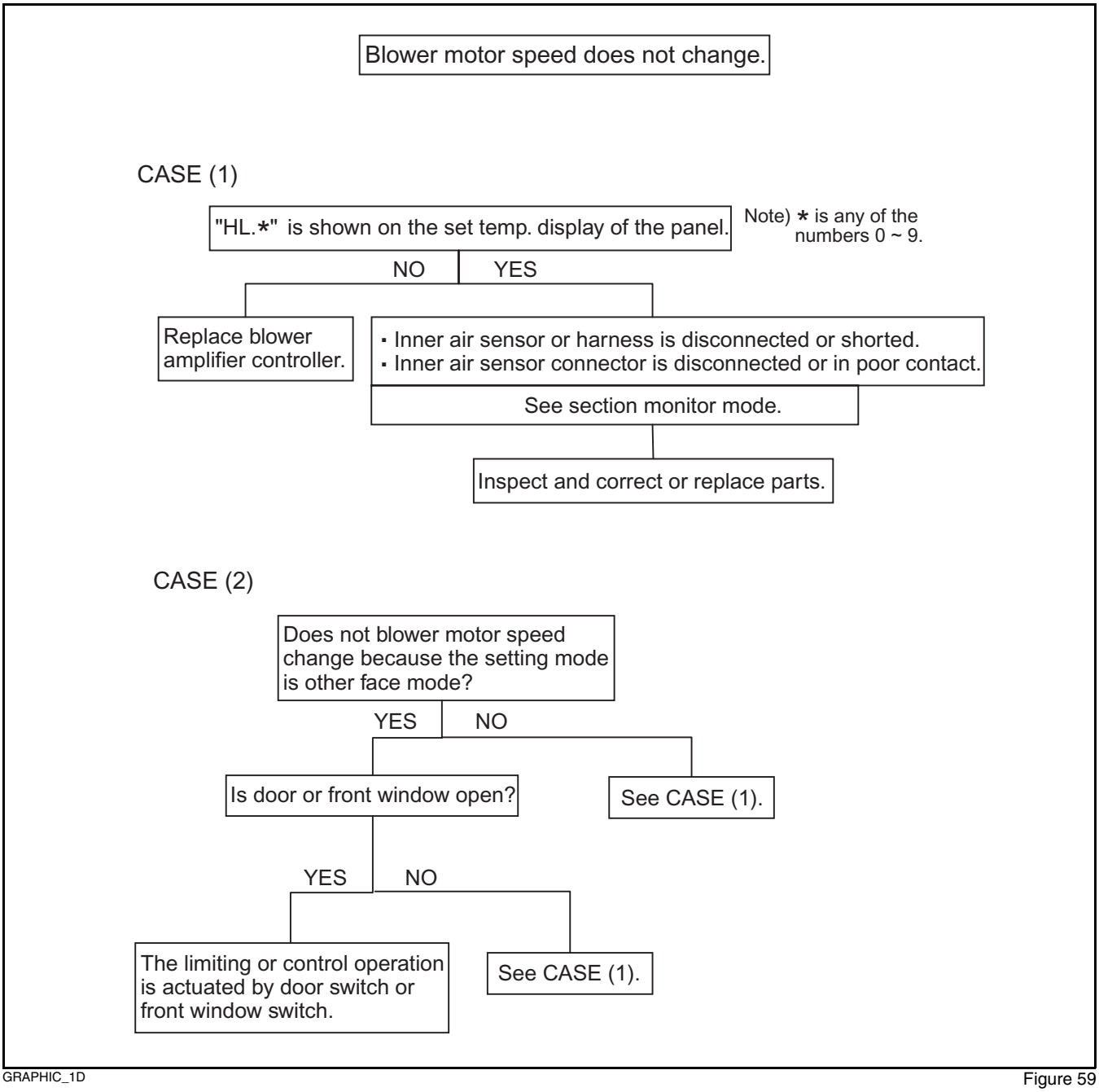
Replaced Parts	Amount To Be Filled In
Evaporator	40 cc (2.4 cu/in)
Condenser	40 cc (2.4 cu/in)
Compressor	Drain out the volume of oil left in the compressor to be replaced, from the new compressor.
Receiver dryer	20 cc (1.2 cu/in)
Hoses	20 cc (1.2 cu/in)

5. Before performing operation, stop the engine and turn off all power supplies to the equipment related to the air conditioner.
6. After the operation is over, confirm that all faults have been repaired completely, by operating the air conditioner.

(5)Removing Gauge Manifold

When the refrigerant level has been checked, disconnect the charging hoses from the compressor in the following manner :

1. Press the "L" shape metal fitting of the charging hose (blue) on the low pressure side against the service valve of the compressor so the refrigerant does not leak out and loosen the nut. As soon as the nut has been removed, disconnect the charging hose from the service valve.
2. Leave the high pressure side as it is till the high pressure gauge reading falls. [below 1MPa (140psi)].
3. Disconnect the charge hose (red) on the high pressure side the same way as on the low pressure side.



GRAPHIC_1D

Figure 59

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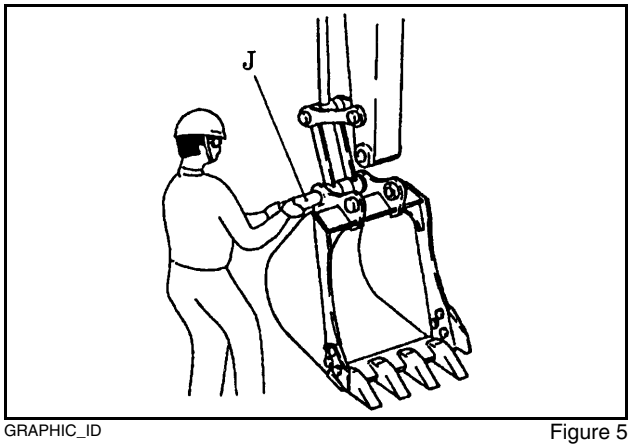
Revision History				
Issue	Issue Date	Applicable Machines	Form Number	Remarks
First Edition	07-2008	E80B	5-15100	

1. Removing bucket drive pin (J)
   Put bucket on the ground, position it so that the bucket drive pin (J) is not loaded, adjust bucket link, and pull out pin (J).



GRAPHIC_ID Figure 5

Attaching Bucket

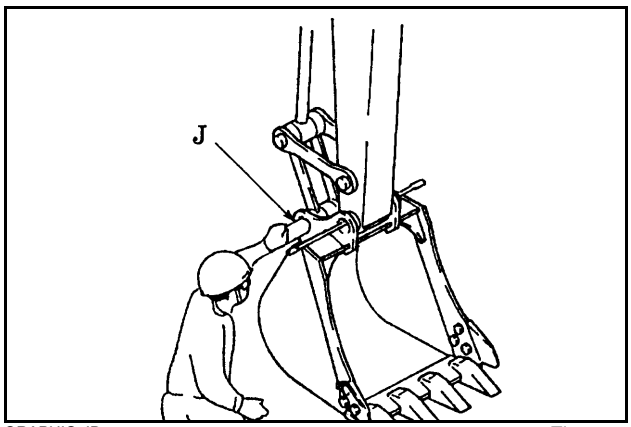
1. Attaching bucket drive pin (J)
   Attach bucket drive pin (J) first, then continue in the reverse procedure of the pulling out.

⚠ WARNING ⚠

When aligning the pin holes, do not put your finger in the pin holes in any circumstances, but align them visually.

NOTE: *Check that the seals are not scored and replace a faulty one if necessary.*

NOTE: *When inserting the pin, coat the shaft with grease.*



GRAPHIC_ID Figure 6

SWING

Removal of Swing Bracket and Cylinder

Preparation for removal

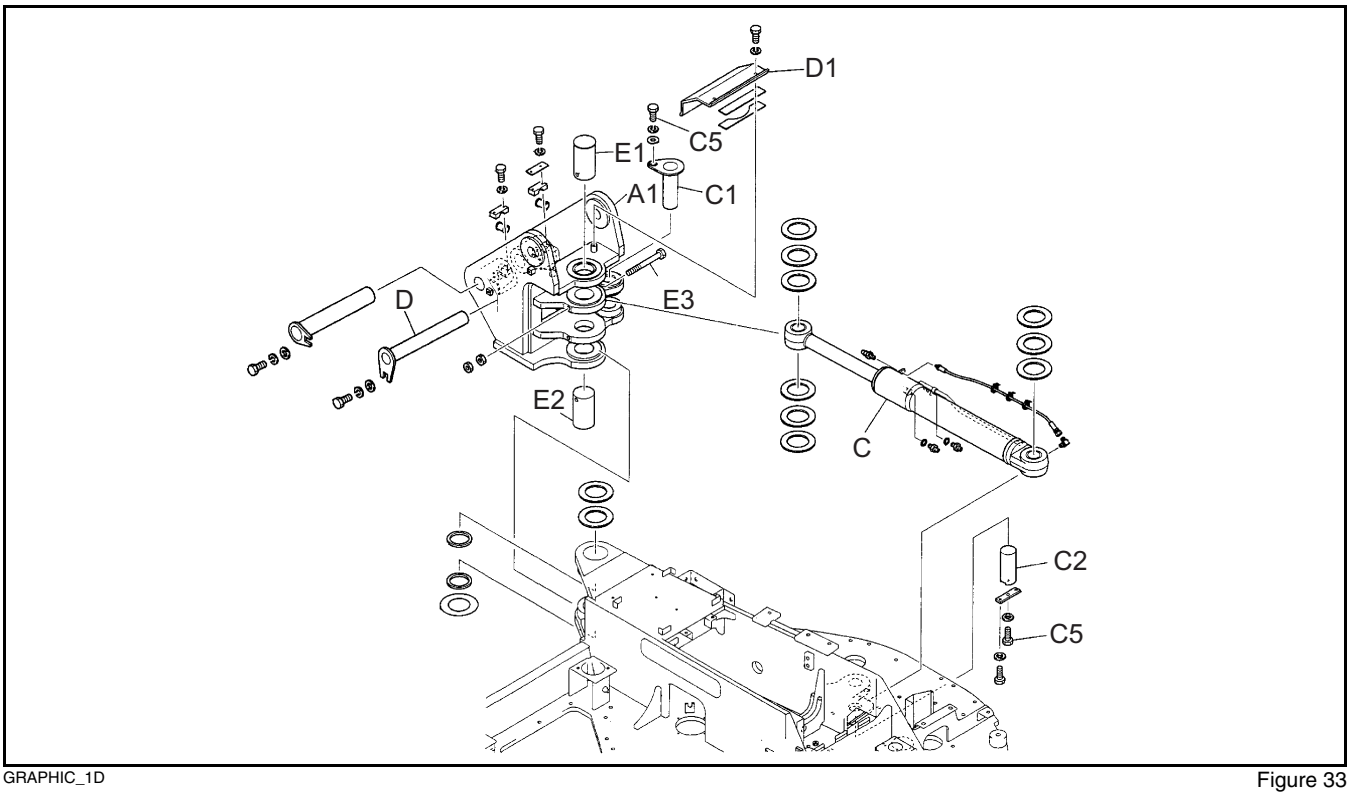
1. To make the removing work easy, swing by around 30° for leftward.
2. Remove cover (D1) then disconnect the hoses of bucket cylinder, arm cylinder and boom cylinder, and apply plugs to all the openings.

Removal of Swing Bracket (A9)

1. Removing the capscrew (C5) that is preventing the rod pin (C1) of swing cylinder (C) from coming out, remove the pin (C1).
2. Install the boom foot pin (D) to the original position on swing bracket (A1), then temporarily lift it up.
3. Removing two capscrews (E3) those are preventing the pin (E1) (E2) from coming out, remove the pin (E1) (E2).
4. Remove the swing bracket (A1).
   Weight of swing bracket : 245kg (540 lb)

Removal of Swing Cylinder (C)

1. Disconnect 2 connecting hoses for the swing cylinder.
2. Removing the capscrew (C5) that is preventing the head side pin (C2) of swing cylinder from coming out, remove the pin (C2).
3. Take out the swing cylinder (C) from the machine front side.
   Weight of swing cylinder : 70kg (154 lb)



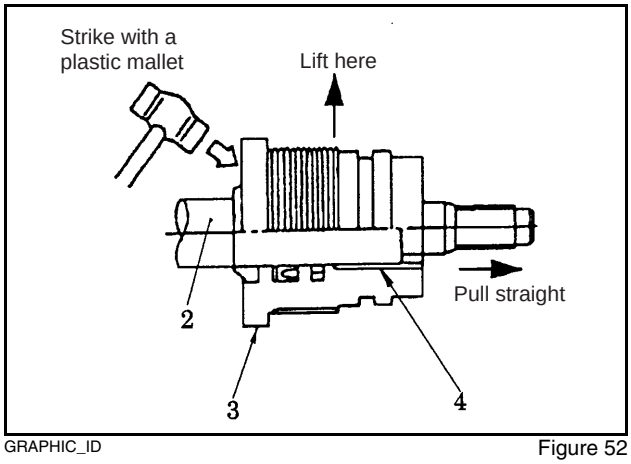
GRAPHIC_1D

Figure 33

Removing Rod Cover Assembly

Remove rod cover assy from piston rod (2). If it is too difficult to remove, strike flange section of rod cover (3) with plastic hammer.
Hang the rod cover assy with crane and remove it straight horizontally.

NOTE: *Care should be taken not to damage the bushing (4) lip section of link and seal with screw of piston rod (2) when pulling out rod cover (3).*



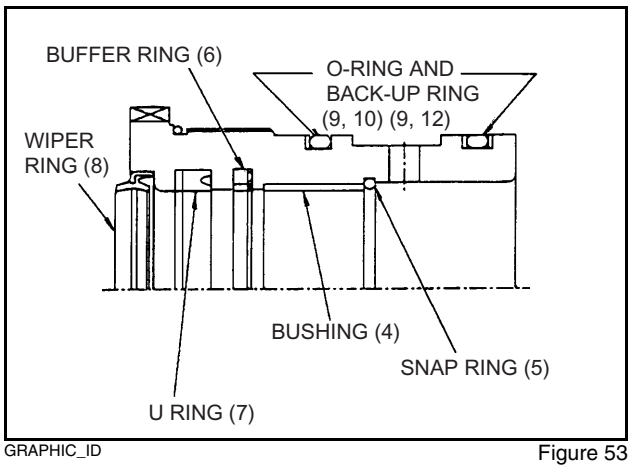
GRAPHIC_ID Figure 52

Disassembling Rod Cover Assembly

1. Removing buffer ring

   1) Buffer ring (6) (Teflon made seal) is fitted on the inside of rod cover (3). Pierce with pointed tool on the seal, raise it, insert spatula and take it out.

IMPORTANT: *Do not reuse the removed seal.*



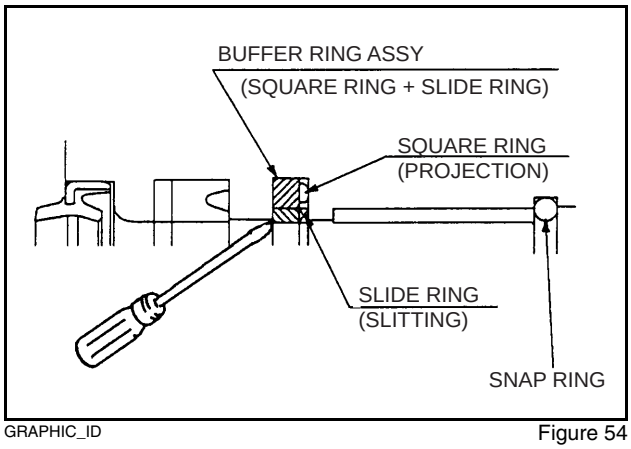
GRAPHIC_ID Figure 53

2. Removing U-ring (7) and wiper ring (8)

   1) Remove U-ring (7) with driver, etc.

   2) The wiper ring (8) is press-fitted.
   Pierce with driver, etc. on rubber and strike and remove it with driver.

IMPORTANT: *Do not reuse the removed seal.*

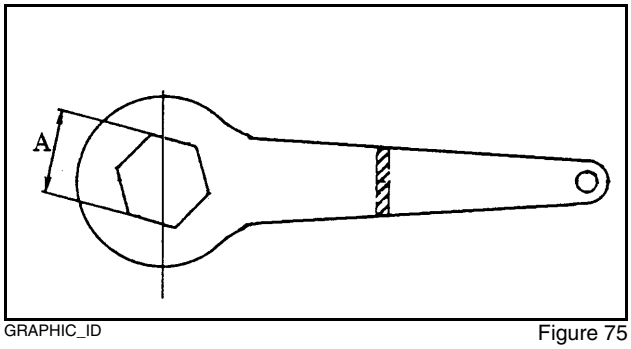


GRAPHIC_ID Figure 54

Tightening Torque

(1)Piston nut

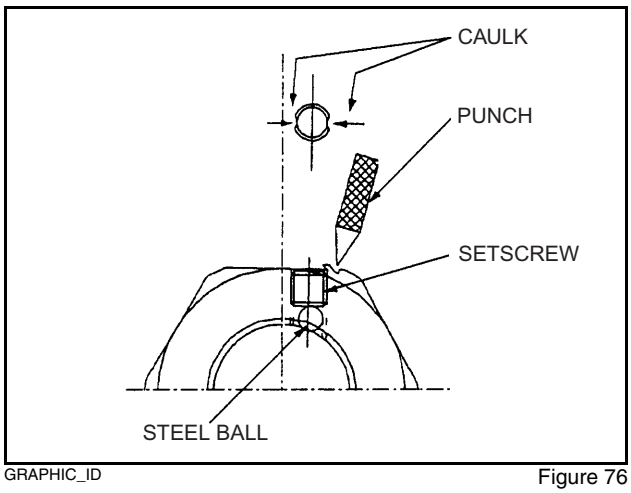
Cylinder name	Opposing flat A	Tightening torque Nm (pound-ft)
Boom	80 mm	3000 (2210)
Arm	75 mm	3000 (2210)
Bucket	60 mm	1420 (1050)
Dozer	80 mm	5100 (3360)
Swing	75 mm	2510 (1850)



GRAPHIC_ID Figure 75

(2)Setscrew

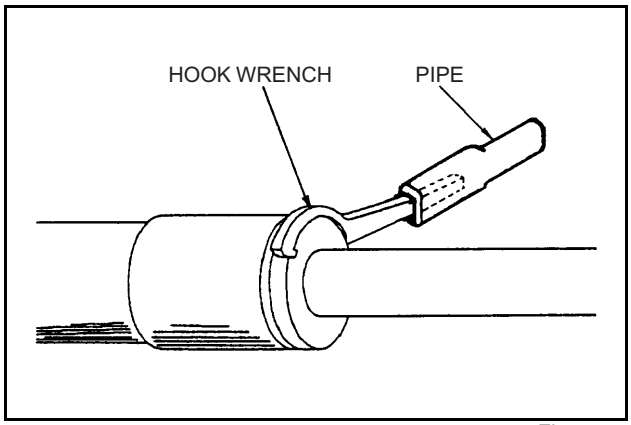
Cylinder name	Opposing flat	Tightening torque Nm (pound-ft)
Boom	6 mm	56.9 (42)
Arm	5 mm	31.5 (23)
Bucket	4 mm	16.2 (12)
Dozer	-	-
Swing	5 mm	31.5 (23)



GRAPHIC_ID Figure 76

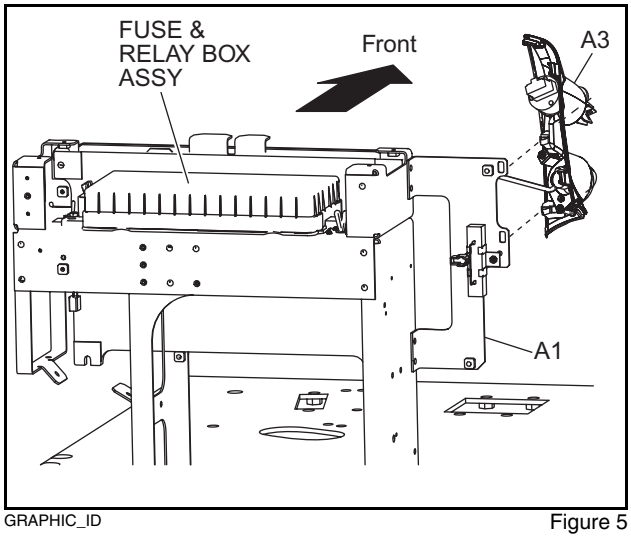
(3)Rod cover

Cylinder name	Tightening torque Nm (pound-ft)
Boom	834 (615)
Arm	570 (420)
Bucket	450 (330)
Dozer	1360 (1003)
Swing	736 (540)



GRAPHIC_ID Figure 77

Items	Phenomenon	Related parts	Abnormalities	Measures and corrective actions
4	The operation is unstable.	Air	Air is remained in cylinder.	1) Remove air. a) If cylinder is not equipped with air bleed port ; Release air by extending and retracting it at low speed several times. b) If cylinder is equipped with air bleed port ; Unload so that the internal pressure is not raised, loosen air breather and release air completely. (Reference) When cylinder has stopped in an emergency, cylinder may be extended and contracted slightly. This phenomenon is caused by the pressure of hydraulic oil, and easily occurs on the cylinder of which the stroke is longer.
	Great shock when changed from / to extension to / from retraction.	Pin bushing Pin	The space between fitting section and pin bushing is too large.	1) Measure dimension of pin and pin bushing, if it exceeds the specified dimension, replace it with new one.
	Noise when cylinder is worked.	Lubrication	Insufficient lubrication	1) Lubricate.
		Pin bushing Pin	Scuffing on engaged section	1) Replace it with new one, and lubricate.
		Hydraulic oil is expanded and contracted with change of temperature and pressure. Consequently the cylinder is also extended and retracted, so care must be taken in order not to mistake this for internal leakage. Check it for internal oil leakage in the constant temperature and pressure conditions.		



GRAPHIC_ID Figure 5

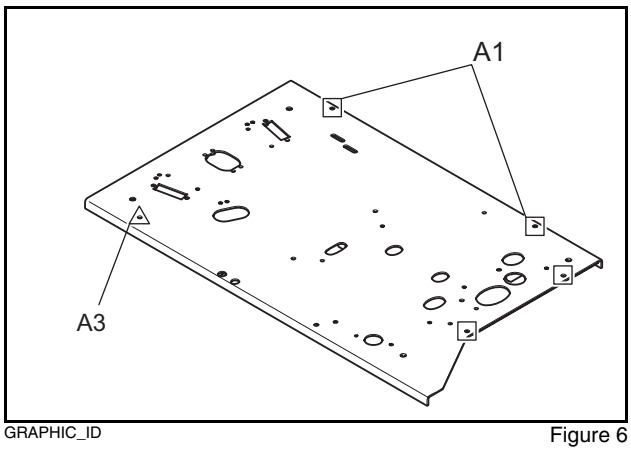
6. Remove cab attaching bolt

   5 capscrews (A1) M12× 65 (Mark ■) and 1 capscrew (A3) M12× 30. (Mark ▲)

7. Slinging cab

   A. Remove two plastic plugs at the front of the ceiling of the cab. Then place a wire sling with eye rings and a hook around the cab, as shown in Fig 7.

   B. Then lift up slowly avoiding interference with surroundings.
   Wire with hook ;
   Length 1.5m (4ft 11in)× Dia. 8mm (0.315in)× 3pcs.
   Weight of cab ; Approx. 250kg (550 lbs)

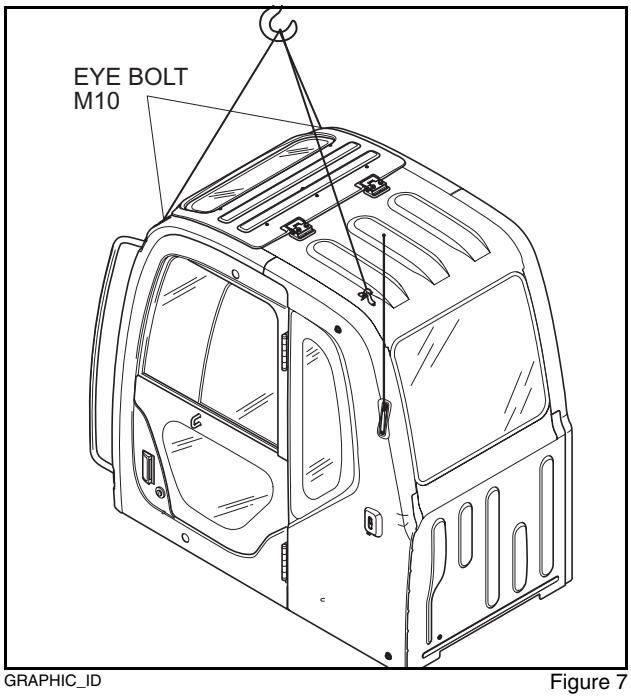


GRAPHIC_ID Figure 6

Installation

Install it in reverse order of removing according to the Tightening torque Table.

Tightening position	Allen wrench Hex (mm)	Tightening torque Nm (pound-ft)
Capscrew (A1)(A3)	19	80 (66)
Sems bolt M6 (A39)(A40)	Torx driver (T30)	8.5 (6.3)
Sems bolt M6 (A22)(A23)	Plus driver	5.0 (3.7)

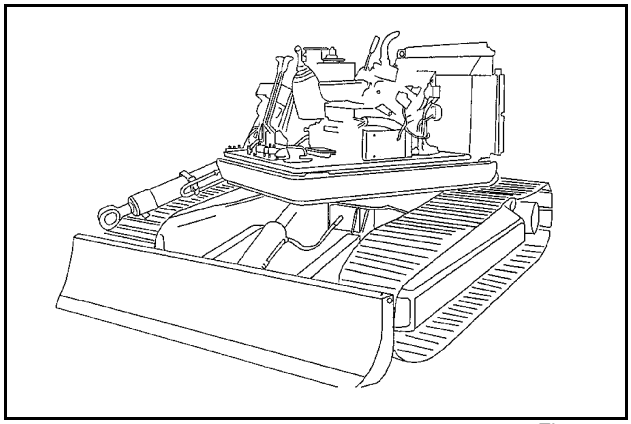


GRAPHIC_ID Figure 7

HYDRAULIC TANK

Preparation for Removal

1. Swinging upper structure 45 degrees.
   Swing upper structure to make the removal of suction hose for pump installed under tank easier.
2. Necessary to remove the hydraulic oil tank.

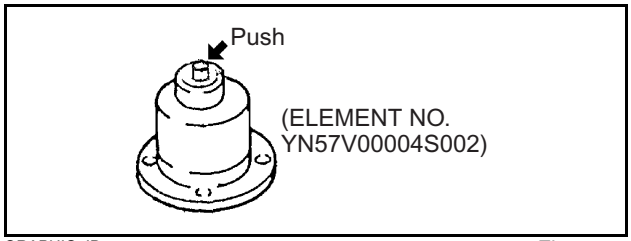


GRAPHIC_ID

Figure 26

3. Bleeding internal air of tank
   Press cap by finger to bleed internal air.

IMPORTANT: *Keep pressing until the hissing sound stops.*



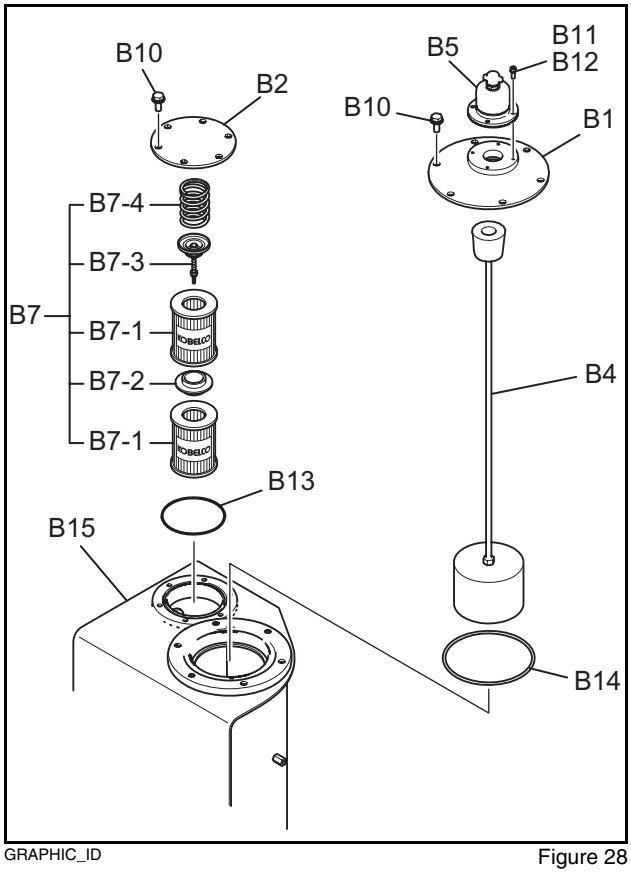
GRAPHIC_ID

Figure 27

4. Remove cover (B1)
   A. Remove 6 sems bolts (B10) M10×25.
   B. Remove cover (B1).
   C. Remove suction strainer (B4).

5. Remove cover (B2)
   A. Remove 6 sems bolts (B10) M10×25.
   B. Remove cover (B2).
   C. Remove filter element (B7).

6. Turn the handle of element assy (B7), and disassemble the removed filter element (B7).
7. Draining hydraulic oil
   Place pump in tank and draw up hydraulic oil.
   Capacity of tank : 72 L (19gal)



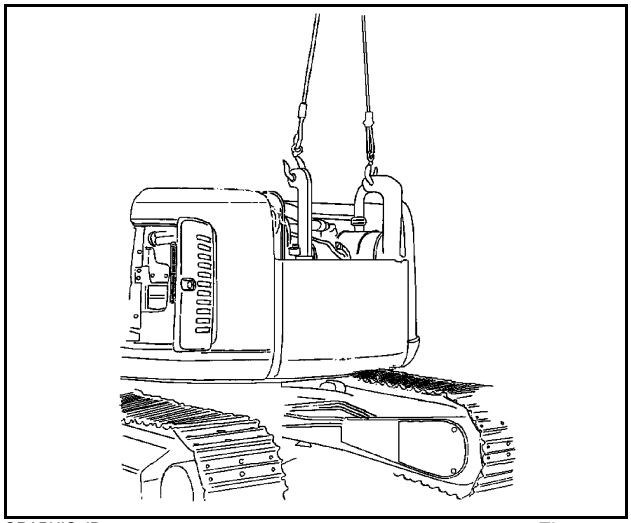
GRAPHIC_ID

Figure 28

COUNTERWEIGHT

Prepatation for Removal

1. Removing hood assy (3-2).
   Remove hood on engine.
2. Removing hood assy (3-1).
3. Preparing slinging jig
   Remove plug (A6), and attach weight slinging jig (See Chapter Tools.) to counterweight.



GRAPHIC_ID Figure 49

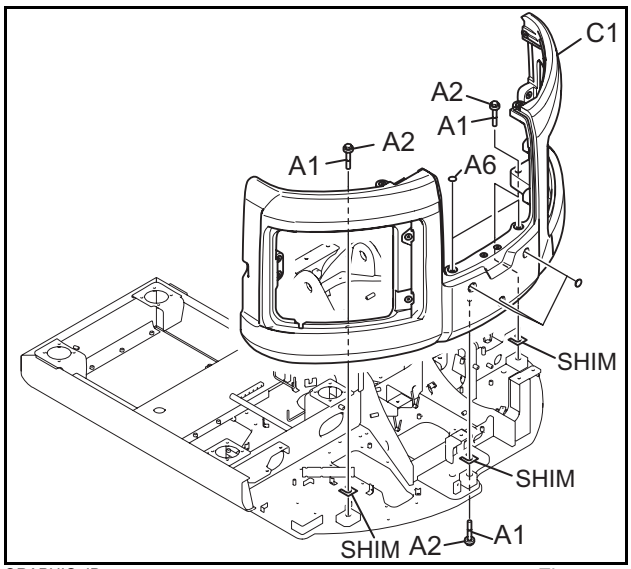
Removal

1. Lifting up counterweight temporarily
   Hook wire rope to slinging jig, and lift it and stretch wire rope to the degree where it is providing no slack temporarily.

   Weight of counterweight : Approx. 840 kg (1850 lbs)
   Wire more than ø10 (0.394 in) : 1.5 m (4 ft 11 in) × 2 pcs.
2. Removing counterweight

   A. Remove 3 capscrews (A1) M20 × 135.

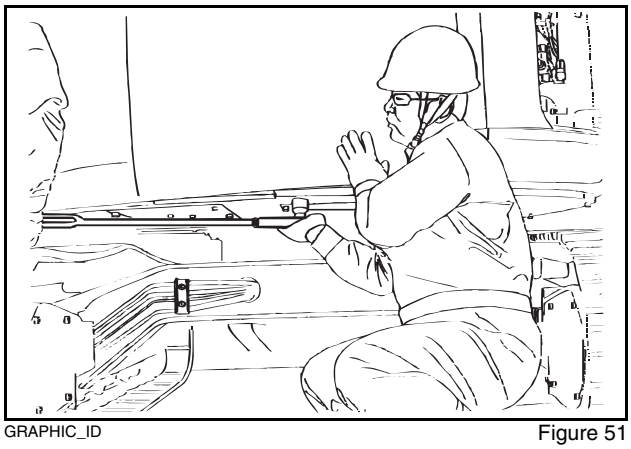
   B. Remove shim.



GRAPHIC_ID Figure 50

Installation

1. Install counterweight in the reverse procedure of removing.
2. Install shim as it was
3. Slinging counterweight
   Check that 3 attaching bolts can be screwed in by hand.
4. Apply Loctite #262 on capscrews (A1), and tighten them with washers (A2).
   Tightening torque : 490 Nm (361 pound-ft)
5. Remove slinging tools, and attach plugs (A6).



GRAPHIC_ID Figure 51

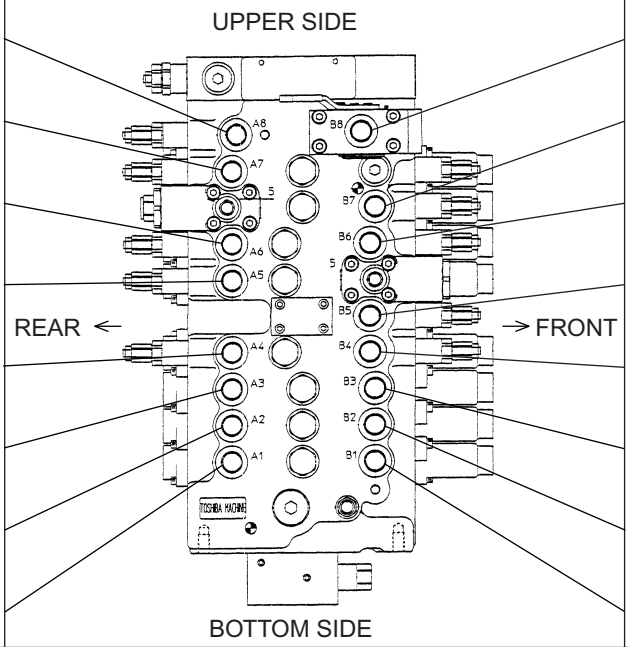
CONTROL VALVE

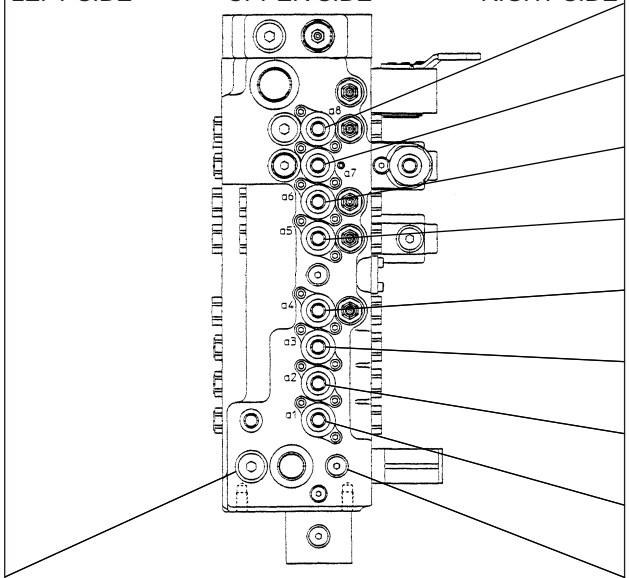
Preparation for Removing

1. Remove panel assy (2-1) (See Fig. 12)
2. Remove cover assy (2-5) (See Fig. 13)
3. Release air in hydraulic oil tank, open cover of suction element of hydraulic oil, and lower the level. (See Fig. 35)

Removal

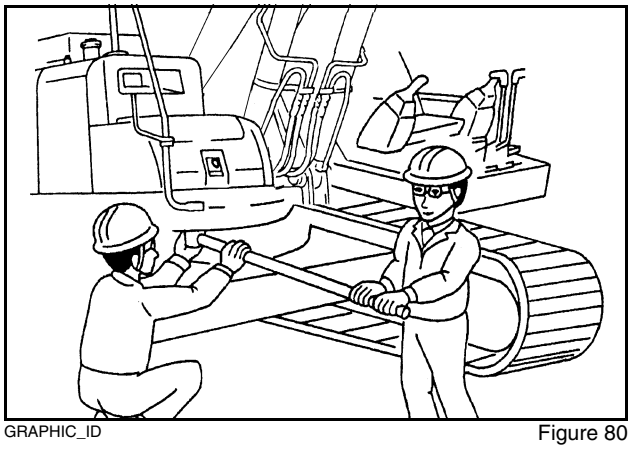
1. Removing hoses for each piping
   Attach tag on hose, and write port name on it,
   then remove hoses.

Ports	Functions	Ports on right sides (on machine)	Ports	Functions
A8	Option (Head)		B8	Option (Rod)
A7	Arm out		B7	Arm in
A6	Bucket dump		B6	Bucket digging
A5	Boom down		B5	Boom up
A4	Dozer down		B4	Dozer up
A3	Travel left (Forward)		B3	Travel left (Reverse)
A2	Travel right(Forward)		B2	Travel right (Reverse)
A1	Swing (Right)		B1	Swing (Left)

Ports	Functions	Ports on rear sides (on machine)	Ports	Functions
			a8	Option (Head)
			a7	Arm out
			a6	Bucket dump
			a5	Boom down
			a4	Dozer down
			a3	Travel left
			a2	Travel right
			a1	Swing (Right)
Pr	Back press. Compensaton		Ps	LS press. detection

3. Removing upper frame attaching bolts
   Remove 23 capscrews (B31) M16×85 and a reamer bolt (B30) used to install swing bearing and upper frame.

4. Slinging upper frame
   Sling according to Fig. 78, and remove upper frame and put it on a stand.
   Weight : Approx. 5 ton (11,000lbs)



GRAPHIC_ID Figure 80

Installation

1. Installing is done in the reverse order of removing.
2. Cleaning mating surfaces of upper frame and swing bearing.
3. Applying Loctite #515 on mating surface.
4. Slinging upper frame
   Match marks and install it with three reamer bolts temporarily.

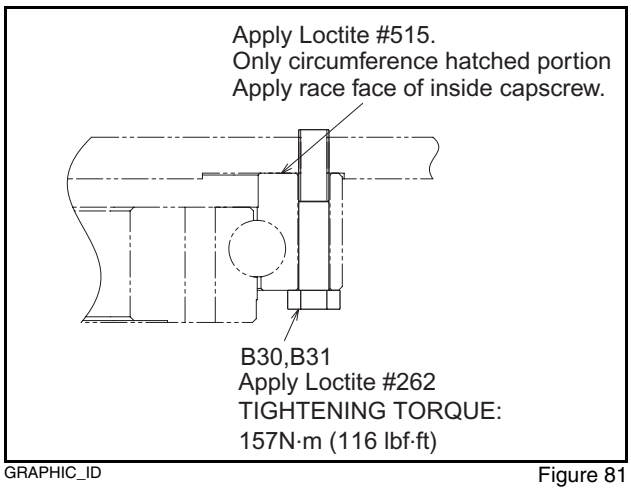
NOTE: *Confirm the reamer bolt positions referring to Fig. 82.*

24 mm; Apply Loctite #262
Tightening torque : 157 Nm (120 pound-ft)

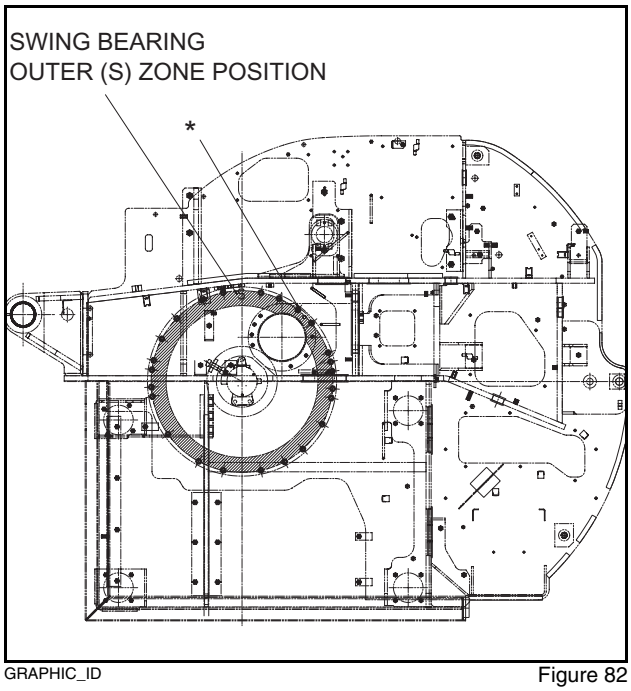
5. Install swing bearing

   Install 23 capscrews (B31) M16×85.
   24 mm; Apply Loctite #262
   Tightening torque : 157 Nm (116 pound-ft)

   Install a reamer bolt (B30).
   24 mm,
   Tightening torque : 157 Nm (116 pound-ft)



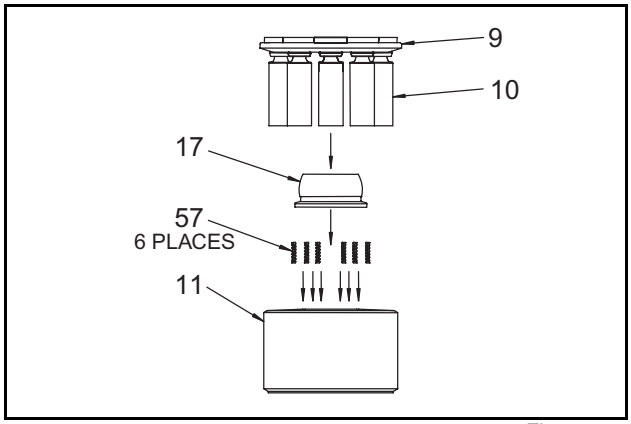
GRAPHIC_ID Figure 81



GRAPHIC_ID Figure 82

C. Installing of piston assembly
Install return plate (9), which is installed spring (57), retainer SPH (17), and piston assembly (10), into cylinder (11).

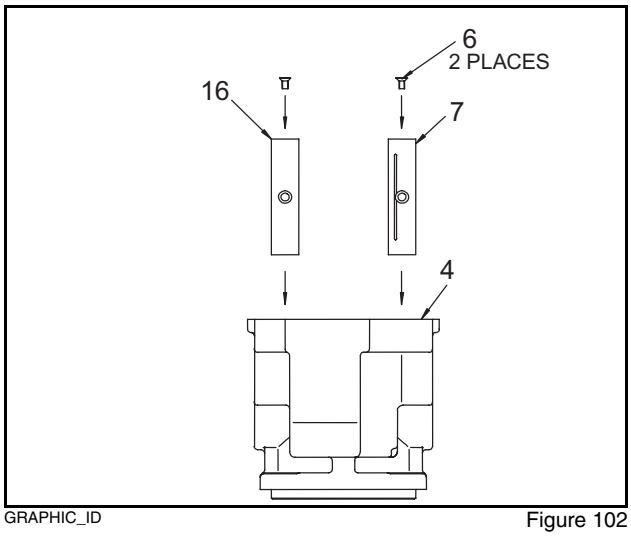
ATTENTION: *Refer to matchmark, which is put on the side faces of return plate (9) and cylinder (11) prior to disassemble it, install piston assembly (10) to the original hole.*



GRAPHIC_ID Figure 101

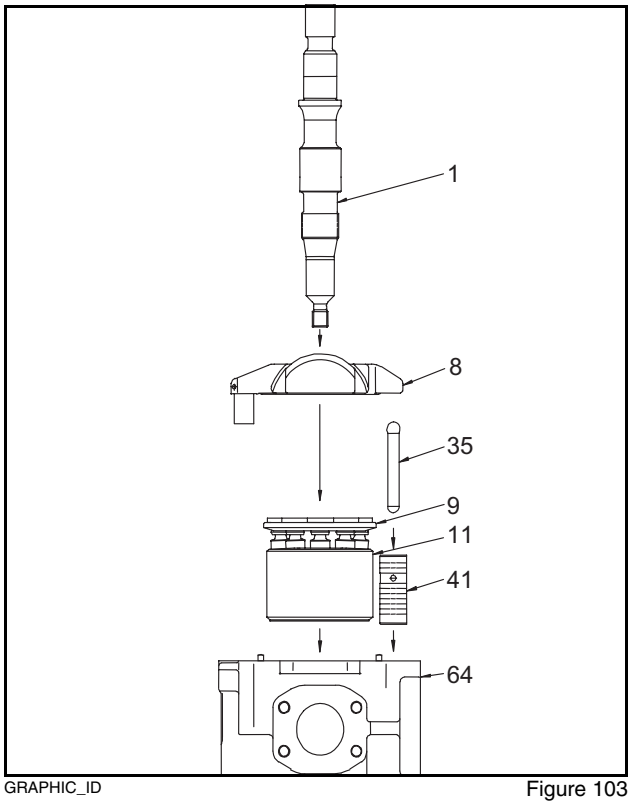
D. Installing of cradles
Install cradles (7) (16) into housing (4), and tighten them to the specified torque 5.9 Nm (4.4 pound-ft) with socket head screw (6) (Opposing flats 3).

NOTE: *Tighten socket head screw (6) temporarily to position cradles (7) and (16) in parallel. And apply hydraulic oil to cradles (7) and (16), place cam (8) on them, and get the smooth movement of cradles by tilting several times. Then remove cam (8) once and tighten socket head screw (6) to specified torque.*



GRAPHIC_ID Figure 102

E. Installing shaft
Apply hydraulic oil to port plate (12) (sliding surface with cylinder (11)) which is installed by the procedure shown in Item (B). And place the port plate on cylinder (11) which is installed by the procedure shown in Item (C). Apply hydraulic oil to the shoe sliding surface of piston assembly (10) and place cam (8) on the shoe sliding surface.
Install shaft (1) so as to connect to the spline of cylinder (11).
Install power piston assembly (41) on cover (64) and install rod PW (35) on power piston assembly (41).



GRAPHIC_ID Figure 103

Maintenance Standard

After disassembly of pump, if any remarkable damage was found on any part or the wear of each sliding part is more than the standard value, replace the parts with new ones.

Table 1

Parts	Inspection and Measurement location	Standard (Service limit)	Measuring Instrument	Corrective action
Piston assembly (10)	Roughness of shoe sliding surface	0.8 S	Surface roughness meter	Correct by paper lapping
	Flaw depth of shoe sliding surface	0.4mm (0.016in) or less	Micrometer	Replace with a new one
	Looseness of connection part between caulked piston and shoe	0.4mm (0.016in) or less	Dial gauge	Replace with a new one
	Outer diameter of piston	Hardly worn out. In case of flaw or seize, replace it with new one.		
Cam (8)	Roughness of surface	0.8 S	Surface roughness meter	Lapping
Cylinder (11)	Roughness of end surface	0.4 S	Surface roughness meter	Lapping
	Piston bore	Hardly worn out. In case of flaw or seize, replace it with new one.		
Port plate (12)	Roughness of surface	0.8 S	Surface roughness meter	Lapping
Piston assembly (10) Cylinder (11)	Gap between piston outer diameter and piston bore	0.04mm (0.0016in) or less	Micrometer Pneumatic Micrometer	Replace with a new one

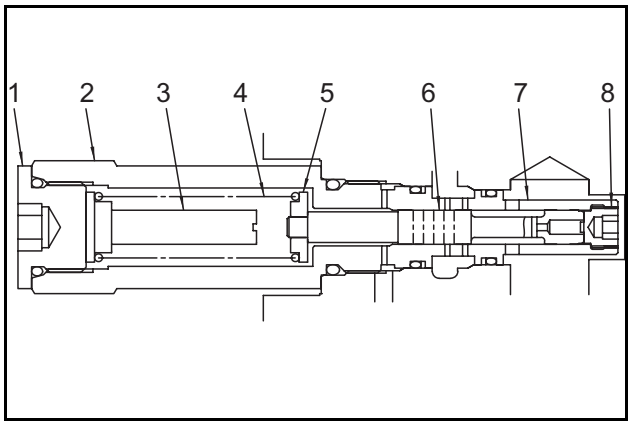
Table 2

Parts	Inspection and Maintenance Standard
Taper roller bearing (5) Needle bearing (20)	If flaking on inner and outer race is found, replace the bearing with a new one. After disassembling replace the bearing with a new one, and reassemble it.
Oil seal (2)	If flaw on lip is found, replace the oil seal with a new one. After disassembling replace the oil seal with a new one, and reassemble it.
O-ring (18),(21),(26),(41),(43),(54),(64),(73)	If flaw on O-ring is found, replace the O-ring with a new one. After disassembling replace the O-ring with a new one, and reassemble it.

8. Disassembling of flow control valve

   A. Loosen cap (2) and remove it as an assembly.
      Tightening torque : 100 Nm (74 pound-ft)

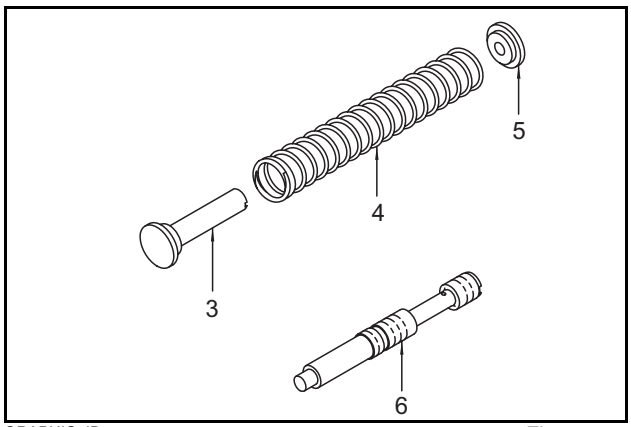
   B. Remove cap (1), and remove spring retainer (3), spring (4), spring retainer (5) and spool (6).
      Tightening torque : 60 Nm (44 pound-ft)



GRAPHIC_ID Figure 144

NOTE: *When the cap (1) is removed, spring reacts with the force of 90 N (20.2 lbs) to 100 N (22.5 lbs). Hold down the cap to prevent the parts jumping out, and remove every part.*

Do not disassemble the cap (8) because it was caulked.

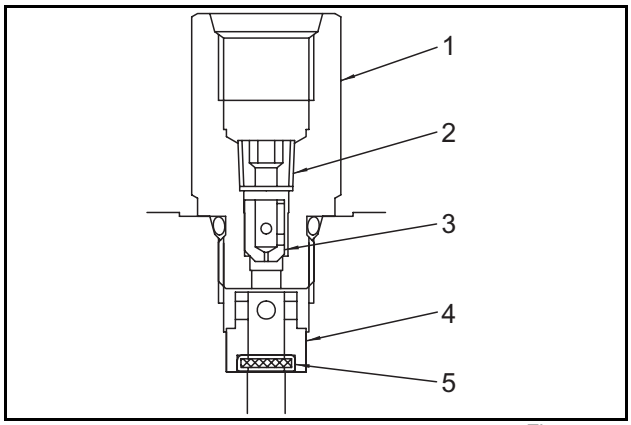


GRAPHIC_ID Figure 145

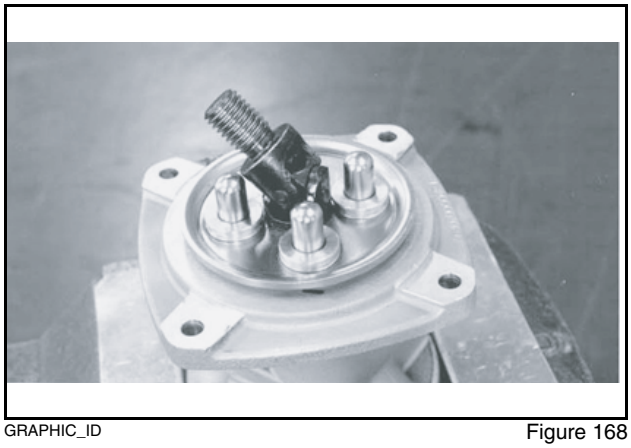
9. Disassembling of slow return check valve

   A. Loosen cap (1) and remove filter retainer (4) and filter (5).
      Tightening torque : 30 Nm (22 pound-ft)

NOTE: *Direct the large rounded corner of the filter to the cap.*

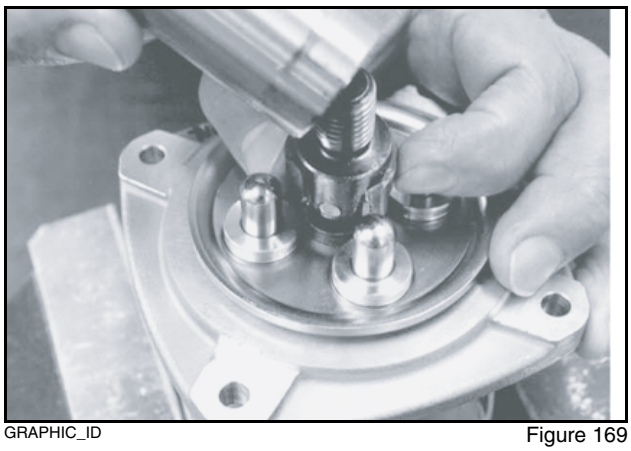


GRAPHIC_ID Figure 146



GRAPHIC_ID Figure 168

5. Install Jig A



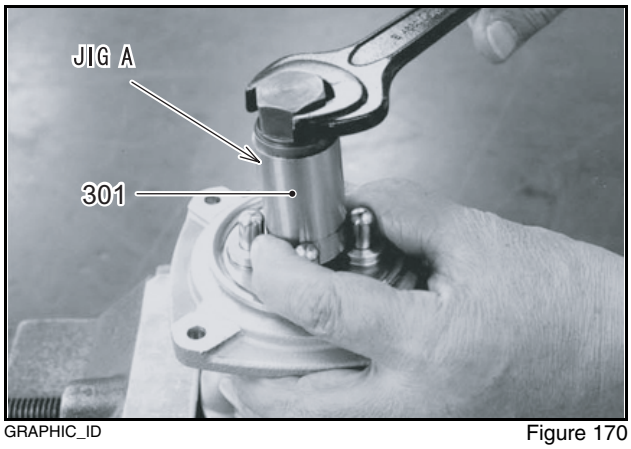
GRAPHIC_ID Figure 169

Turn joint (301) in counterclockwise with Jig A to remove.

Jig A : See Jig in this section.

: 24mm

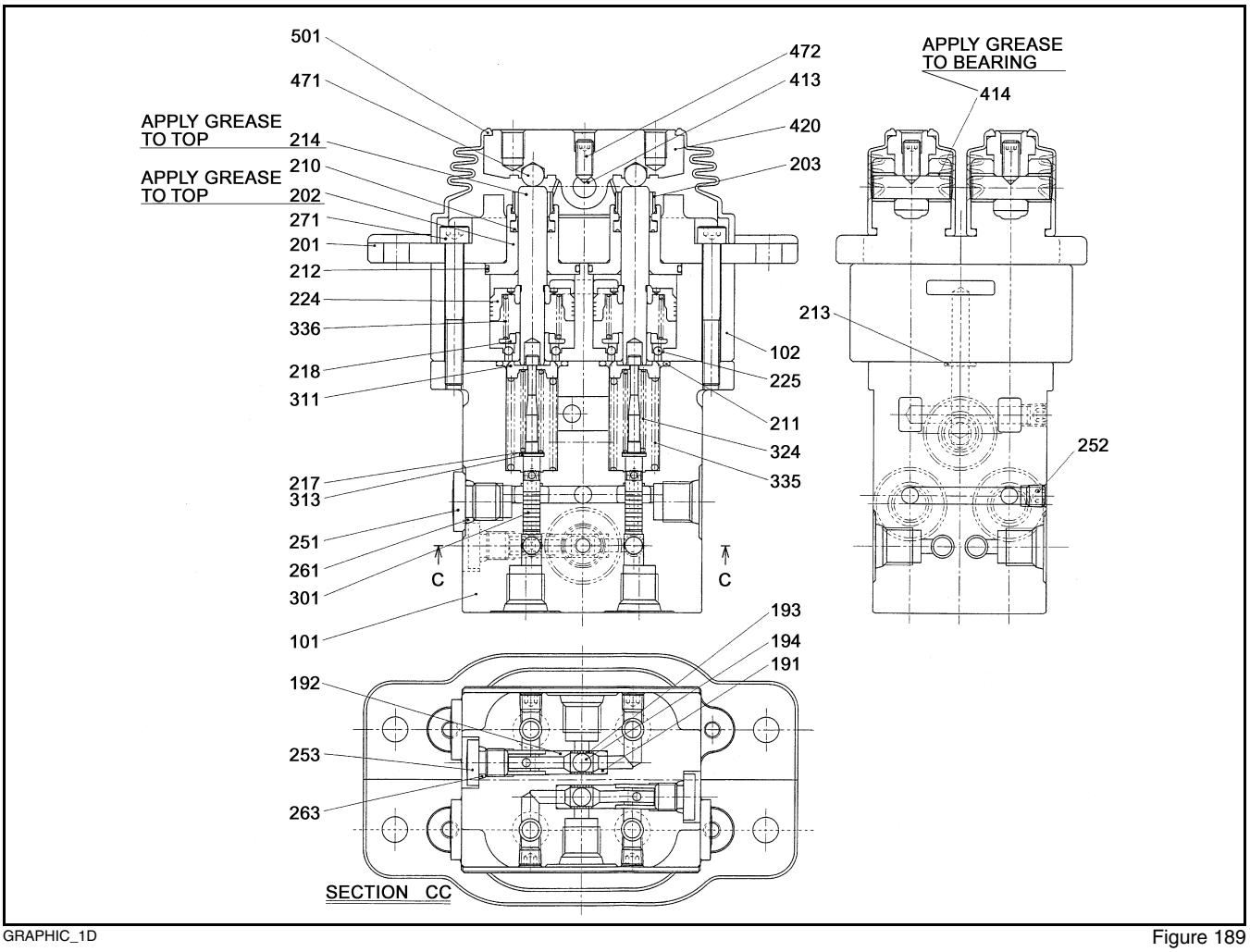
WARNING: *When the force of return springs (221) is strong, never loosen joint (301). If loosened, it might result in jumping out of plate (151), plug (211) and push rod (212).*
Remove joint (301) pressing plate (151) downward with two fingers.



GRAPHIC_ID Figure 170

PILOT VALVE (TRAVEL)

Construction

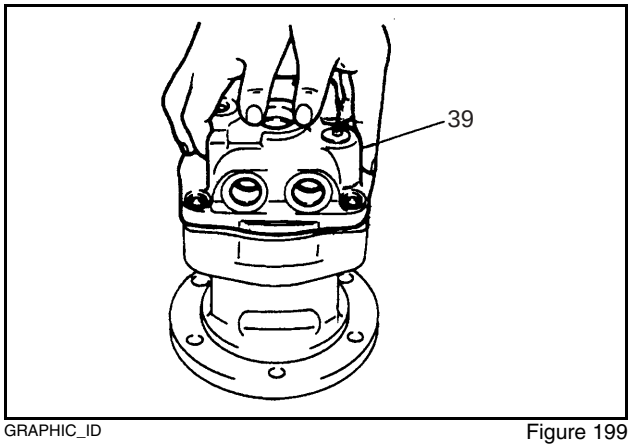


GRAPHIC_1D

Figure 189

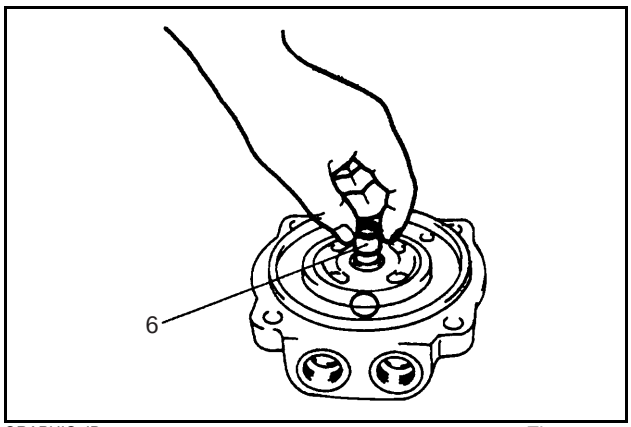
Torque Nm (pound-ft)	No.	Name	Qty	Torque Nm (pound-ft)	No.	Name	Qty
	101	CASING	1	29.4 (22)	251	RO PLUG	3
	102	CASING (DAMPER)	1	6.9 (5.1)	252	PLUG	6
	191	SEAT 1	2		253	RO PLUG	2
	192	SEAT 2	2		261	O-RING	3
	193	BUSHING 2	2		263	O-RING	2
	194	STEEL BALL	2	8.8 (6.5)	271	SOCKET BOLT	4
	201	COVER	2		301	SPOOL	4
	202	PLUG	4		311	SPRING SEAT	4
	203	GREASE CUP	4		313	WASHER	4
	210	PACKING	4		324	SPRING	4
	211	O-RING	4		335	SPRING	4
	212	O-RING	4		336	SPRING	4
	213	O-RING	2		413	CAM SHAFT	2
	214	PUSH ROD	4		414	BUSHING	4
	217	SHIM	4		420	CAM	2
	218	SPRING SEAT	4		471	STEEL BALL	4
	224	PISTON	4	6.9 (5.1)	472	SET SCREW	2
	225	STEEL BALL	12		501	BELLOWS (BOOTS)	2

5. Lift up and remove cover (39).



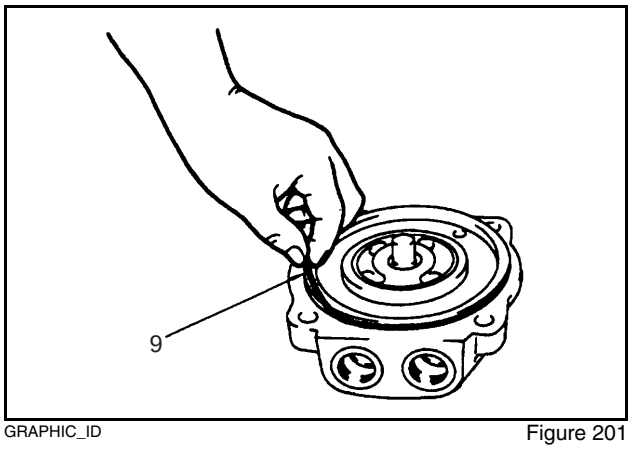
GRAPHIC_ID Figure 199

6. Remove snap ring (5) with plier.
7. Remove inner race of needle bearing (6).



GRAPHIC_ID Figure 200

8. Remove the O-ring (9).



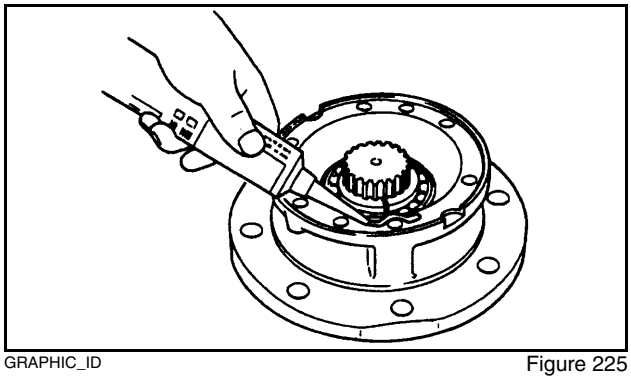
GRAPHIC_ID Figure 201

6. Installing the ring gear (10).

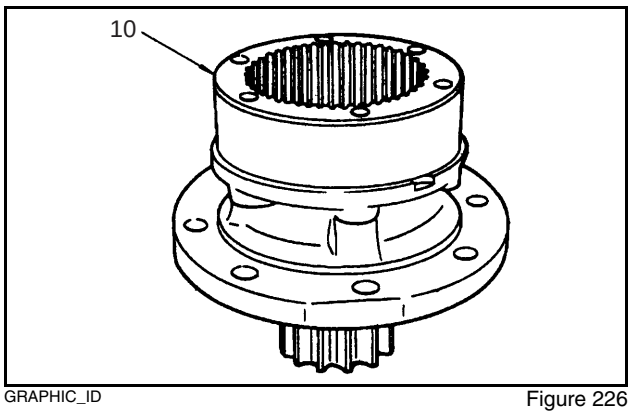
   Degrease the mating surface between the gear case (5) and the ring gear (10) and the pin (9).

   Apply liquid packing (Three Bond #1215, gray) to the area of the gear case (5) inside the bolt circle, and install the ring gear (10) on the gear case (5).

   Apply sealant equally so that the thickness projecting from nozzle is about 1.5 mm (0.06 in) in diameter.



GRAPHIC_ID Figure 225

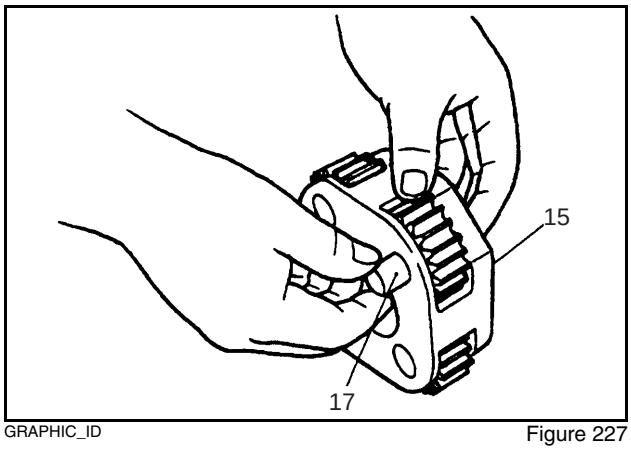


GRAPHIC_ID Figure 226

7. Installing the holder 2 assy (15)

   A. Install the needle bearing (16) in spur gear 5 (18). Install this assy together with the thrust plate 2 (19) into holder 2 (21), and insert the shaft 2 (17) into the spur gear.

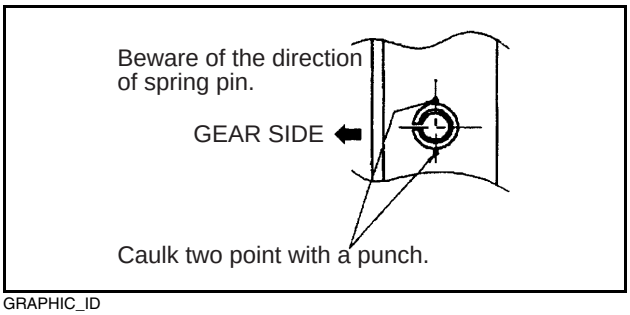
      Apply hydraulic oil to the inside diameter of spur gear 5 (18), needle bearing (16) and the outside diameter of the shaft 2 (17).



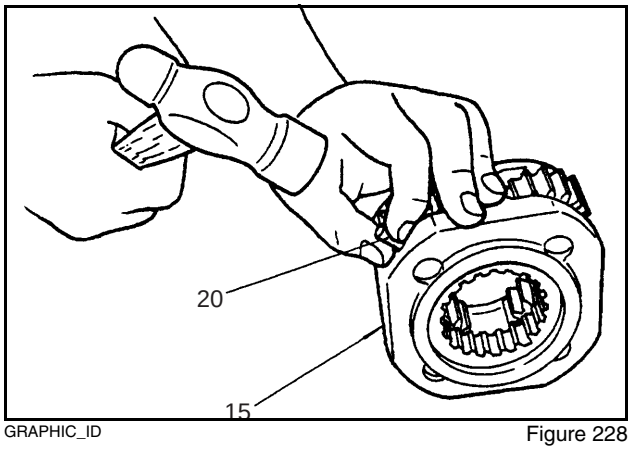
GRAPHIC_ID Figure 227

   B. Drive the spring pin (20)

   NOTE: *Drive spring pin facing the split to gear side.*



GRAPHIC_ID



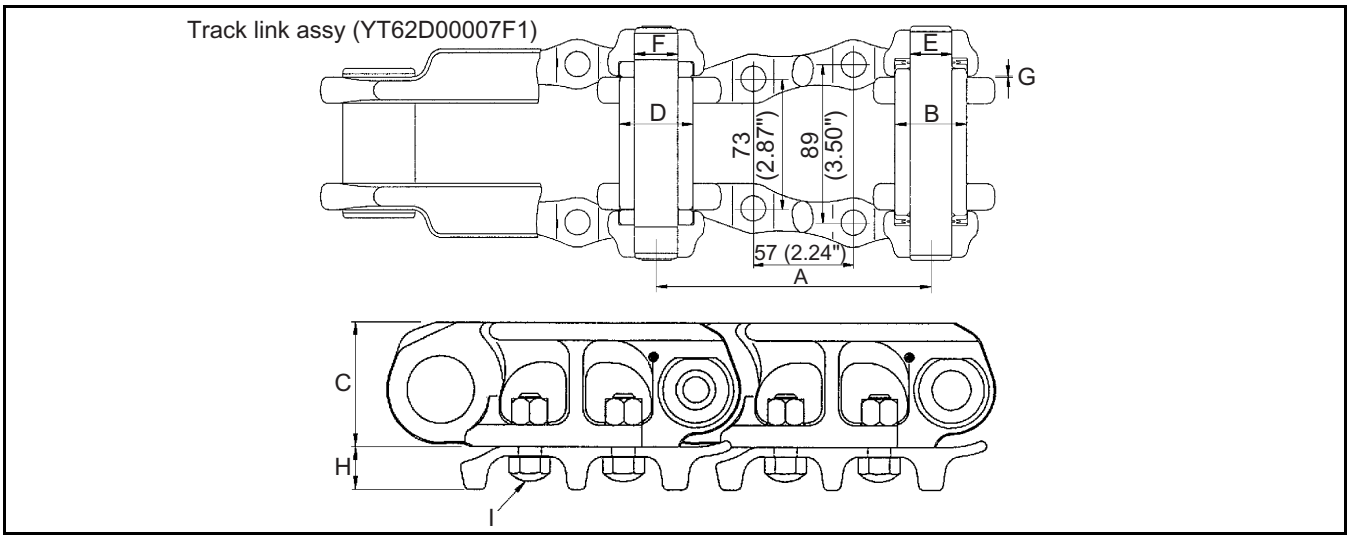
GRAPHIC_ID Figure 228

Troubleshooting

Table 3

Trouble	Cause	Remedy
1. External leakage of hydraulic oil	Defective O-ring	Replace all seals.
2. Internal leakage of hydraulic oil	1) Defective slipper seal	1) Replace all seals.
	2) Sliding face worn excessively	2) Replace assy.
3. Swivel joint seized	1) Stem and body seized	1) Grind and hone. Replace assy, if stem and body are too loose and causing oil leakage.
	2) Setting failure of swivel stopper bracket	2) Reinstall Secure 2~3 mm (0.08~0.12 in) allowance for bolt stopper.
4. Loose swivel stem and cover	Socket bolt tightened insufficiently.	Retighten to specified torque.

Maintenance Standard



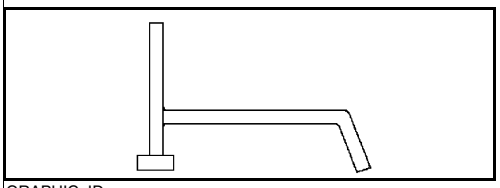
GRAPHIC_1D

Figure 11

Unit : mm (in)

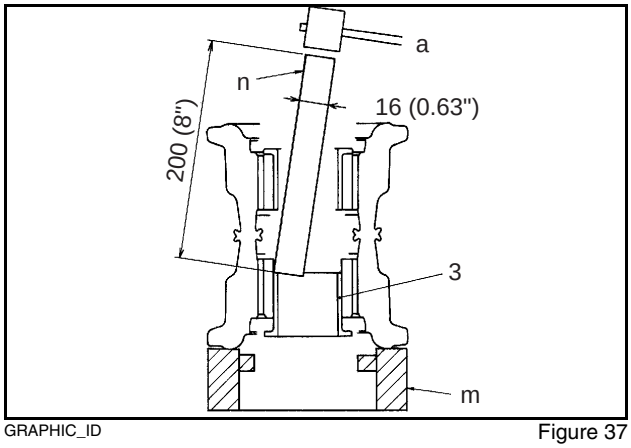
No.	ITEM	STANDARD VALUE			REPAIRABLE LEVEL	SERVICE LIMIT	REMEDY
A	Link pitch	155.6±0.1(6.126±0.0039)			160 (6.30)	164 (6.46)	Replace the link assy if the service limit is exceeded.
B	O.D. of bushing	Ø41 $^{+0.214}_{+0.174}$ (1.6142 $^{+0.0084}_{+0.0069}$)			Ø37 (1.46)	Ø36 (1.42)	
C	Height of link	75±0.15 (2.9528±0.0059)			69 (2.72)	67 (2.64)	
D	Interference between bushing and link	Basic dimension	Tolerance		Fit	Fit	Replace
		Ø41 (1.6142)	Shaft	+0.214 (+0.0084) +0.174 (+0.0069)	Interference 0.05 (0.0020)	Interference 0	
E	Interference between track pin and link	Ø24 (0.9449)	Shaft	+0.15 (+0.008) 0 (0)	Interference 0.05 (0.0020)	Interference 0	
F	Interference between master pin and link	Ø24 (0.9449)	Shaft	-0.05 (-0.0020) -0.08 (-0.0032)	Interference 0.05 (0.0020)	Interference 0	Replace Link
G	Clearance between links (both sides)	1.6 (0.06)			8 (0.32)	10 (0.39)	Replace
H	STD shoe plate	26 (1.02)			15 (0.59)	13 (0.51)	Replace
I	Tightening torque of shoe bolt	294 Nm (220 pound-ft)					Retighten

Tools and Jigs

No.	JIGS	SHAPE
a	Master pin fixing jig	 GRAPHIC_ID

8. Removing bushing (3)
   Since thickness of bushing (3) is thin, remove it through lathe or strip it with care not damage inner hole of roller. When the wear of bushing is not large, place upper roller (1) on jig (m) for repair stand and apply the end of push-out jig on the end face of bushing (3) end, and push it out striking it with mallet.

NOTE: *Hammer the inside surface of roller lightly so as not to damage the surface. Put the extrusion jig (n) uniformly over the circumference of bushing (3) and extrude it little by little.*



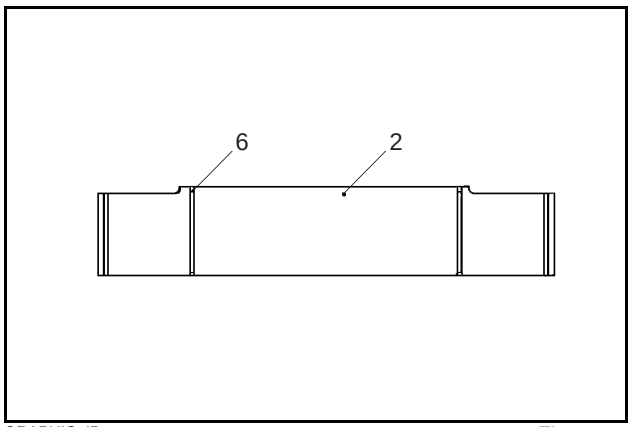
GRAPHIC_ID
Figure 37

Installing

1. Attach O-ring (6) to one side
   Install O-ring (6) to shaft groove.

   Apply grease to O-ring.

   Replace O-ring with new one.

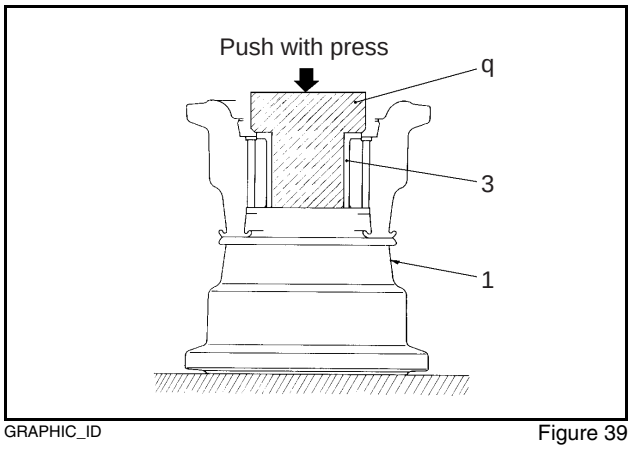


GRAPHIC_ID
Figure 38

2. Press fitting bushing (3)
   Align inner hole of roller (1) and bushing (3) and press fit it vertically in capacity of press fit load, 3600kg (7940 lbs), in the condition that bushing push-in jig (g) is inserted into bushing (3).

   Apply molybdenum disulfide grease on press-fit section of bushing, and press-fit it in ordinary temperature.

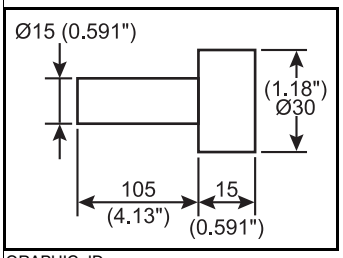
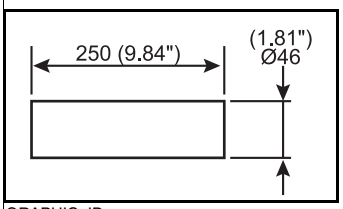
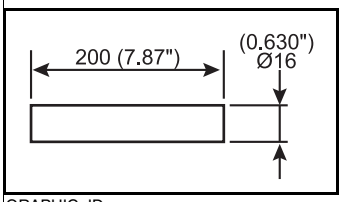
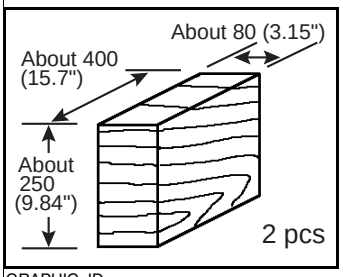
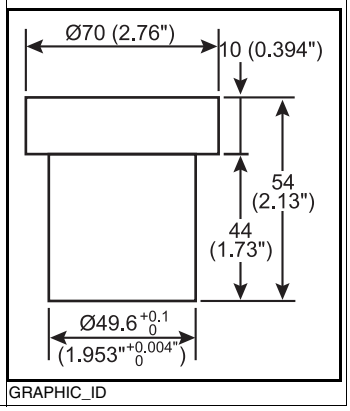
   Bushing which fails to press-fit because of the one-side pressing should not be fitted.



GRAPHIC_ID
Figure 39

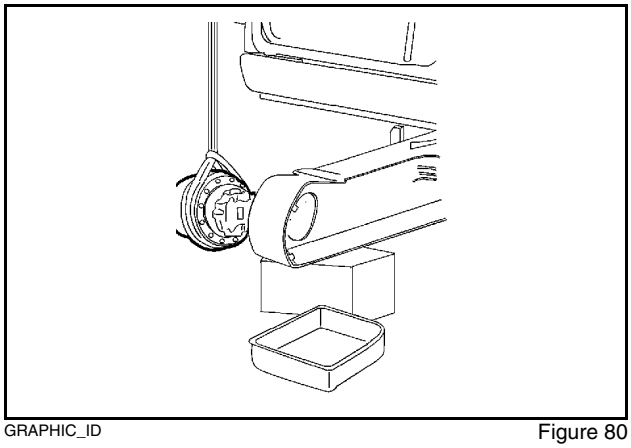
Tools and Jigs

Unit : mm (in)

No.	JIGS	SHAPE
R	Pin striking jig	 GRAPHIC_ID
S	Shaft push out jig	 GRAPHIC_ID
T	Bushing drawing rod	 GRAPHIC_ID
U	Repair stand	 GRAPHIC_ID
V	Bushing Press fitting jig	 GRAPHIC_ID

7. Slinging travel motor assy
   Sling travel motor with nylon sling applied on the the side close to sprocket installing section and remove the motor.

   Weight of motor Approx. 90 kg (198 lbs)



GRAPHIC_ID Figure 80

Installing

Installing of the travel motor piping is performed in the reverse order of removal.

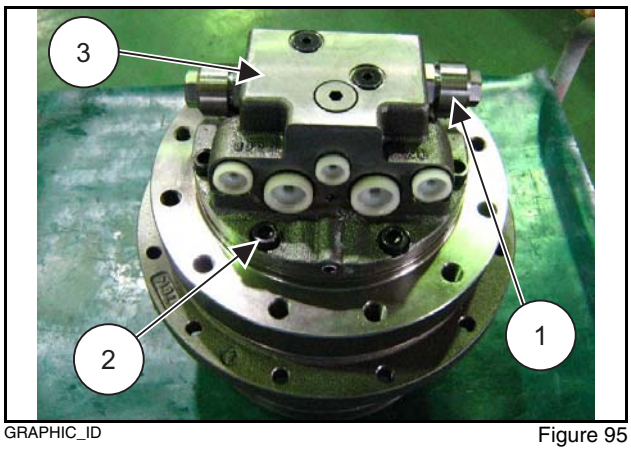
1. Cleaning
   Check that contact surface of travel motor and track frame is free from burr and stain.
2. Tightening torque
   Tighten capscrew and hydraulic pipes to the specified torque.
3. Fill inside from motor drain port to cashing with hydraulic oil before piping for drain. When starting operation, operate motor in low idling and at low speed for several minutes, and check it for possible oil leakage and noise.

Parts	Size	Tools	No.	Tightening Torque Nm(pound-ft)	Remarks
Capscrew	M14	22	3	181 (134)	Apply loctite #262
	M16	24	2	279 (210)	Apply loctite #262
Flareless nut for pipes, sleeve	Ø10 X 1.5	19	—	49 (36)	
	Ø15 X 2.0	27	—	118 (87)	
	Ø18 X 2.5	32	—	147 (110)	
Connector	PF1/4	19	PP	36.3 (27)	
	PF3/8	22	T1,T2	73.6 (54)	
	PF1/2	27	P1,P2	108 (80)	

Disassembly

1. Clean the outside surface of travel unit prior to disassembly. Be sure to attach the parts to the original positions.
   For this purpose, we strongly recommend to record the original positions of parts before and during disassembling.

2. Remove the drain plug and drain lubricating oil. The travel unit oil capacity is 1.35L. Place the travel unit on flat and clean ground.



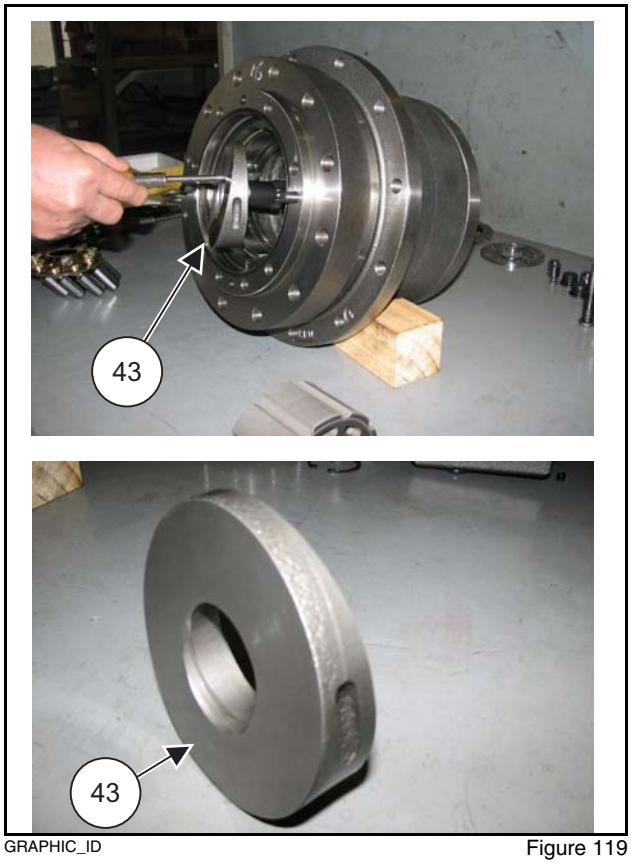
GRAPHIC_ID Figure 95

3. Remove the relief valves (1) on both sides.

NOTE: *Remove the relief valve (1) first, and the removal of 8 bolts (2) and the motor cover (3) becomes easier.*

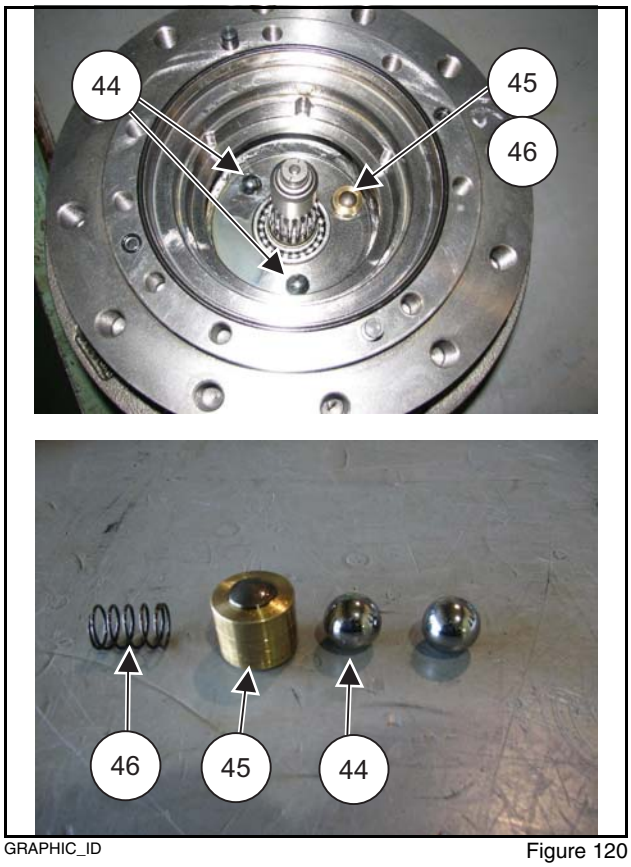
GRAPHIC_ID Figure 96

27. Remove the cam (43) from the body casing.



GRAPHIC_ID Figure 119

28. Remove the 2 steel balls (44) and piston (45) from the body casing. And remove the spring (46) which is located under the piston.

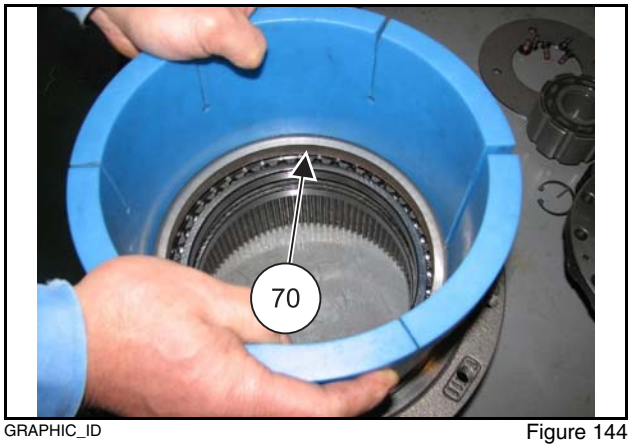


GRAPHIC_ID Figure 120

8. Using the "Jig for floating seal fitting", install the other floating seal (70) in the body casing. Apply SAE30 engine oil or gear oil 80W-90 to the contact surface (flat surface) of the seal ring (metal).

IMPORTANT: *Clean and dry O-ring (rubber) and seal ring (metal) before attaching the floating seal.*
Apply SAE30 engine oil or gear oil 80W-90 to the contact surface of the seal ring.

When joining 2 parts, use caution to prevent damage like scratch and so on to the floating seal.



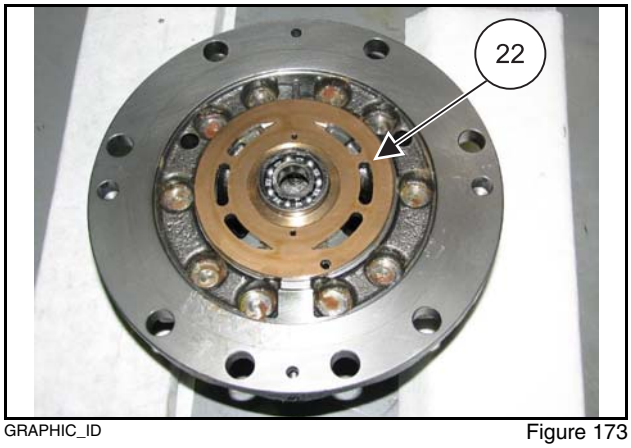
GRAPHIC_ID Figure 144

9. Lift the gear casing (50) on the body casing (73) by means of a crane as shown in the figure. Install the gear casing to the body casing (73).

NOTE: *With the ring gear placed on the body casing, there is a space left between them. This space is not a problem because it is caused by the action of a floating seal. This space is eliminated by attaching ring nut (68).*

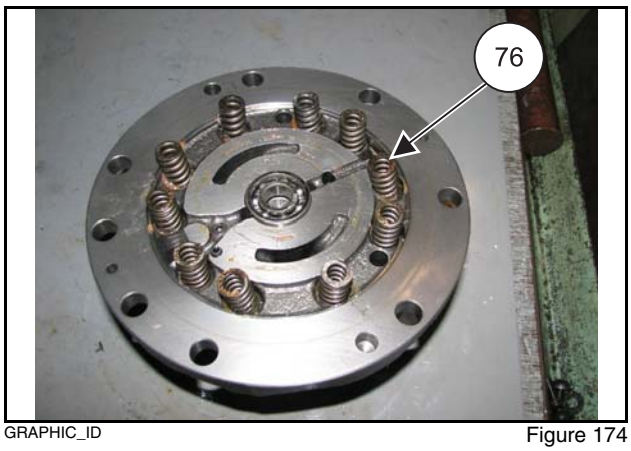
GRAPHIC_ID Figure 145

37. Turn the motor cover over. Install the valve plate (22) in the original position.
Apply the appropriate amount of hydraulic oil to the surface of the valve.



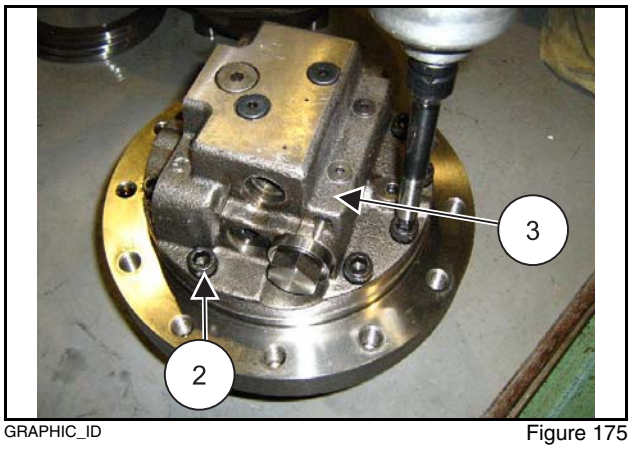
GRAPHIC_ID Figure 173

38. Apply grease to the 10 holes of the motor cover. Install the springs (76) into the holes.
To prevent the springs (76) from falling from holes, the grease was applied.



GRAPHIC_ID Figure 174

39. Place the motor cover (3) on the body casing. Check if the springs (76) are not fallen.
Tighten 8 bolts (2) to install the motor cover.
Tighten the bolts (2) to the specified torque 129.4Nm (95.4 pound-ft).



GRAPHIC_ID Figure 175

CNH America LLC reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

All data given in this publication is subject to production variations. Dimensions and weights are only approximate. Illustrations do not necessarily show products in standard condition. For exact information about any particular product, please consult your Dealer

Revision History				
Issue	Issue Date	Applicable Machines	Form Number	Remarks
First Edition	07-2008	E80B	5-15150	

Table 7

Error code		B012		
Trouble		Boom up pressure sensor outputs error		
Judging condition		After starter switch ON and engine does not start yet. And the input voltage from the sensor after starter switch ON is in the range of 1.4V or more to less than 4.7V.		
Symptom		In case that auto acceleration is turned ON, even when control lever was shifted to neutral, engine speed does not slow down.		
Control in the event of failure		Normal control		
Returned in normal condition		Not returned automatically under normal condition. Switch the power OFF once and turns on it again.		
Service diagnosis checking screen		Screen No.	5	B-1 BOOM RAISE
		Screen No.		
		Screen No.		
Checking object				Checking contents and remedy
1	• Boom up pressure sensor SE-3			When B012 is cancelled and other error occurs by turning starter switch on after exchanging the connector with other sensor. Check sensor unit for possible failure. If failure found, replace it.
2	• Wiring between boom up pressure sensor and controller CN-126F CN-101F			When B012 is displayed after turning the starter switch on after the connector is exchanged with other sensor. Check wiring for possible failure according to the wiring checking procedure and repair it if necessary.
3	• Mechatro controller			Check that the error is corrected after replacement of controller.

Table 8

Error code		B013		
Trouble		Boom up pressure sensor's wiring disconnects.		
Judging condition		The input voltage from boom up pressure sensor is less than 0.1V.		
Symptom		In case that auto acceleration is turned ON, even when control lever was shifted, engine speed does not rise.		
Control in the event of failure		Normal control		
Returned in normal condition		It returns automatically in normal condition.		
Service diagnosis checking screen		Screen No.	5	B-1 BOOM RAISE
		Screen No.		
		Screen No.		
Checking object				Checking contents and remedy
1	• Boom up pressure sensor SE-3			When B013 is cancelled and other error occurs after exchanging the connector with other sensor. Check sensor unit for possible failure. If failure found, replace it.
2	• Wiring between boom up pressure sensor and controller CN-126F CN-101F			When B013 is displayed after the connector is exchanged with other sensor. Check wiring for possible failure according to the wiring checking procedure and repair it if necessary.
3	• Mechatro controller			Check that the error is corrected after replacement of controller.

Table 27

Error code	B074		
Trouble	Swing pressure sensor's power source is shortcut.		
Judging condition	The input voltage from swing pressure sensor is 4.7V or more.		
Symptom	All operation speed slows down.		
Control in the event of failure	Set proportional valve output rate of P1 and P2 pumps to constant current. (Current value in all operation is neutral.) Set output of P1 unload proportional valve to 0mA. (Valve emergency mode)		
Returned in normal condition	It returns automatically in normal condition.		
Service diagnosis checking screen	Screen No.	6	B-7 SWING
	Screen No.		
	Screen No.		
Checking object			Checking contents and remedy
1	Swing pressure sensor SE-5		When B074 is cancelled and other error occurs by turning starter switch on after exchanging the connector with other sensor. Check sensor unit for possible failure. If failure found, replace it.
2	Wiring between swing pressure sensor and controller CN-126F CN-103F		When B074 is displayed after turning the starter switch on after the connector is exchanged with other sensor. Check wiring for possible failure according to the wiring checking procedure and repair it if necessary.
3	Mechatro controller		Check that the error is corrected after replacement of controller.

Table 28

Error code	B082		
Trouble	Swing left pressure sensor outputs error		
Judging condition	After starter switch ON and engine does not start yet. And the input voltage from the swing left pressure sensor after starter switch ON is in the range of 1.4V or more to less than 4.7V.		
Symptom	Swing parking brake does not work.		
Control in the event of failure	Swing parking solenoid valve is changed to non-excitation.		
Returned in normal condition	Not returned automatically under normal condition. Switch the power OFF once and turns on it again.		
Service diagnosis checking screen	Screen No.	6	B-7 SWING (Higher Pressure is selected between swing left and right, and the higher one is indicated.)
	Screen No.		
	Screen No.		
Checking object			Checking contents and remedy
1	Swing left pressure sensor SE-41		When B082 is cancelled and other error occurs by turning starter switch on after exchanging the connector with other sensor. Check sensor unit for possible failure. If failure found, replace it.
2	Wiring between swing left pressure sensor and controller CN-127F CN-101F		When B082 is displayed after turning the starter switch on after the connector is exchanged with other sensor. Check wiring for possible failure according to the wiring checking procedure and repair it if necessary.
3	Mechatro controller		Check that the error is corrected after replacement of controller.

Table 47

Error code		H081		
Trouble		Grounding of coolant temperature sensor is short-circuited.		
Judging condition		The input voltage from coolant temperature sensor is 0.1V or less.		
Symptom		The water temperature is fixed to 20 °C.		
Control in the event of failure		Normal control		
Returned in normal condition		It returns automatically in normal condition.		
Service diagnosis checking screen		Screen No.	2	G-5 The lower side of water temperature meter on gauge cluster is fixed.
		Screen No.		
		Screen No.		
Checking object				Checking contents and remedy
1	• Coolant temperature sensor SE-14			Measure the resistance between terminals. 20 °C 10 Ω~ 878 Ω
2	• Wiring between coolant temperature sensor and controller F-4 CN-104			Check wiring for possible failure according to the wiring checking procedure and repair it if necessary.
3	• Mechatro controller			Check that the error is corrected after replacement of controller.

Table 48

Error code		H091		
Trouble		Fuel sensor grounding is short-circuited.		
Judging condition		The input voltage from fuel sensor is 0.1V or less.		
Symptom		Warning for low fuel level is indicated.		
Control in the event of failure		Fuel level becomes 0%.		
Returned in normal condition		It returns automatically in normal condition.		
Service diagnosis checking screen		Screen No.	10	H-9 FUEL LEVEL
		Screen No.		
		Screen No.		
Checking object				Checking contents and remedy
1	• Fuel sensor potentiometer SE-15			Move fuel sensor and measure the resistance between terminals of fuel sensor. EMPTY 95Ω ~ FULL 5Ω
2	• Wiring between fuel sensor and controller CN-152F CN-104F			Check wiring for possible failure according to the wiring checking procedure and repair it if necessary.
3	• Mechatro controller			Check that the error is corrected after replacement of controller.

CNH America LLC reserves the right to make improvements in design or changes in specifications at any time without incurring any obligation to install them on units previously sold.

All data given in this publication is subject to production variations. Dimensions and weights are only approximate. Illustrations do not necessarily show products in standard condition. For exact information about any particular product, please consult your Dealer

Revision History				
Issue	Issue Date	Applicable Machines	Form Number	Remarks
First Edition	07-2008	E80B	5-15160	

10. Bucket digging is slow

No.	Sections	Contents/normal value		Corrective action, others
1	Bucket digging pressure sensor	Carry out service diagnosis	•See Service Diagnosis Data List Operation No.12 bucket digging full lever and relief	Check and replace pressure sensor Check remote control valve
2	Pilot proportional secondary pressure	Measure directly remote control pressure of bucket digging (b port)	Check that pressure is 3.0MPa or more in bucket digging full lever and high idling operation	Check remote control valve When equipped with multi control valve, check it while changing lever pattern
3	Remote control valve	Check targeted remote control valve	Check that spool is free from abnormal damage and Spring is free from breakage.	Replace
4	Main relief valve <Trouble> Relief pressure is low.	Check set pressure of pump from Pd1 port	Operation : Boom up full lever and relief 26MPa or more	Replace
5	Bucket spool <Trouble> Pump pressure is high.	Visual check	When removing, free from abnormal resistance against sliding. Free from abnormal damage on outside of spool Spring is free from breakage.	Replace (Check on the casing for damage)
6	Over load relief valve	Check targeted spool visually	Free from dust entered in over load relief valve. Seat is free from abnormality.	Replace
7	Check valve for bucket recirculation	Visual check	Free from abnormal resistance against sliding. Spring is free from breakage.	Replace
8	Pressure compensation valve for bucket	Visual check	Free from abnormal resistance against sliding. Spring is free from breakage.	Replace (Check on the casing for damage)

11. Bucket dump is slow

No.	Sections	Contents/normal value		Corrective action, others
1	Bucket dump pressure sensor	Carry out service diagnosis	•See Service Diagnosis Data List Operation No.14 bucket dump full lever and relief	Check and replace pressure sensor Check remote control valve
2	Pilot proportional secondary pressure	Measure directly remote control pressure of bucket dump	Check that pressure is 3.0 MPa or more in bucket dump full lever and high idling operation	Check remote control valve When equipped with multi control valve, check it while changing lever pattern
3	Remote control valve	Check targeted remote control valve	Check that spool is free from abnormal damage and Spring is free from breakage.	Replace
4	Main relief valve <Trouble> Relief pressure is low.	Check set pressure of pump from Pd1 port	Operation : Boom up full lever and relief 26MPa or more	Replace
5	Bucket spool <Trouble> Both P1, P2 pressures are high.	Visual check	When removing, free from abnormal resistance against sliding. Free from abnormal damage on outside of spool Spring is free from breakage.	Replace (Check on the casing for damage)
6	Over load relief valve	Check targeted spool visually	Free from dust entered in over load relief valve. Seat is free from abnormality.	Replace

27. Slow boom swing left

No.	Sections	Contents/normal value		Corrective action, others
1	Boom swing left pressure sensor	Carry out service diagnosis	•See Service Diagnosis Data List Operation No.16 boom swing left full lever and relief	Check and replace pressure sensor Check remote control valve
2	Pilot proportional secondary pressure	Measure directly pilot proportional secondary pressure of boom swing left (a9 port)	Check that pressure is 3.0 MPa or more in boom swing left full lever and high idling operation.	Check remote control valve.
3	Remote control valve	Check targettd remote control valve	Check that spool is free from abnormal damage and spring is free from breakage.	Replace
4	Lock valve poppet <Trouble> Pump pressure is high	Visual check	When removing, free from abnormal resistance against sliding. Free from abnormal damage on outside of poppet.	Replace (Check on the casing for damage)
5	Relief pressure	Check set pressure	Operation : Relief pressure is 26.0 MPa or more at boom swing left full lever	Reset or replace
6	Boom swing spool <Trouble> Pump pressure is high	Visual check	When removing, free from abnormal resistance against sliding. Free from abnormal damage on outside of spool. Spring is free from breakage.	Replace (Check on the casing for damage)
7	Over load relief valve	Check targeted spool visually (ROD side)	Free from dust entered in port relief valve. Seat is free from abnormality	Replace
8	Pressure compensation valve for boom swing	Visual check	When removing, free from abnormal resistance against sliding. Free from abnormal damage on outside of spool. Spring is free from breakage.	Replace (Check on the casing for damage)

NOTES