TO THE READER

- This manual is written for an experienced technician to provide technical information needed to maintain and repair this machine.

  - Be sure to thoroughly read this manual for correct information concerning the service procedures.

  - If you have any questions or comments, or if you found any errors regarding the contents of this manual, please contact:

NEW HOLLAND KOBELCO
CONSTRUCTION MACHINERY S.p.A.
Strada Settimo, 323
San Mauro Torinese (TO)
10099 ITALIA
PRODUCT SUPPORT
Fax. +39 011 0077357

ADDITIONAL REFERENCES

- Please refer to the materials listed below in addition to this service manual:

  - **Operator's Manual**
  - **Service Parts Catalogue**

COMPLETE SERVICE MANUAL

- The Service Manual consists of one volume:
  - E140CSR
    Service Manual for “Crawler Excavators

The Service Manual for “Crawler Excavators” contains the necessary technical information to carry out maintenance and repair operations on the machine, the necessary tools to carry out maintenance operations, the information on service standards, the procedures for removal, installation, disassembly and reassembly.

The Service Manual regarding models E140CSR consists of the following volume, identified by the print number indicated below:

VOLUME	MACHINE TYPE	PRINT NUMBER
Service Manual - “Crawler Excavators”	E140CSR	47381457A

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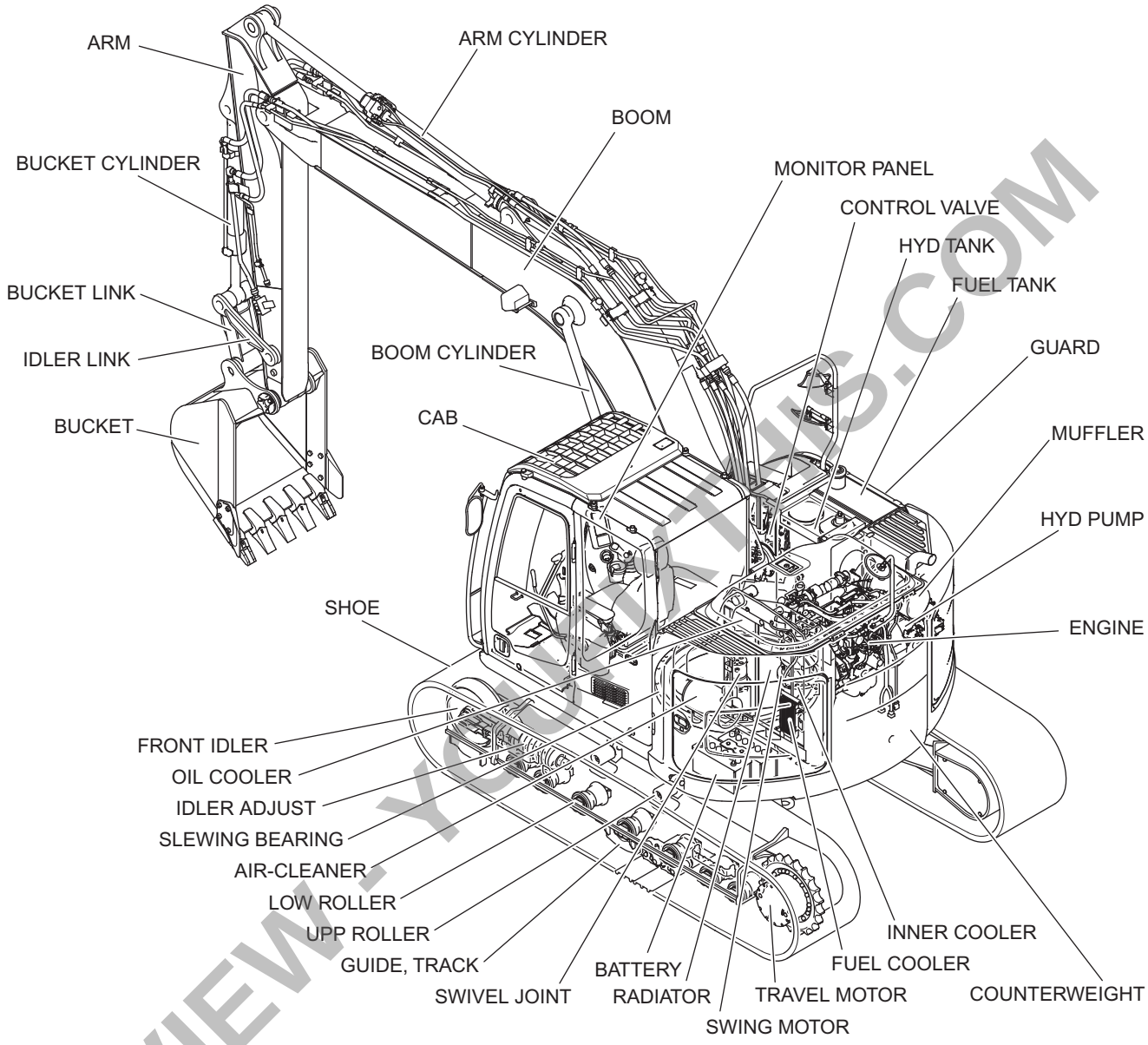
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Issue	Date of Issue	Applicable Machines	Remarks
First Edition	December, 2008	SK200-8 : YN12-56001~ SK210LC-8 : YQ12-08001~	S5YN0129E01 (SE Asia & Oceania)
↑	August, 2010	SK235SRLC-2 : YU06-03001~	↑ (NA)
↑	↑	E225BSR : YB06-03501~ E225BSRLC : LA06-02501~	↑ (NHK-EUR)
↑	↑	SK215SRLC : LA06-02501~	↑ (NA)
↑	September, 2010	E385CLC : YC	↑ (NHK)
↑	↑	SK350LC-9 : YC	↑ (NA)
↑	↑	SK330-8 : LC11-T0101~ SK350LC-8 : YC11-T0101~	↑ TKCM (HS Engine)
↑	↑	SK350LC-8 : YC11-T0101~	↑ (TKCM)
↑	October, 2010	SK80MSR-2 : LF06-04547~	↑ (AUS)
↑	↑	SK70SR-2 : YT06-18444~	↑ (AUS)
↑	↑	SK140SRLC : YH06-08001~	↑ (Latin America)
↑	November, 2010	SK135SR-2 : YY06-15978~ SK135SRLC-2 : YH06-08090~	↑ (AUS)
↑	December, 2010	SK235SR-2 : YF06-02559~ SK235SRLC-2 : YU06-03014~	↑ (ANZ)
↑	↑	SK200-8 : YN12-58781~ SK210LC-8 : YQ12-08501~	↑ (ANZ)
↑	↑	SK210LC-8 : YQ12-B0101~	↑ KCEI
↑	↑	SK250-8 : LQ13-07375~ SK260LC-8 : LL13-06387~	↑ (ANZ)
↑	↑	E485C : YS	↑ (NHK)
↑	↑	SK480LC-9 : YS	↑ (NA)
↑	↑	SK225SR : YB06-03580~ SK225SRLC : LA06-02501~	↑ (ANZ)
↑	January, 2011	SK330-8 : LC11-09068~ SK350LC-8 : YC11-04950~	↑ (ANZ)
↑	September, 2011	SK225SR : YB06-03501~	↑ (SE Asia)
↑	December, 2011	E140CSR : YH07-09001~	↑ (NHK-EUR)
↑	↑	SK140SRLC-3 : YH07-09001~	↑ (NA)

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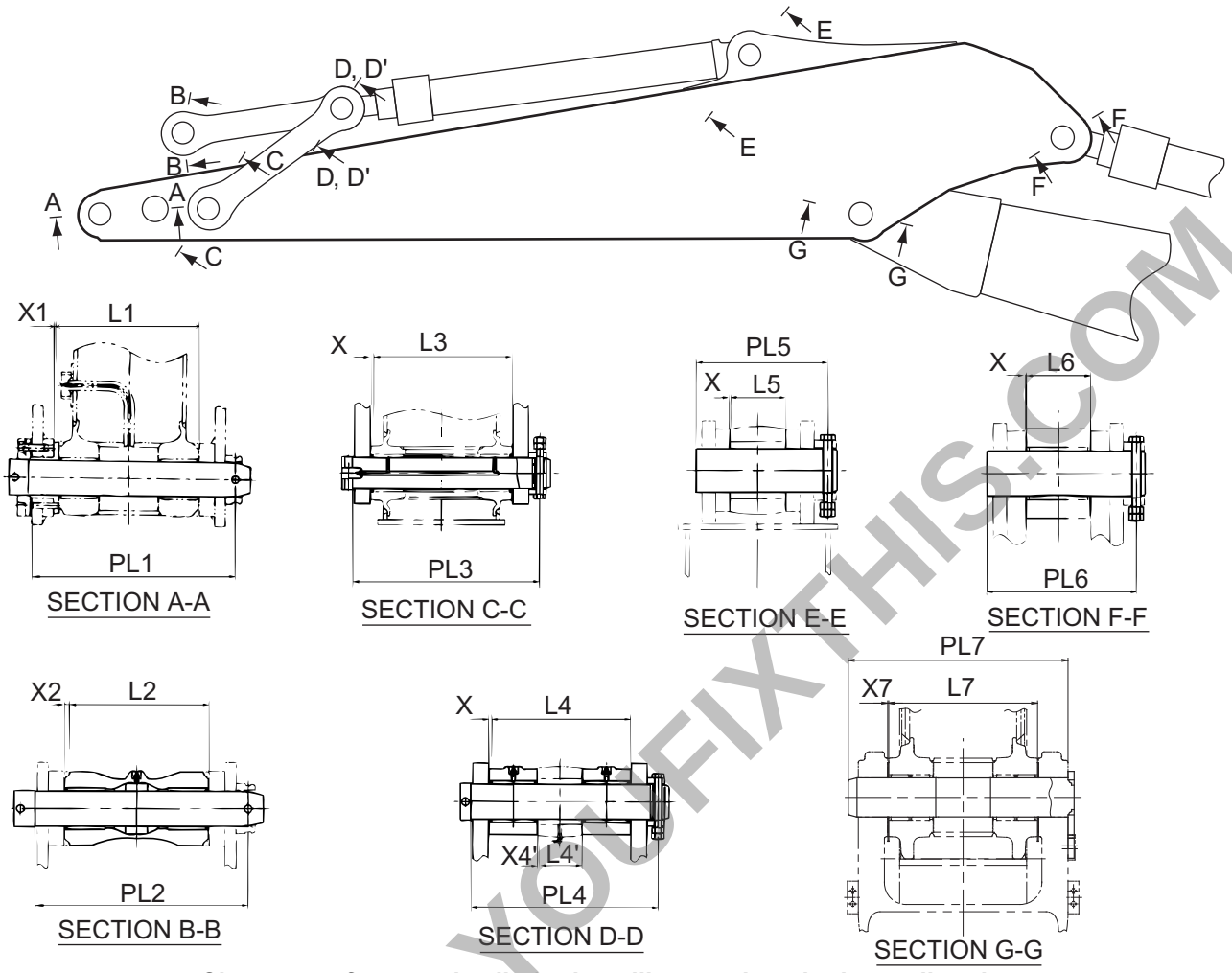
2.1 NAME OF COMPONENTS



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(2) Clearance of arm and cylinder installing sections in thrust direction



Clearance of arm and cylinder installing sections in thrust direction

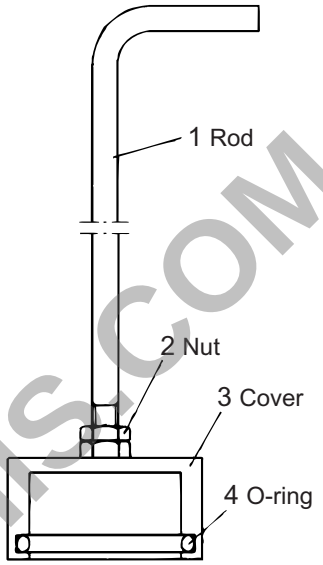
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11.9 SUCTION STOPPER

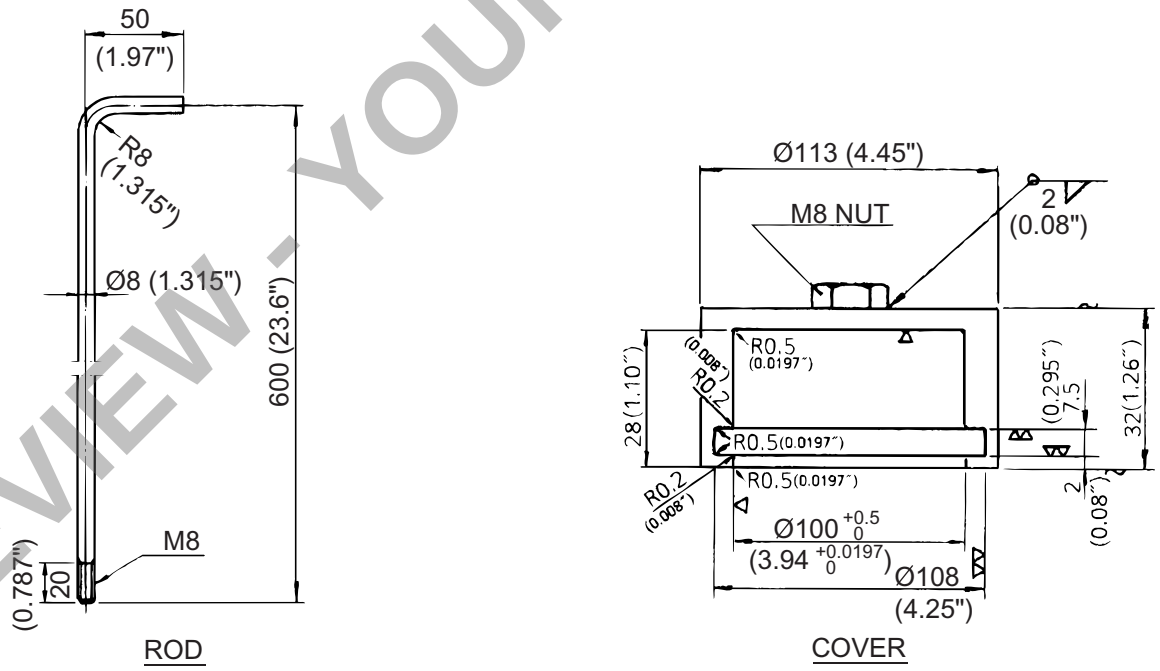
11.9.1 COMPONENTS

No.	NAME	PARTS No.	Q'TY
	SUCTION STOPPER ASSY	24100P978F2	
1	ROD	2420T4660D1	1
2	NUT	ZN16C08007	1
3	COVER	2414T2123D2	1
4	O-RING	45Z91D6	1



Components of suction stopper

11.9.2 DIMENSION



Dimension of suction stopper

11.9.3 APPLICABLE MODEL

Part No. \ Applicable model	E140CSR	SK140SRLC-3
24100P978F2	○	○

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PREFACE

(1) Working Conditions

1. Workers:
   More than one worker shall be 1st class service technician (having five years or more of field experience and having received training in the operation).
2. Equipment:
   Jigs, tools, apparatuses and testers used in field service work shall be available commercially. The maintenance plant shall be equipped with a service shop, a crane and inspection apparatuses necessary for specific self inspection activities.
3. Place:
   A flat land where work may be performed and to which a service car or a truck crane is accessible.

(2) Range of standard maintenance time

1. Standard maintenance time = Direct maintenance time + Preparation time
2. Direct maintenance time: Net time actually spent for maintenance
3. Spare time:
   Time needed to move machines for service, prepare safety operations, discuss work, and process the needs of the body.

(3) Extra time (not included in the standard service time)

1. Repair time:
   Machining, sheet metal, welding, melt cutting, folding and extracting bolts, servicing parts, and painting.
2. Items excluded from service time because of uncertainty in time:
   Receiving a vehicle into shop, transfer, delivery, inspection on completion, investigation of causes of faults, diagnosis, and inspection.
3. Indirect time:
   Time for; field work, preparation of necessary parts before leaving for work, return for field work, waiting time because of user's convenience in the field, paper work after returning to shop, and preparation of bills.
4. Special time: Work at early morning, at midnight and on holidays are to be calculated separately.
5. Separate calculation: The operating time for service cars, trucks with a crane and crane trucks.

(4) Applicable machine for estimation of standard maintenance time

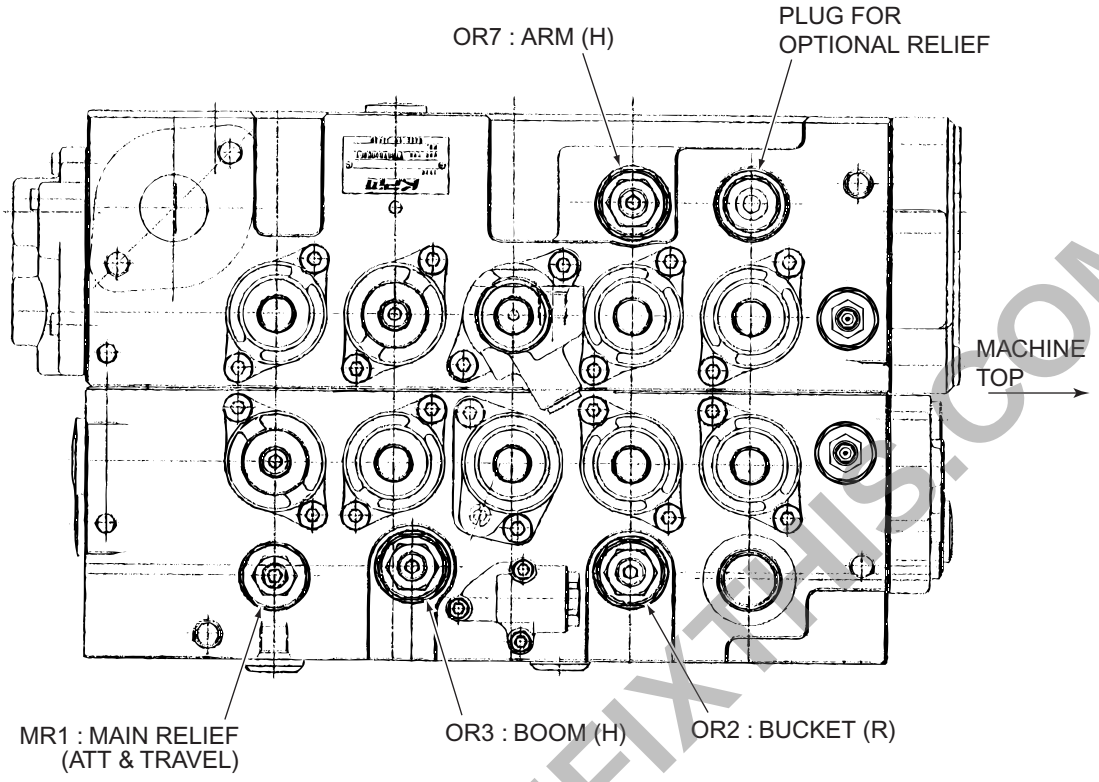
1. Standard machine
2. A well maintained and controlled machine with a standard combination of attachments which is used in a general environment.

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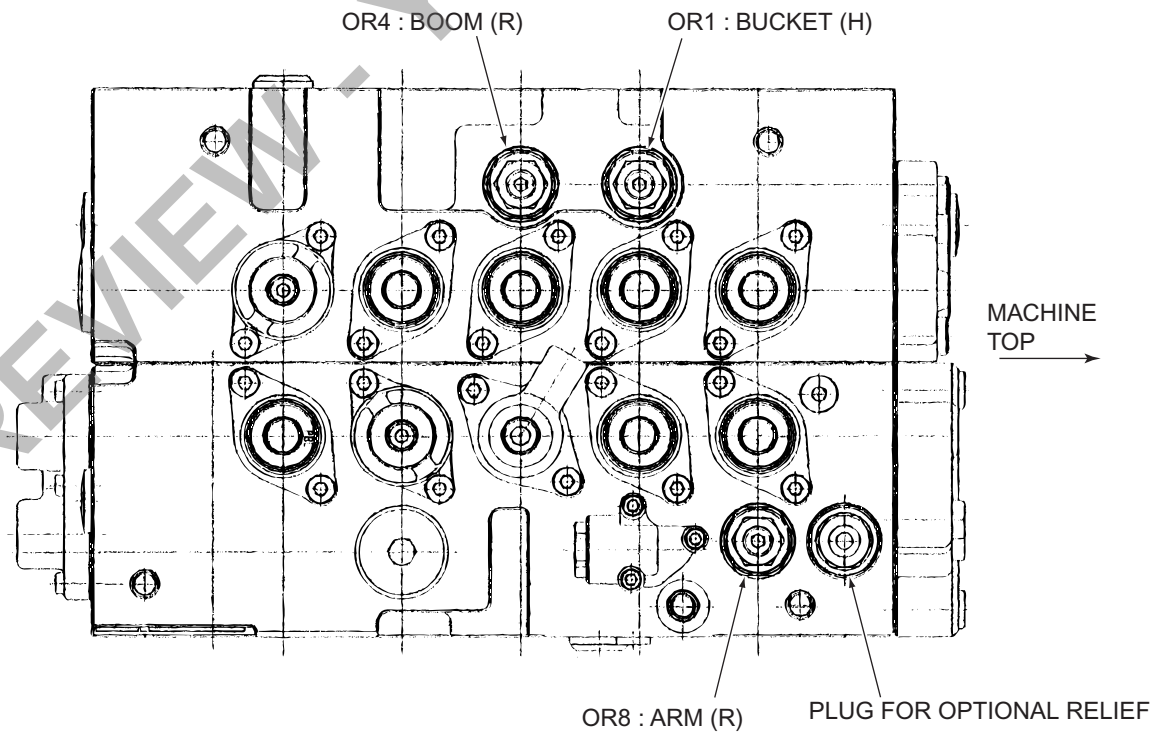
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13.4.3 PRESSURE ADJUSTMENT POSITION

(1) Main control valve



VIEW FROM RIGHT FRONT OF MACHINE



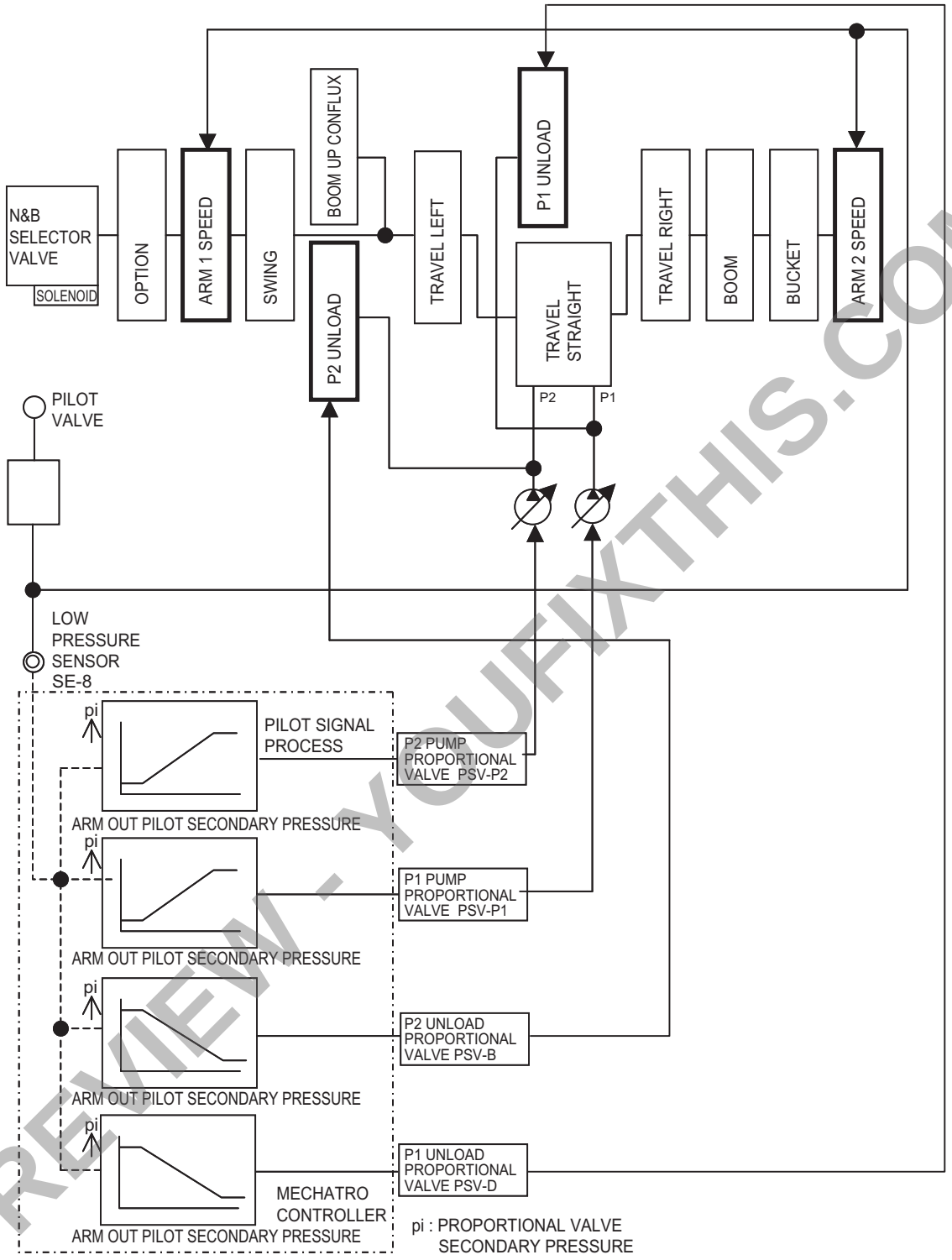
VIEW FROM LEFT REAR OF MACHINE

Relief valve position on main control valve

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21.1.7 ARM-OUT CONFLUX CONTROL



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22. HYDRAULIC SYSTEM

TABLE OF CONTENTS

22.1 SUMMARY 22-3
22.2 HYDRAULIC CIRCUITS AND COMPONENTS 22-4
22.3 COLOR CODING STANDARD FOR HYDRAULIC CIRCUITS 22-8
22.4 NEUTRAL CIRCUIT 22-8
22.5 TRAVEL CIRCUIT 22-10
22.6 BUCKET CIRCUIT 22-12
22.7 BOOM CIRCUIT 22-14
22.8 SWING CIRCUIT 22-18
22.9 ARM CIRCUIT 22-20
22.10 COMBINED CIRCUIT 22-26
22.11 PRESSURE DRAINING (RELEASING) CIRCUIT 22-30

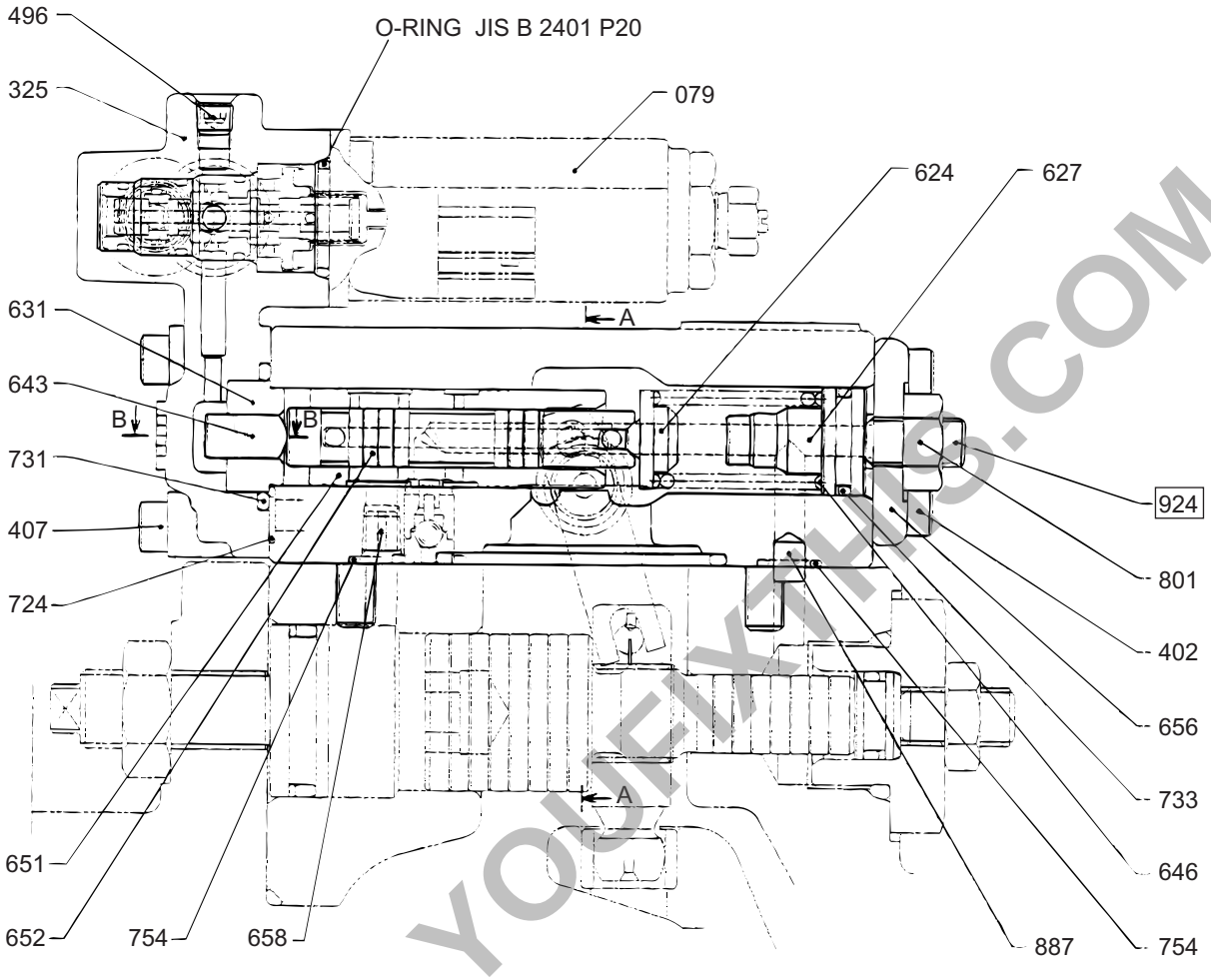
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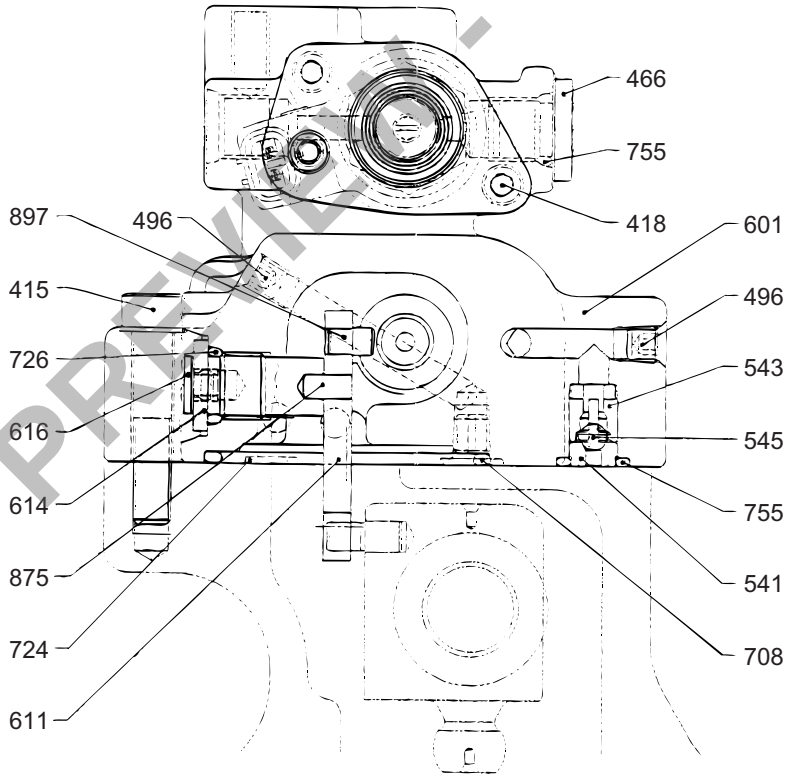
Book Code No. **S5YY2223E01**

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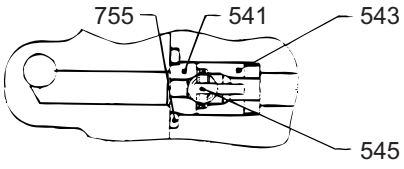
24.1.1.3 REGULATOR

24.1.1.3.1 CONSTRUCTION





SECTION A–A



SECTION B–B

TIGHTENING TORQUE

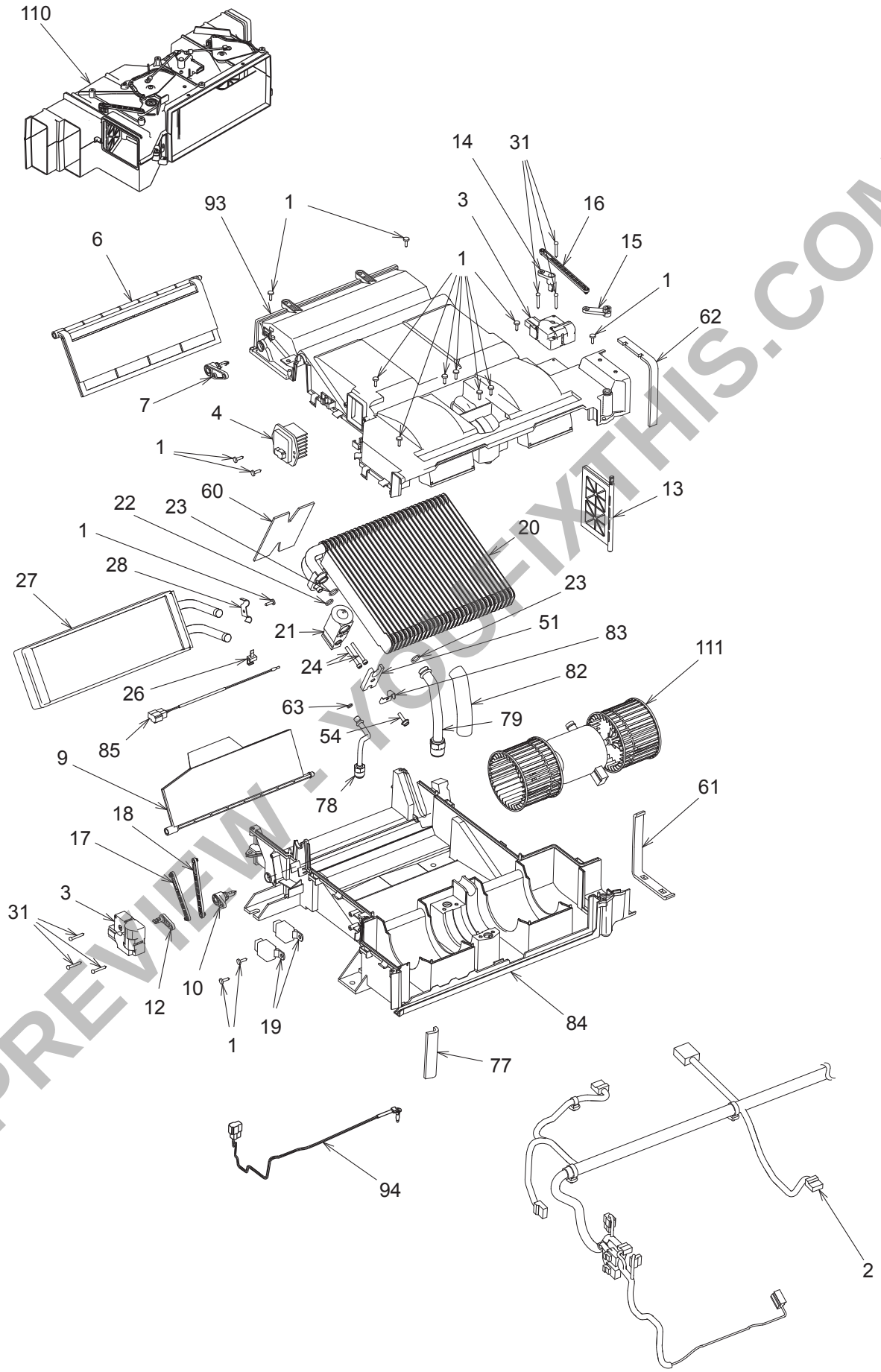
Item No.	Thread size	Tightening torque N·m (lbf·m)
402,407	M6	12 (8.9)
415	M8	29 (21)
418	M5	6.9 (5.1)
466	PF 1/4	16 (12)
496	NPTF1/16	8.8 (6.5)
614	M14 ×1.5	27 (20)
801	M10	29 (21)

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25.2.2 CONSTRUCTION

(1) Air conditioner unit



Air conditioner unit

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Issue	Date of Issue	Applicable Machines	Remarks
First Edition	December, 2008	SK200-8 : YN12-56001~ SK210LC-8 : YQ12-08001~	S5YN3129E01 (SE Asia & Oceania)
↑	August, 2010	SK235SRLC-2 : YU06-03001~	↑ (NA)
↑	↑	E225BSR : YB06-03501~ E225BSRLC : LA06-02501~	↑ (NHK-EUR)
↑	↑	SK215SRLC : LA06-02501~	↑ (NA)
↑	September, 2010	E385CLC : YC	↑ (NHK)
↑	↑	SK350LC-9 : YC	↑ (NA)
↑	↑	SK330-8 : LC11-T0101~ SK350LC-8 : YC11-T0101~	↑ TKCM (HS Engine)
↑	↑	SK350LC-8 : YC11-T0101~	↑ (TKCM)
↑	October, 2010	SK80MSR-2 : LF06-04547~	↑ (AUS)
↑	↑	SK70SR-2 : YT06-18444~	↑ (AUS)
↑	↑	SK140SRLC : YH06-08001~	↑ (Latin America)
↑	November, 2010	SK135SR-2 : YY06-15978~ SK135SRLC-2 : YH06-08090~	↑ (AUS)
↑	December, 2010	SK235SR-2 : YF06-02559~ SK235SRLC-2 : YU06-03014~	↑ (ANZ)
↑	↑	SK200-8 : YN12-58781~ SK210LC-8 : YQ12-08501~	↑ (ANZ)
↑	↑	SK210LC-8 : YQ12-B0101~	↑ KCEI
↑	↑	SK250-8 : LQ13-07375~ SK260LC-8 : LL13-06387~	↑ (ANZ)
↑	↑	E485C : YS	↑ (NHK)
↑	↑	SK480LC-9 : YS	↑ (NA)
↑	↑	SK225SR : YB06-03580~ SK225SRLC : LA06-02501~	↑ (ANZ)
↑	January, 2011	SK330-8 : LC11-09068~ SK350LC-8 : YC11-04950~	↑ (ANZ)
↑	September, 2011	SK225SR : YB06-03501~	↑ (SE Asia)
↑	December, 2011	E140CSR : YH07-09001~	↑ (NHK-EUR)
↑	↑	SK140SRLC-3 : YH07-09001~	↑ (NA)

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32. ATTACHMENTS

Issue	Date of Issue	Applicable Machines	Remarks
First Edition	December, 2011	E140CSR : YH07-09001~	S5YY3223E01 (NHK-EUR)

PREFACE

(1) This Manual describes all the procedures from removing to attaching, arranging them by item.
(2) This Manual consists of 2 sections. "Removing and Installing", and "Disassembling and Assembling".
(3) The removing and installing can be performed in the procedure specified in Table of Contents, but in view of actual repairing or time saving some process can be omitted.
(4) The removing and installing procedure does not completely cover all possible situations because of differences of field condition and defective section.
(5) Please be aware that the procedure to be followed must be determined according to the above conditions. When disassembly and assembly are required, select the necessary section, itemize the work contents with good understanding, then starts working.

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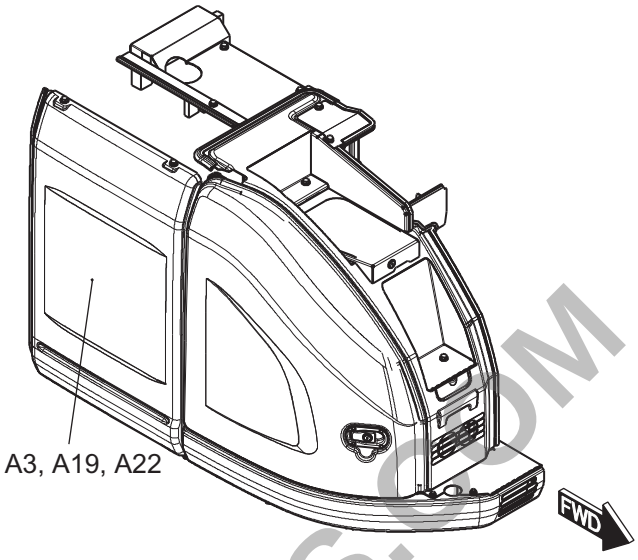
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(10)Remove fuel tank side panel assy (A3)

1. Remove 2 sems bolts (A22) M12X40.
2. Remove 2 sems bolts (A19) M12X20.
3. Remove panel assy (A3).

Weight : 8.7kg (19 lbs)

Tools: Socket: 19mm



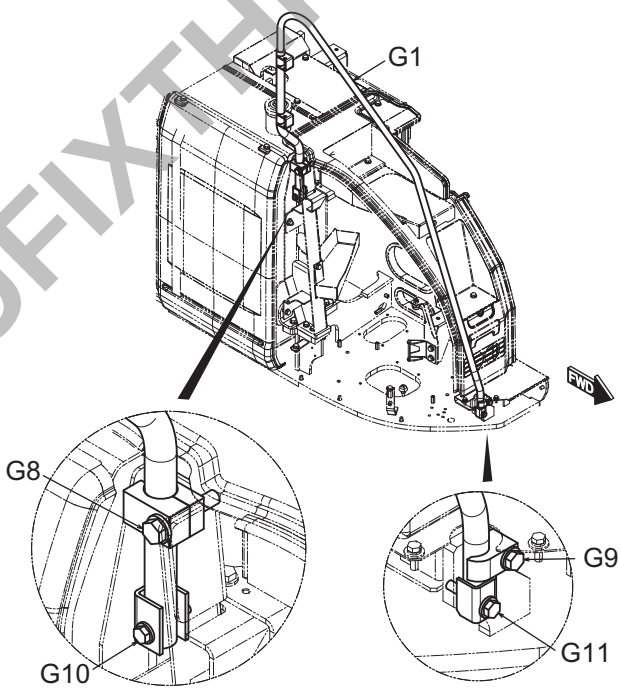
Removing panel assy (A3)

(11)Remove stay (G1)

1. Remove 4 capscrews (G8) M16X85, (G9) M12X60, (G10) M10X65 and (G11) M10X60.
2. Remove stay (G1).

Weight : 10kg (22 lbs)

Tools: Socket: 17mm, 19mm, 24mm

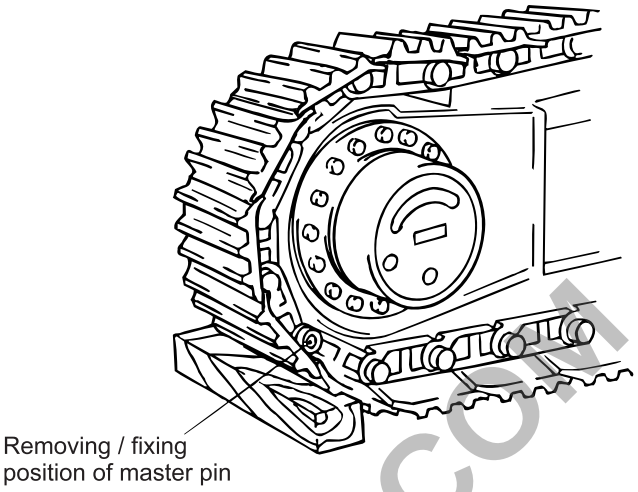


Removing stay (G1)

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3. Pushing out master pin
   Apply jig on master pin and strike it out with a mallet.
   (Refer to Fig. "Press fitting of master pin")

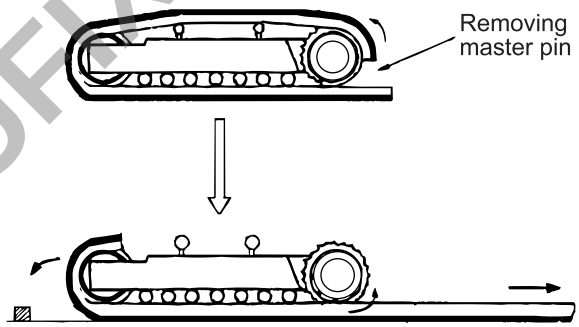


Removing/fixing position of master pin

CAUTION

When using a big hammer, wear protective goggles and a long-sleeved uniform so you do not injure yourself by flying objects.

(4) Removing crawler
   Put attachment on ground so that weight is not loaded to the lower frame, and remove track link assy rotating sprocket.



Removing crawler

CAUTION

Crawler end section may fall on the ground just before extending it on the ground incurring danger of injury. Please keep well away from the equipment.

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Issue	Data of Issue	Applicable Machines	Remarks
First Edition	September, 2010	E385CLC : YC	S5LC4625E01 NHK
↑	↑	SK350LC-9 : YC	↑ NA
↑	December, 2011	E140CSR : YH07-09001~	↑ (NHK-EUR)
↑	↑	SK140SRLC-3 : YH07-09001~	↑ (NA)

Preface

Troubleshooting provides process locating for the cause of trouble in the order that trouble occurred. This manual describes how to solve the specific phenomenon systematically as early as possible. For troubleshooting concerning the inside of equipment, refer to troubleshooting for each manual of equipment.



Attending the field to verify actual thing.

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47.1 HYDRAULIC SYSTEM

Preface:
The troubleshooting for the failures shown below is explained here.
Identify the failure and trouble and carry forward the troubleshooting in order of the failure item number.

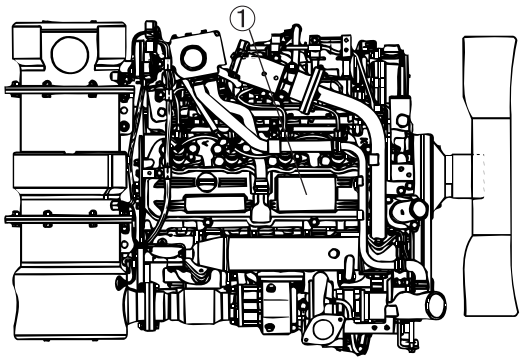
(1) All controls do not function/slow
(2) Engine down/stalled
(3) Move at lever neutral position
(4) Poor fine operability
(5) Slow boom up, insufficient power
(6) Slow boom down, insufficient power for lifting up body
(7) Slow arm in, insufficient power
(8) Slow independent arm out (in the air)
(9) Slow bucket digging
(10) Slow bucket dumping
(11) Swing operation not functioned/slow
(12) Noise during swing operation
(13) Swing on a slope drifts when control lever is in neutral position
(14) Swing drifts when swing operation is stopped
(15) Slow travel speed/weak
(16) Travel deviation
(17) Travel 1st/2nd speed not changed
(18) Travel parking on a slope is not held
(19) Travel does not run straightly when both crawlers and attachment operated simultaneously.
(20) Slow breaker (crusher) operation, weak power
(21) Option selector valve malfunction: not switched to breaker circuit
(22) Option selector valve malfunction: not switched to nibbler circuit

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Issue	Date of Issue	Applicable Machines	Remarks
First Edition	February, 2012	E140CSR : YH07-09001~	S5YY5123E01 (NHK-EUR)
↑	↑	SK140SRLC-3 : YH07-09001~	↑ (NA)

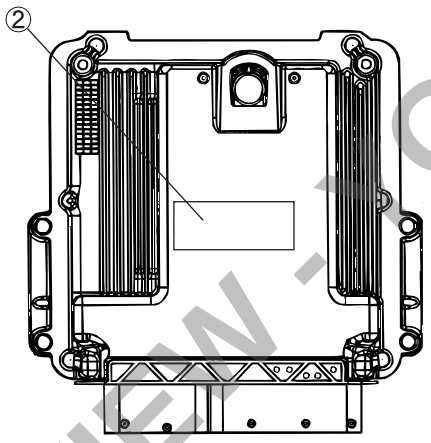
a) Serial No. plate on the top of engine



① Serial No. plate on the top of engine



b) Serial No. plate on the top of engine ECU.



ECU, CONTROLLER

② Serial No. plate on the top of engine ECU

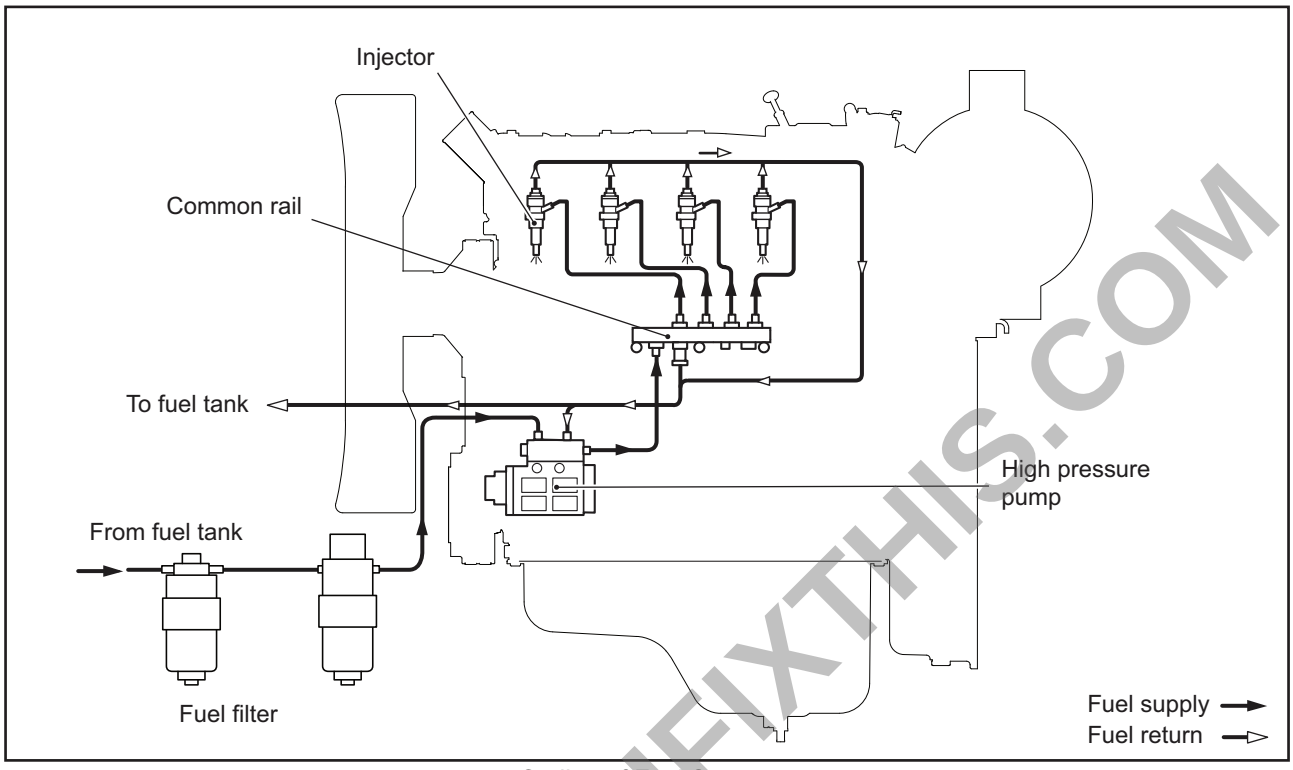


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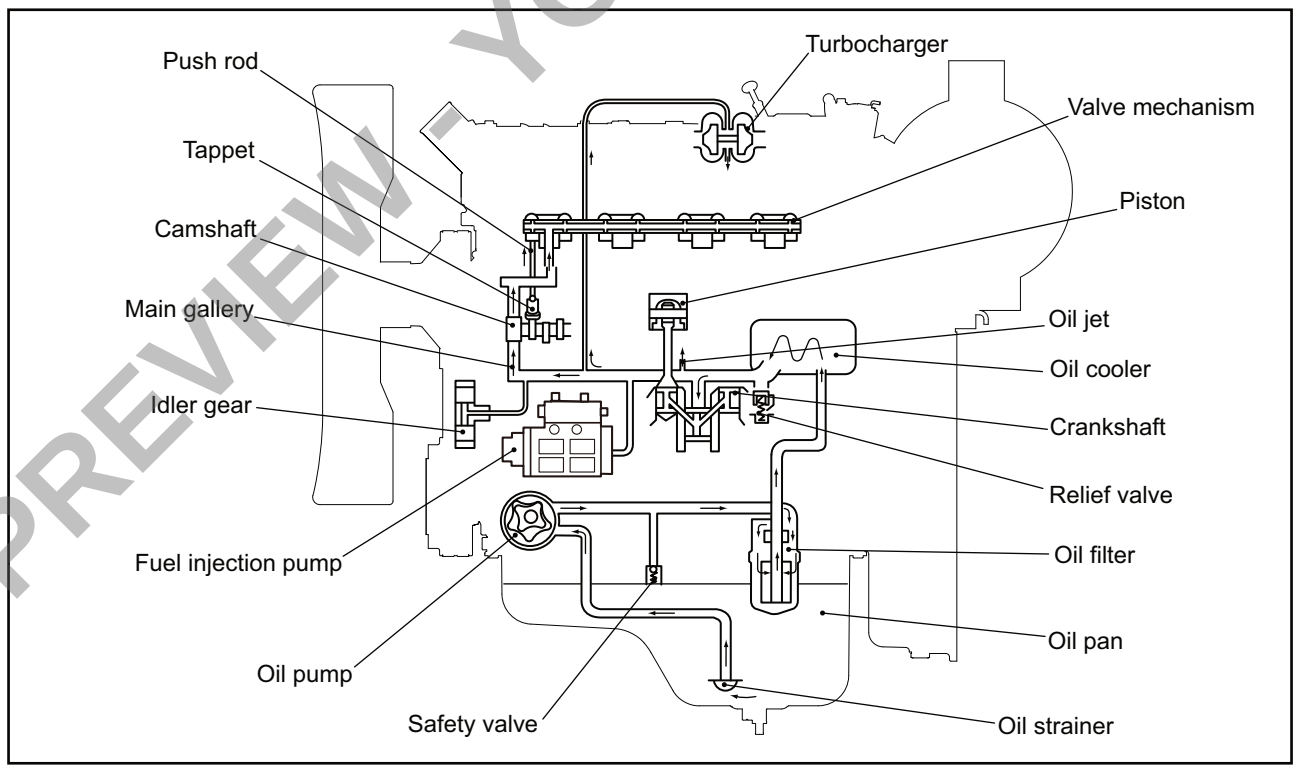
2. Outline of Systems

2.1 Outline of Fuel System



Outline of Fuel System

2.2 Outline of Lubrication System



Outline of Lubrication System

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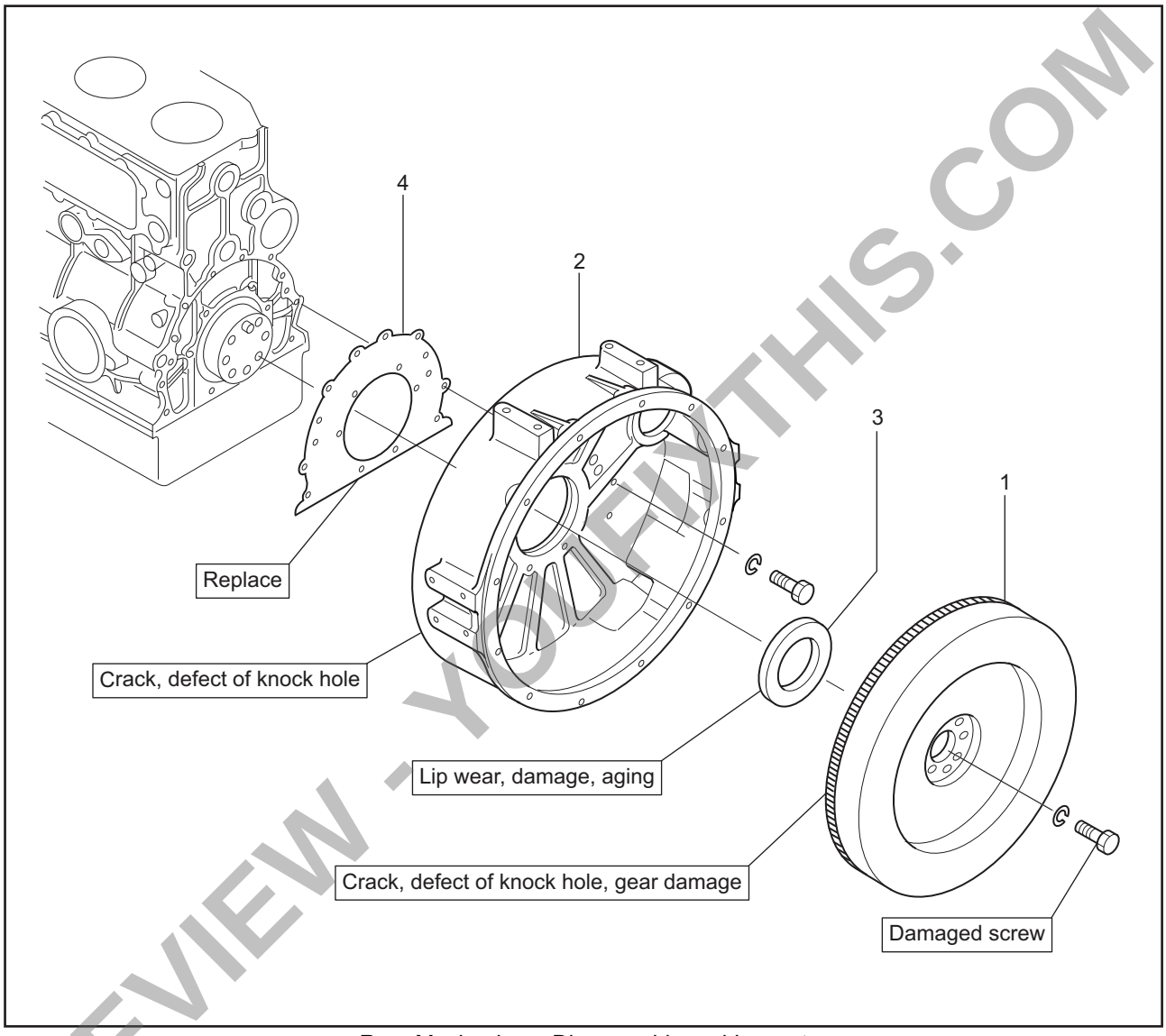
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2. Rear Mechanism - Disassemble and Inspect

Understanding of the current engine condition before disassembling is very important to know the cause of trouble and do the efficient work.

Depending on the maintenance work or purpose, it is desirable to inspect some of the following items before proceeding with any job.

♦Flywheel Face and Radial Runout - Measure



Rear Mechanism - Disassemble and Inspect

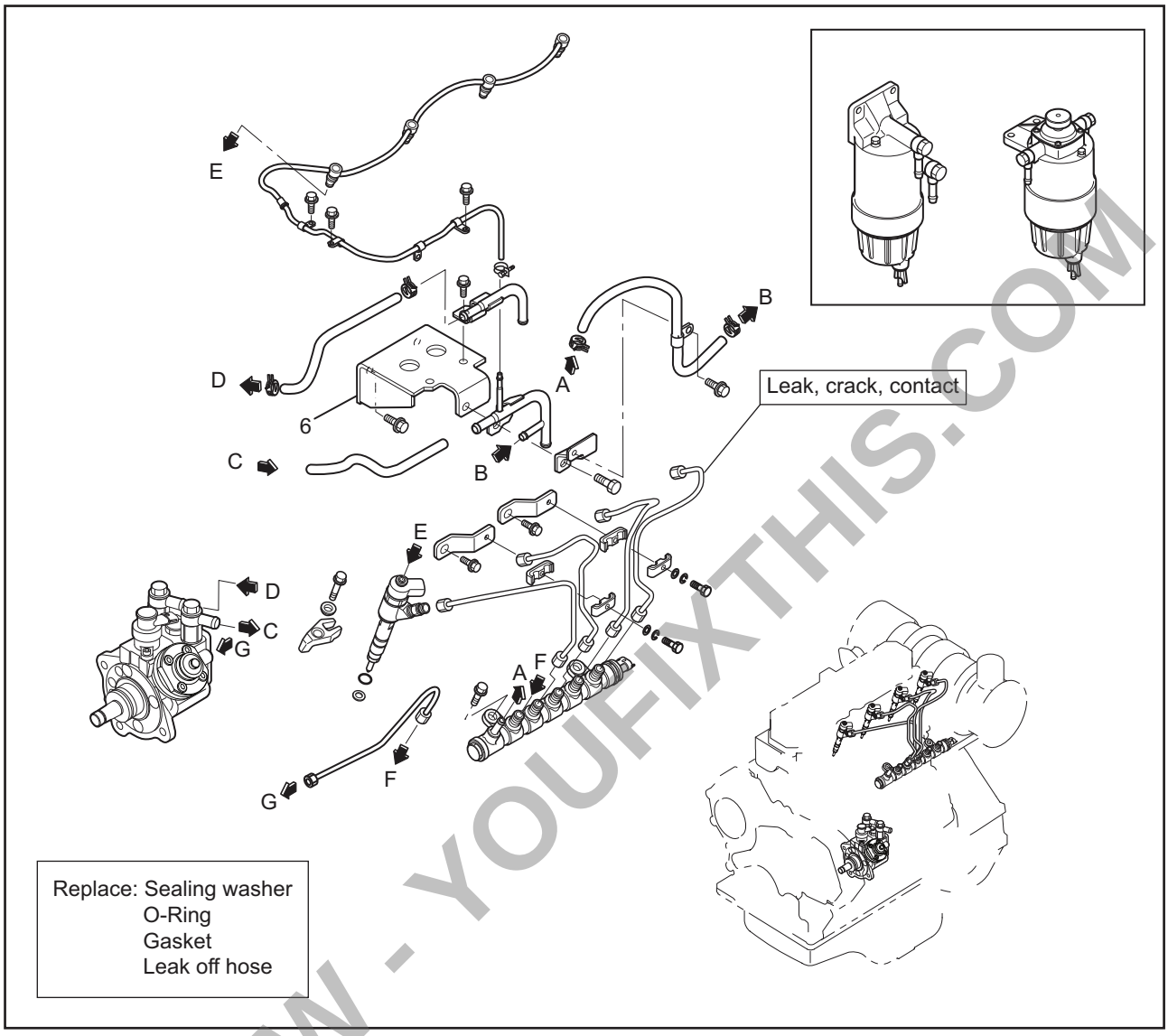
Disassembling sequence

1 Flywheel 2 Flywheel housing 3 Oil seal 4 Packing

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6.2 Fuel System - Install (2)

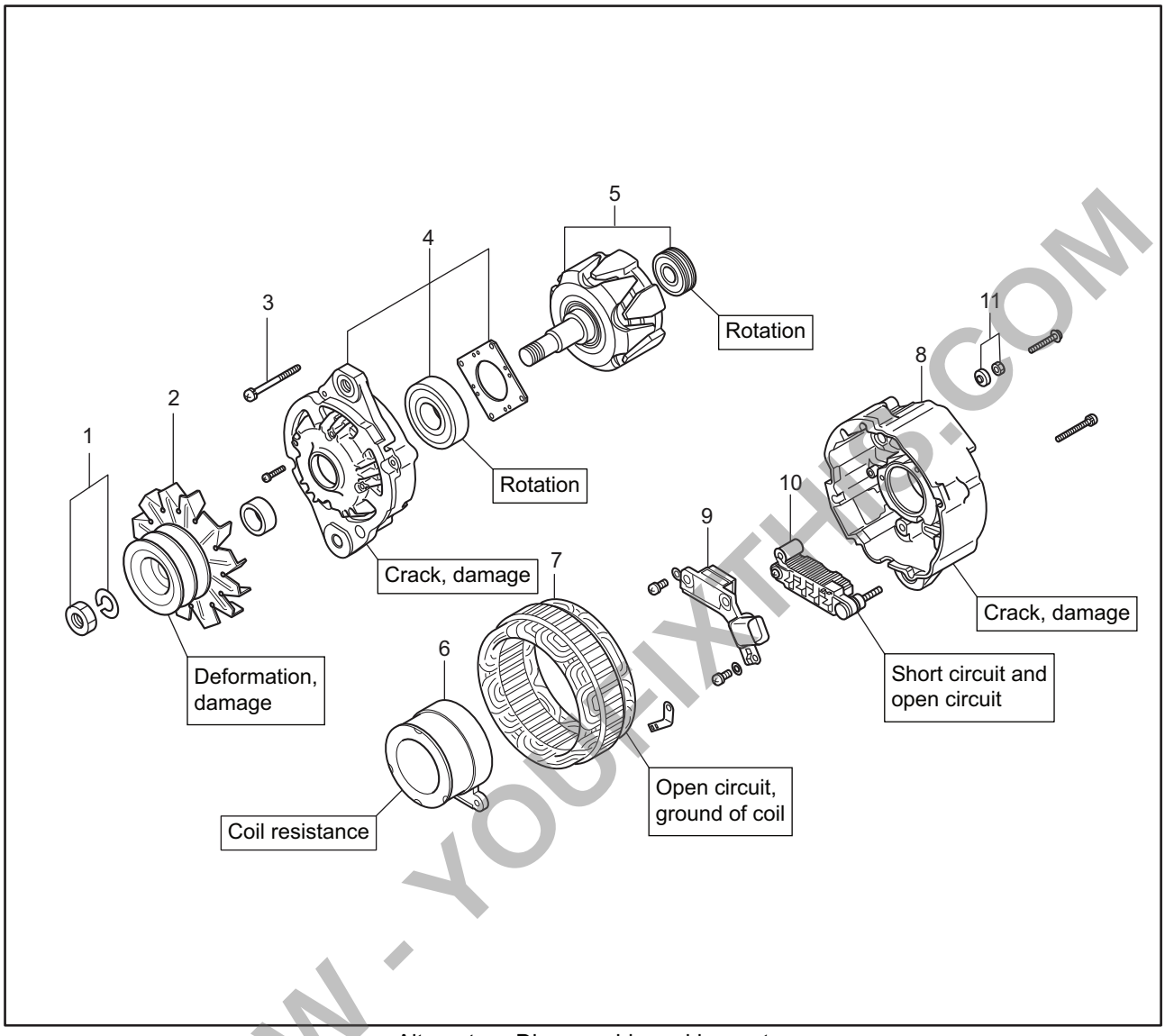


Fuel System - Install (2)

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2.5 Alternator - Disassemble and inspect



Alternator - Disassemble and inspect

Disassembling sequence

1 Nut, washer
2 Pulley (with fan)
3 Screw
4 Front bracket assembly
5 Rotor assembly
6 Coil
7 Stator coil
8 Rear bracket
9 Regulator assembly
10 Rectifier assembly
11 Nut set

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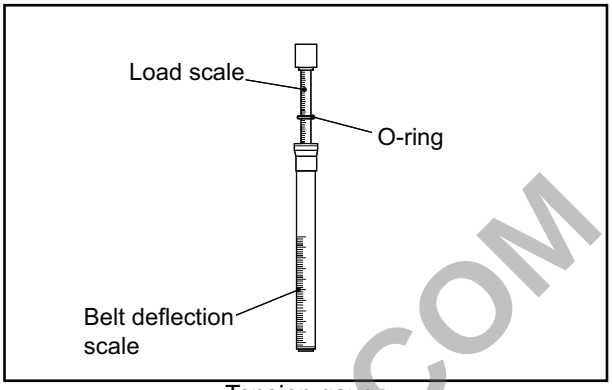
1.4.3 Belt deflection measurement (with tension gauge)

(1) Prepare the tension gauge (P/N: 32591-09100).

(2) Set the O-ring of load scale to the value in the table below.

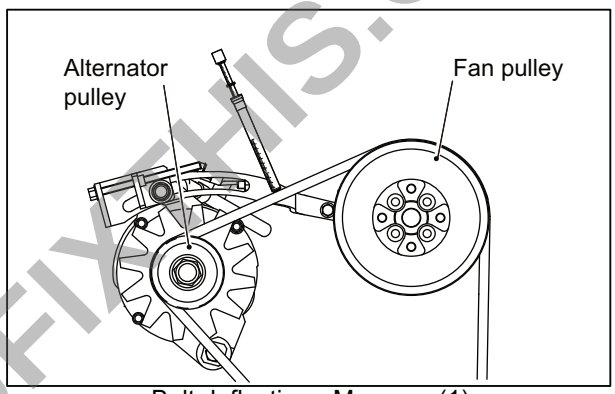
Setting of tension gauge

Item	Set value
Load scale	98 N {10 kgf} [22.03 lbf]



Tension gauge

(3) Set the tip of tension gauge at the middle point between the alternator pulley and water pump pulley as shown in the illustration. Place the tip of tension gauge at the center point of belt width.

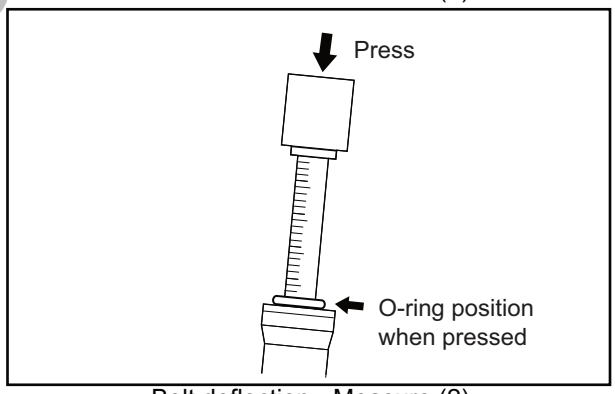


Belt deflection - Measure (1)

(4) Push the tension gauge until its load scale comes to the O-ring position and measure the deflection of belt in this condition. If the deflection amount is within the values shown below, the belt tension is normal.

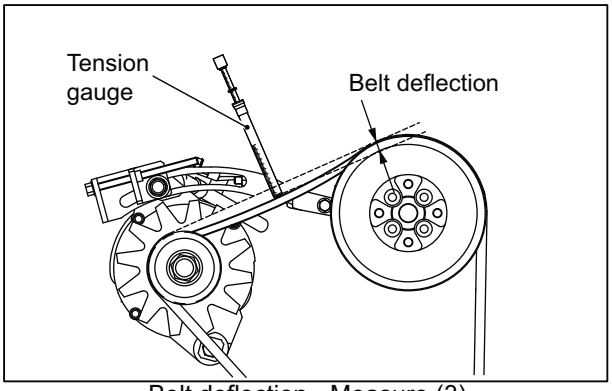
Deflection amount of belt

Item	Standard value
When the belt is new	9 to 11 mm [0.35 to 0.43 in.]
On scheduled inspection	11 to 13 mm [0.43 to 0.51 in.]



Belt deflection - Measure (2)

(5) Adjust the belt tension if the measured result is out of the standard.



Belt deflection - Measure (3)

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GENERAL SAFETY INFORMATION

⚠ WARNING

Do not operate or perform any maintenance on this machine until all instructions found in the OPERATOR'S MANUAL and this MANUAL have been thoroughly read and understood.
Improper operation or maintenance of this machine may cause accidents and could result in serious injury or death.
Always keep the manual in storage.
If it is missing or damaged, place an order with an authorized our Distributor for a replacement.
If you have any questions, please consult an authorized our Distributor.

(1) Most accidents, which occur during operation, are due to neglect of precautionary measures and safety rules. Sufficient care should be taken to avoid these accidents. Erroneous operation, lubrication or maintenance services are very dangerous and may cause injury or death of personnel. Therefore all precautionary measures, NOTES, DANGERS, WARNINGS and CAUTIONS contained in the manual and on the machine should be read and understood by all personnel before starting any work with or on the machine.

(2) Operation, inspection, and maintenance should be carefully carried out, and safety must be given the first priority. Messages of safety are indicated with marks. The safety information contained in the manual is intended only to supplement safety codes, insurance requirements, local laws, rules and regulations.

(3) Messages of safety appear in the manual and on the machine : All messages of safety are identified by either word of "DANGER", "WARNING" and "CAUTION".

1) **DANGER-** Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury and is represented as follows:

⚠ DANGER

2) **WARNING-** Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury and is represented as follows:

⚠ WARNING

3) **CAUTION-** Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against possible damage to the machine and its components and is represented as follows:

⚠ CAUTION

(4) It is very difficult to forecast every danger that may occur during operation. However, safety can be ensured by fully understanding proper operating procedures for this machine according to methods recommended by Manufacturer.

(5) While operating the machine, be sure to perform work with great care, so as not to damage the machine, or allow accidents to occur.

(6) Continue studying the manual until all Safety, Operation and Maintenance procedures are completely understood by all persons working with the machine.

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33.2.2.4 REASSEMBLY

(1) Here, only the reassembly procedures are described. Regarding drawings, refer to the disassembly procedures.
(2) Figures in parentheses after part names in this instruction represent those item numbers in the structural sectional drawing. (Fig."Section(1/6)" to Fig."Section(6/6)")
(3) Precautions on reassembling O-ring
1. Confirm that O-rings are free from defects caused by poor handling.
2. Apply thin coat of grease or hydraulic oil to O-rings and their mating parts.
3. Do not stretch O-rings to the extent that they become permanently set.
4. When installing O-rings, do not roll them into place. Twisted O-rings do not easily untwist by themselves after installation, and can cause oil leaks.
5. Use a torque wrench to tighten each attaching bolt. Tighten to the specified torque in "Maintenance Standards."

33.2.2.4.1 Installing check valve

(1) Load check valve, conflux check valve, and so on
Attach poppet (511) and spring (521) in place, place O-ring (561) in plug (551) and tighten them to the specified torque. (8 places)
(2) Load check valve of swing section
Attach poppet (511) and spring (524) in place, place O-ring (561) in plug (556) and tighten them to the specified torque. (1 place)
(3) Load check valve of arm 2 section
Attach poppet (515) and spring (521) in place, place O-ring (561) in plug (551) and tighten them to the specified torque. (1 place)
(4) Lock valve section
Attach poppet (514) and spring (524) in place, place O-ring (561) in plug (556) and tighten them to the specified torque. (2 places)
(5) Main relief valve section
Attach poppet (512) and spring (522) in place, place O-ring (561) in plug (556) and tighten them to the specified torque. (2 places)

CAUTION

Take care to prevent misassembling of parts and assembling position error because the parts in (1) to (5) are similar in shape.

33.2.2.4.2 Assembling plate

(1) Place O-rings (162), (164) in casing.
(2) Attach plates (212), (213) and tighten socket bolts (274), (275) to the specified torque.
Replace control valve so that this plate face directs downward.

33.2.2.4.3 Assembling back pressure check valve

(1) Attach boost check valve poppet sub (517), by-pass check valve poppet (518) and springs (527), (528).
(2) Attach O-rings (267) in back pressure check valve cover, attach it to casing A (101) and tighten socket bolt (278) to the specified torque.

33.2.2.4.4 Assembling lock valve selector sub

(1) Attach lock valve selector sub (211) to the casing and tighten socket bolt (211-171) to the specified torque.

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