Main Control Valve SP003046
Remote Control Valve (Work Lever/Joystick) SP003015
Travel Control Valve SP003016
Dozer Valve SP003056
Pilot Supply Valve SP003047
EPPR Valve SP003019
2nd Auxiliary Valve (Option) SP003048
Quick Coupler Valve (Option) SP003021
Forced Regeneration Valve SP003022
Hydraulic Schematic SP003049

Electrical System

Electrical System (Europe) SP003050
Electrical System SP003024
Electrical Schematic SP003025

Attachments

Boom and Arm SP003055
Bucket SP001643

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Burn Prevention

When checking radiator coolant level, stop engine, let engine and radiator cool down, then check coolant recovery tank. If coolant level in coolant recovery tank is near upper limit, there is enough coolant in radiator.

Using gloves, loosen radiator cap slowly to release internal pressure before removing radiator cap.

If coolant level in coolant recovery tank is below lower limit, add coolant.

Cooling system conditioner contains alkali which can cause personal injury. Do not allow alkali to contact skin, eyes, or mouth.

Allow cooling system components to cool before draining cooling system.

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

Vent hydraulic tank only after engine has been stopped and hydraulic tank is cool. Using gloves, slowly tilt hydraulic tank air breather to relieve pressure.

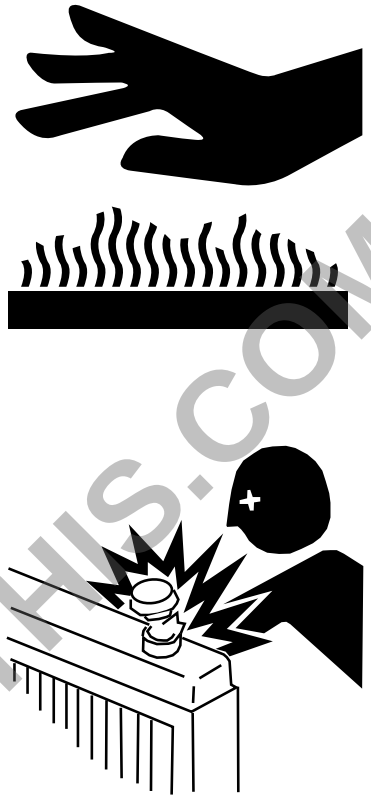
Relieve all pressure in hydraulic oil system, in fuel system, or in cooling system before disconnecting any lines, hoses, fittings, or related components.

Batteries give off flammable fumes that can explode and start a fire.

Do not smoke while you are checking battery electrolyte level.

Electrolyte is an acid. Electrolyte can cause personal injury. Do not allow electrolyte to contact skin or eyes.

Always wear safety goggles and face protection when working with batteries.



HAAE1980

Figure 38

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ENGINE PERFORMANCE CURVES (PER DIN 6270 STANDARD)

DX62R-3/DX63-3 (Europe)

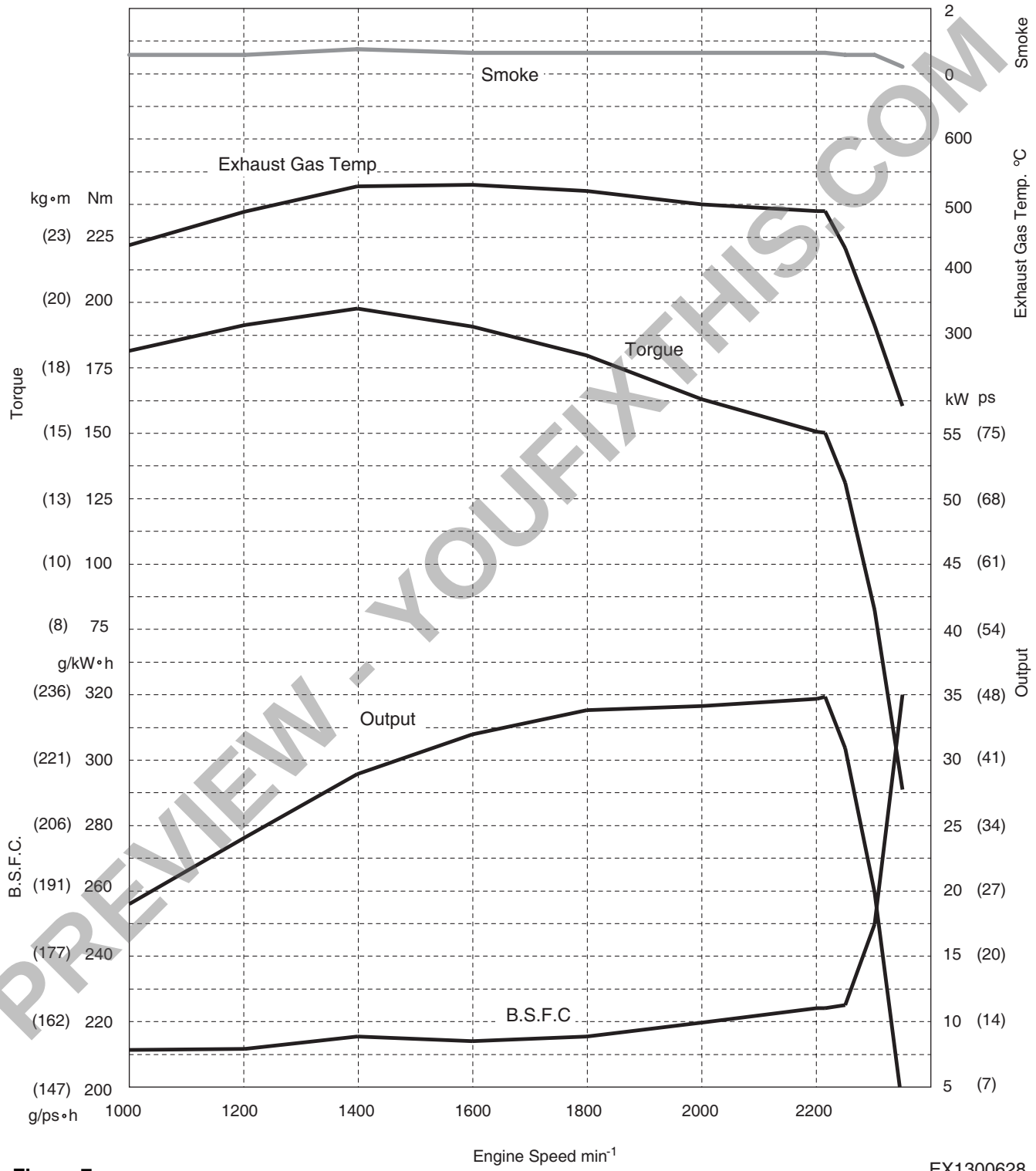


Figure 7

EX1300628

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I. "Loctite" Fastener Adhesives

Product	Application	Color	Removal	Breakaway Cure Strength (in lb) of Sealer Alone
222	Low strength for 6 mm (1/4") or smaller fasteners.	Purple	Hand tools	45
242 or 243	Medium strength for 6 mm (1/4") and larger fasteners.	Blue	Hand tools	80
262	High strength for high-grade fasteners subject to shock, stress and vibration.	Red	Heat/260°C (500°F) Remove HOT (NO solvent)	160
271	Extra high strength for fine thread fasteners up to 25 mm (1") diameter.	Red	Heat/260°C (500°F) Remove HOT	160
272	High temperature/high strength for hostile environments to 232°C (450°F).	Red	Heat/316°C (600°F) Remove HOT	180
277	Extra high strength for coarse thread fasteners 25 mm (1") diameter and larger.	Red	Heat/260°C (500°F) Remove HOT	210

II. "Loctite" Pipe Thread Sealant

Product	Application	Color	Removal	Required Setup
545	"No-filler/nonclog" formula for high-pressure hydraulic systems. Over application will not restrict or foul system components.	Purple	Hand tools	4 Hours (or 1/2 hour with Locquic "T" Primer)
656	Solvent resistant, higher viscosity tapered thread sealer.	White	Hand tools	4 Hours (or 1/2 hour with Locquic "T" Primer)

III. "Loctite" gasket/flange sealer

Product	Application	Color	Notes
518	Gasket eliminator specifically made for aluminum flanges/surfaces. For hydraulic systems to 34,475 kPa (5,000 psi).	Red	Use Locquic "N" primer for fast (1/2 - 4 hours) setup. Unprimed setup 4 - 24 hours.
504	Low-pressure/wide-gap gasket eliminator compound. Fills gaps to 0.0012 mm (0.030"), cures to rigid seal.	Orange	Use Locquic "N" primer for faster (1/2 - 4 hours) setup. Unprimed setup 4 - 24 hours.
515	General purpose, fast setup, flexible-cure gasket eliminator. For nonrigid assemblies subject to shock, vibration or deflection.	Purple	Use Locquic "N" primer for faster (1/4 - 2 hours) setup. Unprimed setup 1 - 12 hours.

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LOWER ROLLER

Steel Track

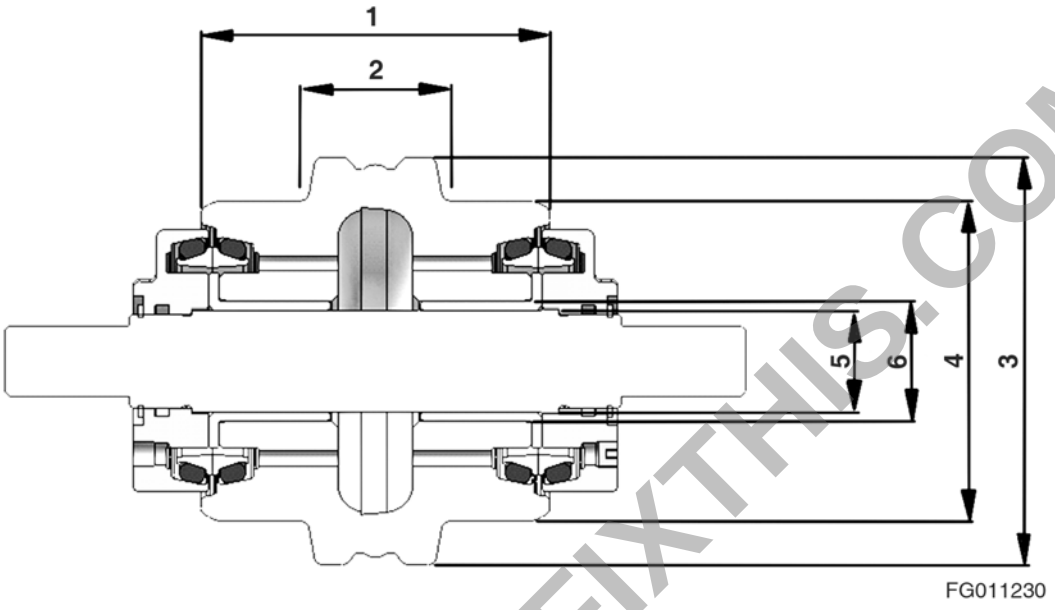


Figure 15

No.	Item	Standard			Limits	Remarks
1	Body Length	120.0 mm (4.72 in)			-	-
2	Flange Width	46.6 mm (1.83 in)			40.6 mm (1.59 in)	Repair
3	Diameter of Flange	140 mm (5.5 in)			-	-
4	Diameter of Link	110 mm (4.33 in)			102 mm (4.02 in)	Repair
5	Shaft-Bushing Clearance	Standard Dimension	Tolerance		Standard Clearance	Allowable wear limit
			Shaft	Hole		
		35 mm (1.38 in)	34.95	35.36	Max: 0.44	Undefinable
			34.925	35.22	Min: 0.27	
6	Body-Bushing Press Fit	Standard Dimension	Tolerance		Standard Fit	Allowable wear limit
			Bushing	Hole		
		41.15 mm (1.6 in)	41.15	41.18	Max: -0.15	Nonoccurrence
			41.1	41.15	Min: -0.07	

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PERIODIC MAINTENANCE

Before You Begin Servicing

Before performing any service procedures within this section, read the following information and instructions for proper disassembly and assembly.

Introduction

This section of the Service Manual describes the procedures for proper care and maintenance of the engine.

The Importance of Periodic Maintenance

Engine deterioration and wear occurs in proportion to length of time the engine has been in service and the conditions the engine is subject to during operation. Periodic maintenance prevents unexpected downtime, reduces the number of accidents because of poor machine performance and helps extend the life of the engine.

Performing Periodic Maintenance

WARNING

AVOID DEATH OR SERIOUS INJURY

Exhaust fumes are poisonous and can cause loss of consciousness and death in a short time.

Never operate the engine in an enclosed area such as a garage, tunnel, underground room, manhole or ship's hold without proper ventilation. Never block windows, vents, or other means of ventilation if the engine is operating in an enclosed area. All internal combustion engines create carbon monoxide gas during operation. Accumulation of this gas within an enclosure could cause illness or even death.

Make sure that all connections are tightened to specifications after repair is made to the exhaust system.



ARO1770L

Figure 16

Perform periodic maintenance procedures in an open, level area free from traffic. If possible, perform the procedures indoors to prevent environmental conditions, such as rain, wind, or snow, from damaging the machine.

DOOSAN Replacement Parts

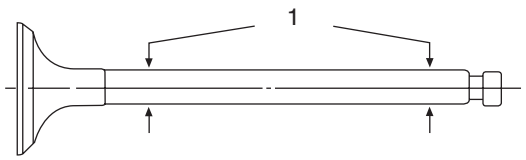
DOOSAN recommends that you use genuine replacement parts when replacement parts are needed. Genuine replacement parts help ensure long engine life.

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Valve Stem Diameter

Use a micrometer to measure the valve stem diameter. Measure the valve stem near the combustion end and near the opposite end (1, Figure 76). See “Intake/Exhaust Valve and Guide” on page -54 for the service limit.

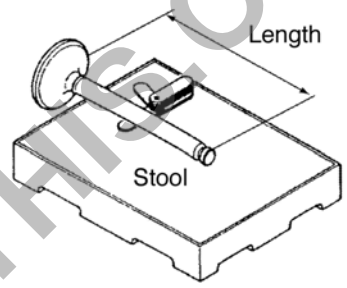


FG008889

Figure 76

Valve Stem Bend

Place the valve stem on a flat inspection block or layout bed. Roll the valve until a gap can be observed between a portion of the valve stem and the surface of the block or bed. Use a feeler gauge to measure the gap (Figure 77). See “Intake/Exhaust Valve and Guide” on page -54 for the service limit.



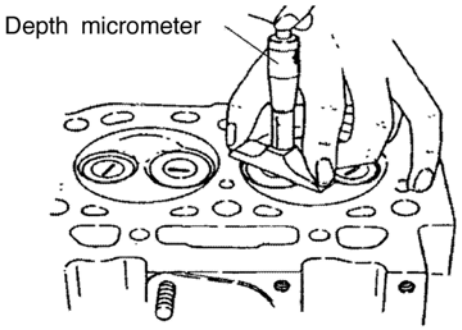
FG008314

Figure 77

Valve Recession

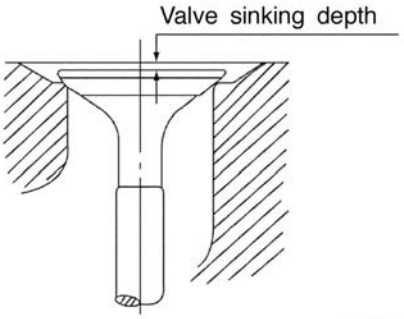
NOTE: *The valve guides must be installed to perform this check.*

Insert the valves into their original locations and press them down until they are fully seated. Use a depth micrometer (Figure 78) to measure the difference between the cylinder head gasket surface and the combustion surface of each exhaust and intake valve (Figure 79). See “Cylinder Head” on page -53 for the service limit.



FG008308

Figure 78



FG008309

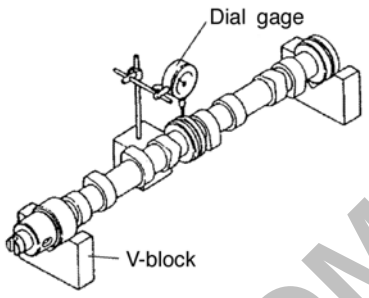
Figure 79

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Inspection of Camshaft

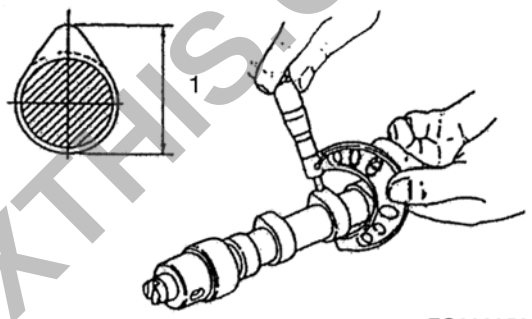
1. Use V-blocks and a dial indicator to check camshaft bend (Figure 180). Place the indicator on the center bearing journal.
2. Rotate the camshaft and observe the runout. See “Camshaft” on page -55 for specifications.



FG008332

Figure 180

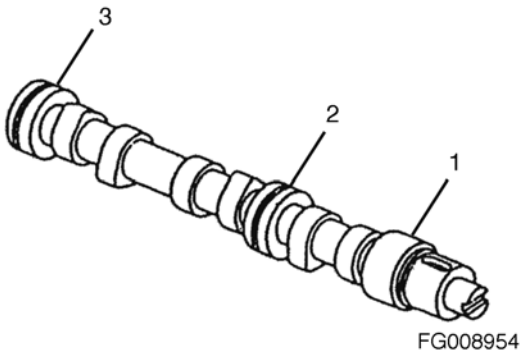
3. Measure the height of each lobe (1, Figure 181) See “Camshaft” on page -55 for specifications.



FG008953

Figure 181

4. Measure the diameter of the gear end (1, Figure 182), intermediate (2, Figure 182) and flywheel end (3, Figure 182) bearing journals. See “Camshaft” on page -55 for specifications.



FG008954

Figure 182

Inspection of Camshaft Bushing and Bores

1. Measure the I.D. of the front bushing and the remaining bores in the cylinder block. See “Camshaft” on page -55 for specifications.
2. If the camshaft bushing is not within specification, replace it using the appropriate service tool. If the remaining bores are not within specification, the cylinder block will require replacement as there are no bearing inserts used.

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Engine Coolant Pump Components

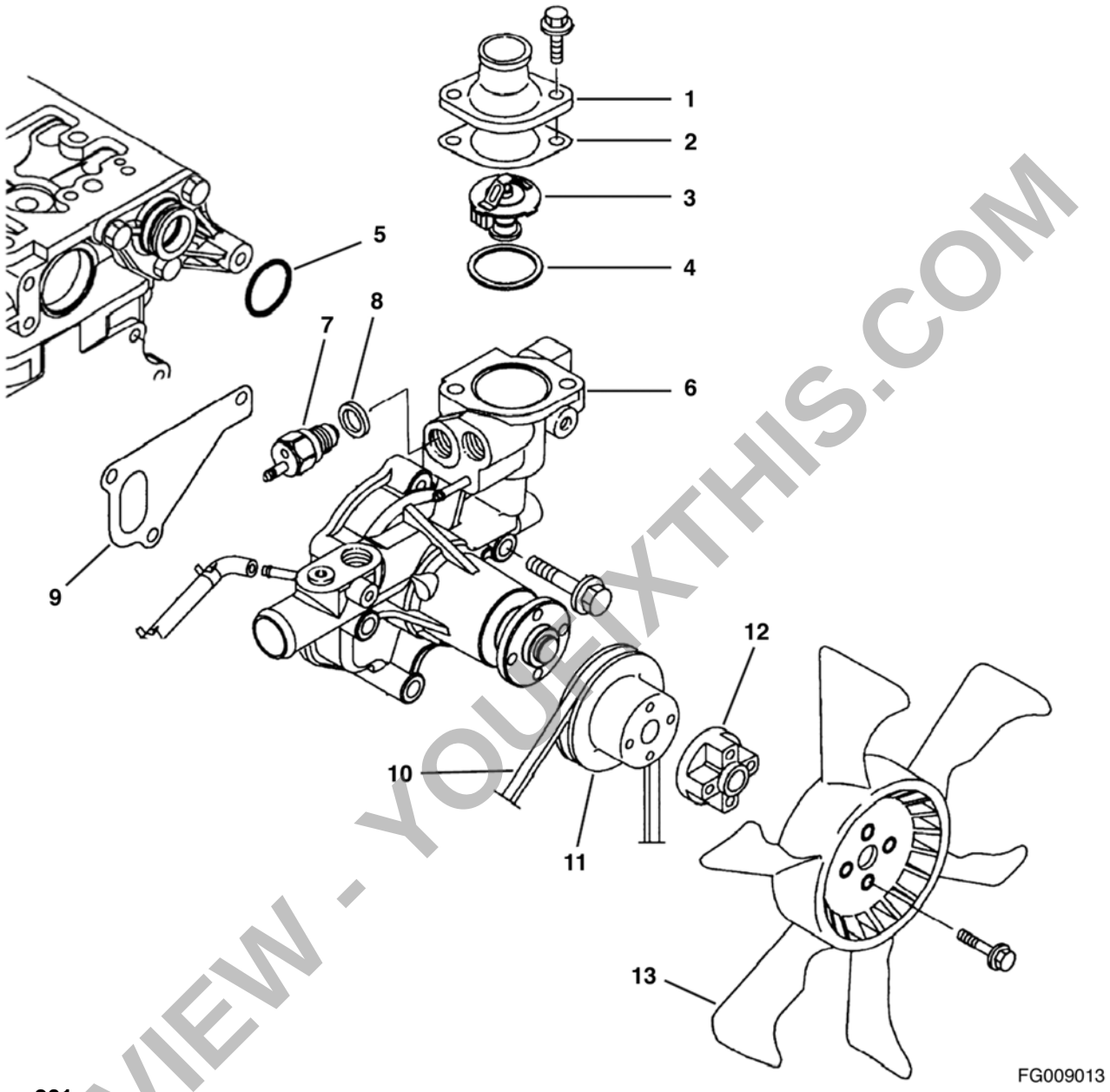


Figure 261

Reference Number	Description
1	Thermostat Cover
2	Thermostat Cover Gasket
3	Thermostat
4	Thermostat O-ring
5	Special O-ring
6	Engine Coolant Pump
7	Temperature Switch

Reference Number	Description
8	Gasket
9	Engine Coolant Pump Gasket
10	V-Belt
11	Engine Coolant Pump V-Pulley
12	Spacer
13	Engine Coolant Fan

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4. Remove screws (1, Figure 353) and the stator assembly (2, Figure 353).
5. Remove rear bearing (3, Figure 353).

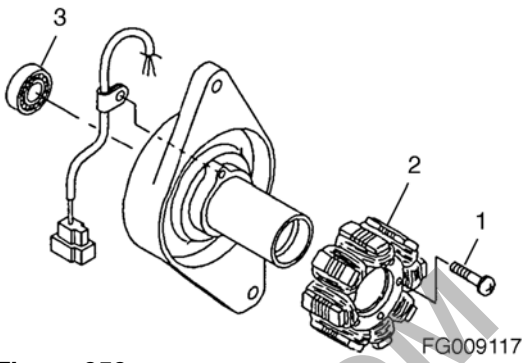


Figure 353

Reassembly of Dynamo

1. Install the rear bearing (3, Figure 354).
2. Install the stator (2, Figure 354) and screws.

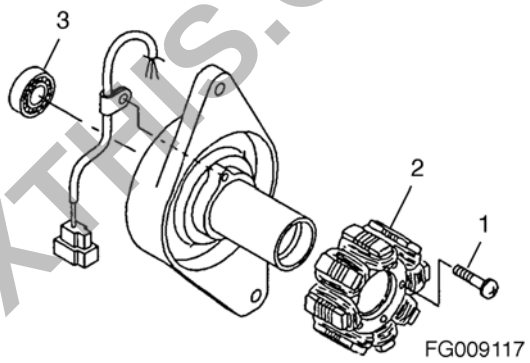


Figure 354

3. Install the front bearings (5, Figure 355) and spacer (6, Figure 355).
4. Install the flat washer (4, Figure 355), flywheel (3, Figure 355, pulley half (2, Figure 355) and through bolt (1, Figure 355).

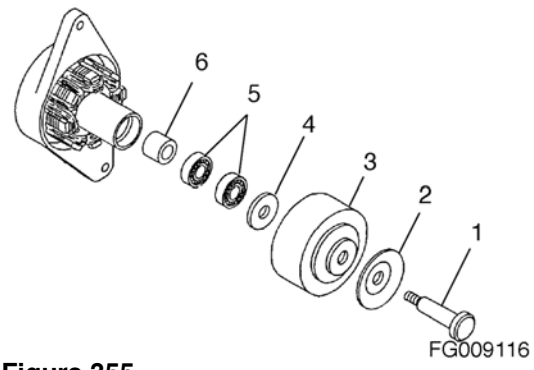


Figure 355

5. Install the flat washer (4, Figure 356), lock washer (3, Figure 356), and nut (2, Figure 356). Tighten the nut to the specified torque.
6. Install the rear cap (1, Figure 356).

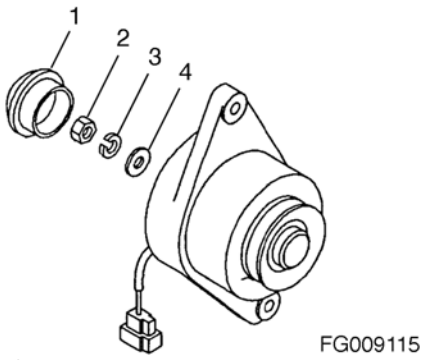


Figure 356

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WARNING

AVOID DEATH OR SERIOUS INJUR

Never remove radiator cap when engine is warm or hot. The cooling system is under pressure and serious burns may result. Allow the engine and cooling system to cool before servicing.

Tighten the radiator cap securely after you check the radiator.

Always check the level of the engine coolant by observing the reserve tank.



HAOA060L

Figure 23

WARNING

AVOID SERIOUS INJURY

Hot engine coolant may splash and burn you. Wait until engine cools before you drain the engine coolant.



HAOA050L

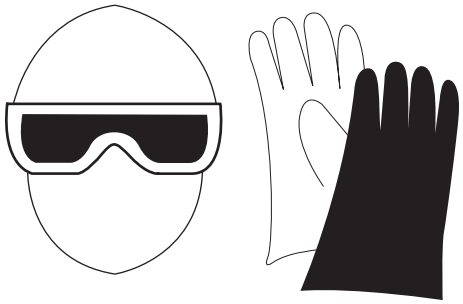
Figure 24

CAUTION

AVOID INJURY

Coolant Hazard!

Wear eye protection and rubber gloves when you handle long life or extended life engine coolant. If contact with the eyes or skin should occur, flush eyes and wash immediately with clean water.



FG009154

Figure 25

IMPORTANT

Only use the engine coolant specified. Other engine coolants may affect warranty coverage, cause an internal buildup of rust and scale and/or shorten engine life.

Prevent dirt and debris from contaminating the engine coolant. Carefully clean the radiator cap and the surrounding area before removing cap.

Never mix different types of engine coolants. This may adversely affect the properties of the engine coolant.

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Installation of Oil Pan

1. Install the oil pickup tube (1, Figure 171) using a new O-ring (2, Figure 171).

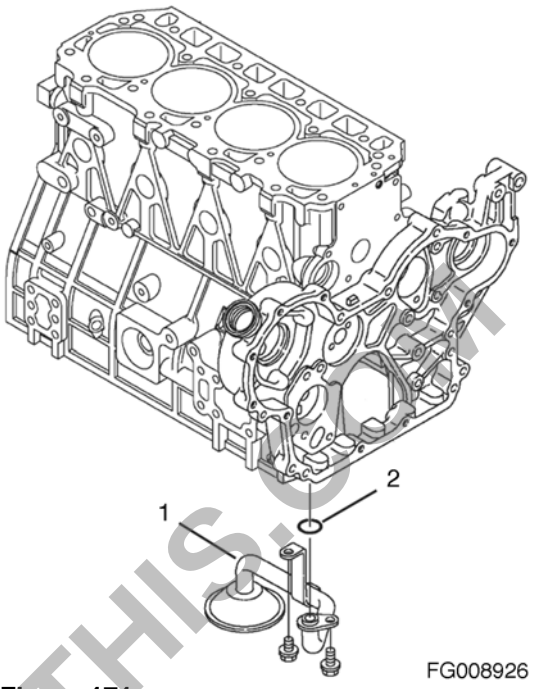


Figure 171

2. Apply a continuous bead of ThreeBond Liquid Gasket to the mounting surface of the oil pan (1, Figure 172). Be sure to circle each bolt hole.
3. Install the oil pan and tighten the bolts securely.

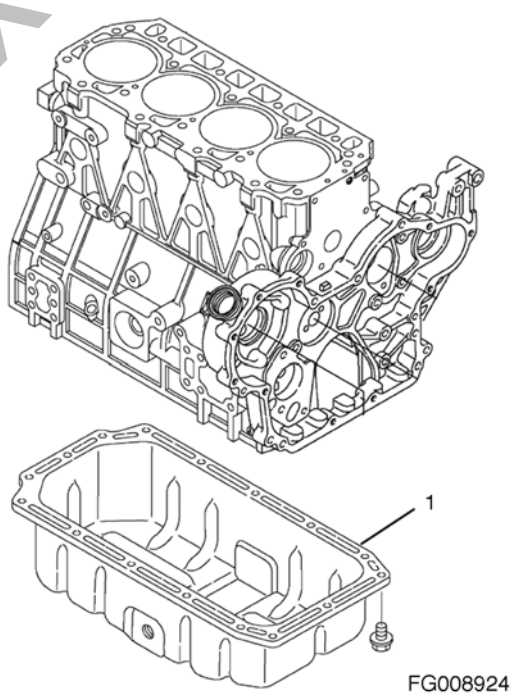


Figure 172

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Field Coil Continuity Test

Check for continuity between the field coil terminals using a multimeter (Figure 247). The multimeter should indicate continuity.

If the multimeter does not indicate continuity, replace the field coil assembly.

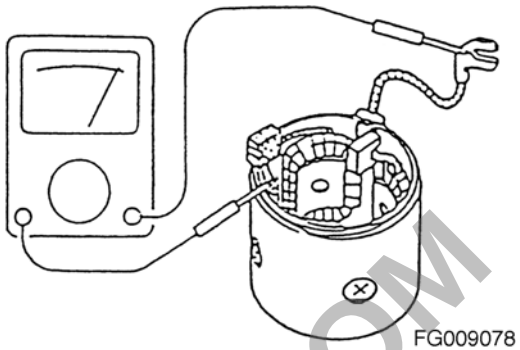


Figure 247

Field Coil Insulation Test

Check for continuity between the field coil terminal and the yoke using a multimeter (Figure 248). The multimeter should not indicate continuity.

If the multimeter indicates continuity, replace the field coil assembly.

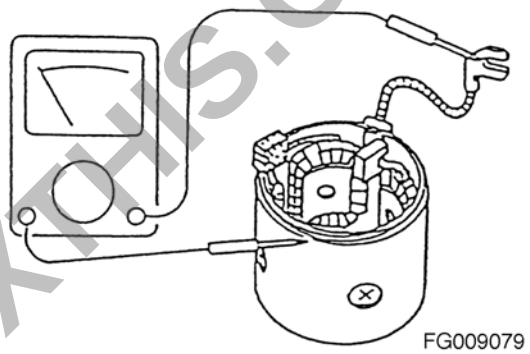


Figure 248

Measure Brush Length

Measure the length of the brush (Figure 249). Replace the brush if the length is less than the limit.

See “Starter Motor Specifications” on page -163 for the service limit.

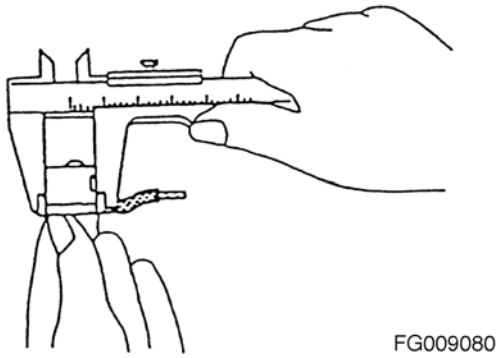


Figure 249

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Electrical Wire Sizes - Voltage Drop

Total current on circuit in amps	Length of conductor from source of current to device and back to source (in feet)																		
	10	15	20	25	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170
12 Volts	Wire Size (AWG)																		
5	18	16	14	12	12	12	10	10	8	8	8	6	6	6	6	6	6	6	6
10	14	12	10	10	10	8	6	6	6	6	4	4	4	4	2	2	2	2	2
15	12	10	10	8	8	6	6	6	4	4	2	2	2	2	2	1	1	1	1
20	10	10	8	6	6	6	4	4	2	2	2	2	1	1	1	0	0	0	2/0
25	10	8	6	6	6	4	4	2	2	2	1	1	0	0	0	2/0	2/0	2/0	3/0
30	10	8	6	6	4	4	2	2	1	1	0	0	0	2/0	2/0	3/0	3/0	3/0	3/0
40	8	6	6	4	4	2	2	1	0	0	2/0	2/0	3/0	3/0	3/0	4/0	4/0	4/0	4/0
50	6	6	4	4	2	2	1	0	2/0	2/0	3/0	3/0	4/0	4/0	4/0				
60	6	4	4	2	2	1	0	2/0	3/0	3/0	4/0	4/0	4/0						
70	6	4	2	2	1	0	2/0	3/0	4/0	4/0									
80	6	4	2	2	1	0	3/0	3/0	4/0	4/0									
90	4	2	2	1	0	2/0	3/0	4/0	4/0										
100	4	2	2	1	0	2/0	3/0	4/0											
24 Volts																			
5	18	18	18	16	16	14	12	12	12	10	10	10	10	10	8	8	8	8	8
10	18	16	14	12	12	10	10	10	8	8	8	6	6	6	6	6	6	6	6
15	16	14	12	12	10	10	8	8	6	6	6	6	6	4	4	4	4	4	2
20	14	12	10	10	10	8	6	6	6	6	4	4	4	4	2	2	2	2	2
25	12	12	10	10	8	6	6	6	4	4	4	4	2	2	2	2	2	2	1
30	12	10	10	8	8	6	6	4	4	4	2	2	2	2	2	1	1	1	1
40	10	10	8	6	6	6	4	4	2	2	2	2	1	1	1	0	0	0	2/0
50	10	8	6	6	6	4	4	2	2	2	1	1	0	0	0	2/0	2/0	2/0	3/0
60	10	8	6	6	4	4	2	2	1	1	0	0	0	2/0	2/0	3/0	3/0	3/0	3/0
70	8	6	6	4	4	2	2	1	1	0	0	2/0	2/0	3/0	3/0	3/0	3/0	4/0	4/0
80	8	6	6	4	4	2	2	1	0	0	2/0	2/0	3/0	3/0	3/0	4/0	4/0	4/0	4/0
90	8	6	4	4	2	2	1	0	0	2/0	2/0	3/0	3/0	4/0	4/0	4/0	4/0	4/0	
100	6	6	4	4	2	2	1	0	2/0	2/0	3/0	3/0	4/0	4/0	4/0				

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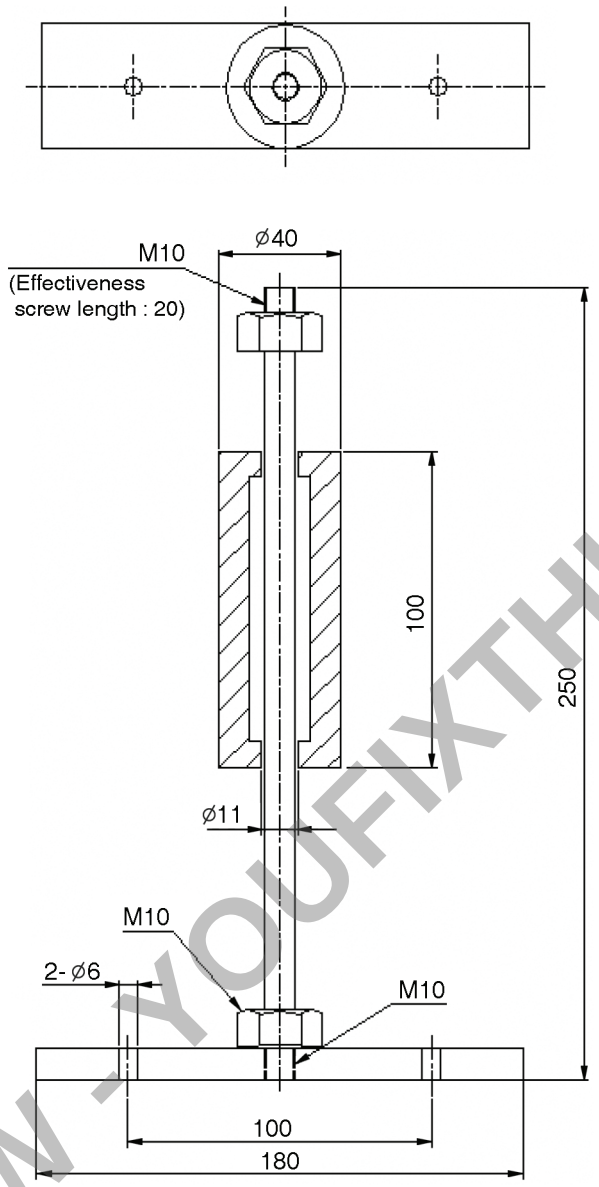
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Reference Number	Description
1	Tube Assembly
2	Bushing
3	Rod Assembly
4	Bushing
5	Rod Cover
6	Bushing
7	Retaining Ring
8	Buffer Seal
9	U-packing
10	Dust Wiper
11	Retaining Ring
12	O-ring

Reference Number	Description
13	Backup Ring
14	O-ring
15	Cushion Ring
16	Piston
17	Glyd Ring
18	Wear Ring
19	Dust Ring
20	O-ring
21	Backup Ring
22	Piston Nut
23	Set Screw

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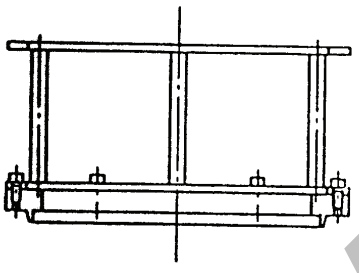
Figure 9 Special Tool for Removing the Brake Piston

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F/S Installation Tool (II)

For installing floating seal (31) to hub (1) and spindle (2).

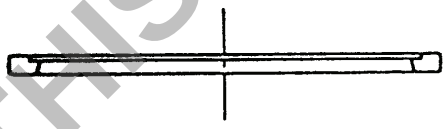


AXS0420S

Figure 23

F/S Installation Tool (III)

For installing floating seal (31) to spindle (2).

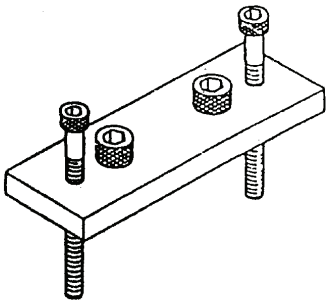


AXS0430S

Figure 24

Cover Removable Tool

For removing cover (8) from hub (1).

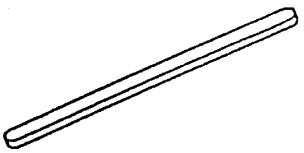


AXS0440S

Figure 25

Slice

For removing timing plate (109) from rear flange (201).



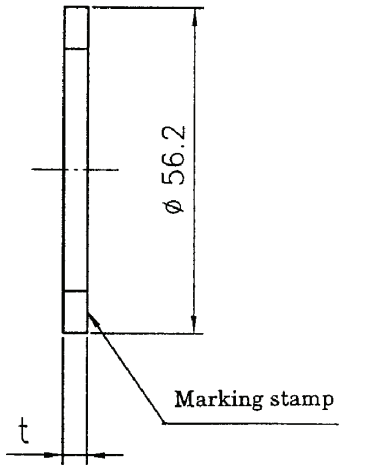
AXS0450S

Figure 26

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CLEARANCE ADJUSTMENT
PART DIMENSIONS

Part Name	Dimensions	
Retaining ring (20)	Classification Symbol	Dimension (T)
 AXS0540S **NOTE:** *56.2 mm (2.21 in)*	A	1.75 mm < T ≤1.80 mm (0.07 in < T ≤0.0709 in)
	B	1.80 mm < T ≤1.85 mm (0.0709 in < T ≤0.0728 in)
	C	1.85 mm < T ≤1.90 mm (0.0728 in < T ≤0.0748 in)
	D	1.90 mm < T ≤1.95 mm (0.0748 in < T ≤0.0768 in)
	E	1.95 mm < T ≤2.00 mm (0.0768 in < T ≤0.0787 in)
	F	2.00 mm < T ≤2.05 mm (0.0787 in < T ≤0.0807 in)
	G	2.05 mm < T ≤2.10 mm (0.0807 in < T ≤0.0827 in)
	H	2.10 mm < T ≤2.15 mm (0.0827 in < T ≤0.0846 in)
	I	2.15 mm < T ≤2.20 mm (0.0846 in < T ≤0.0866 in)
	J	2.20 mm < T ≤2.25 mm (0.0866 in < T ≤0.0886 in)
	K	2.25 mm < T ≤2.30 mm (0.0886 in < T ≤0.0906 in)
	L	2.30 mm < T ≤2.35 mm (0.0906 in < T ≤0.0925 in)
	M	2.35 mm < T ≤2.40 mm (0.0925 in < T ≤0.0945 in)
	N	2.40 mm < T ≤2.45 mm (0.0945 in < T ≤0.0965 in)
	O	2.45 mm < T ≤2.50 mm (0.0965 in < T ≤0.0984 in)

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General Information Concerning Control Block Connection

When removing the block, all openings must be plugged immediately to prevent any contamination of the hydraulic system.

When replacing the block, remove plastic plugs from the openings and lines just before making the connections.

Do not tighten connectors to a torque greater than that specified in the assembly instructions.

Check the hydraulic installation's oil quality and filtration capacity during all servicing/maintenance operations.

The use of Teflon tape, hemp and joint filler is prohibited.

Hydraulic lines and connections must not be under any strain whatsoever.

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13. Assemble the cam (26) on the cover (18) and insert it on one end of the camshaft (23).

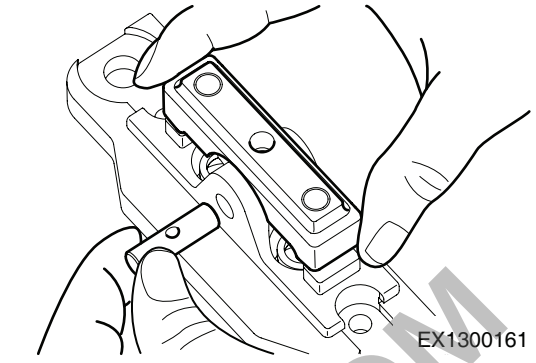

EX1300161

Figure 38

14. Apply Loctite #241 or equivalent material on the surface of the hexagonal hole set, and tighten it according to the regulated torque.

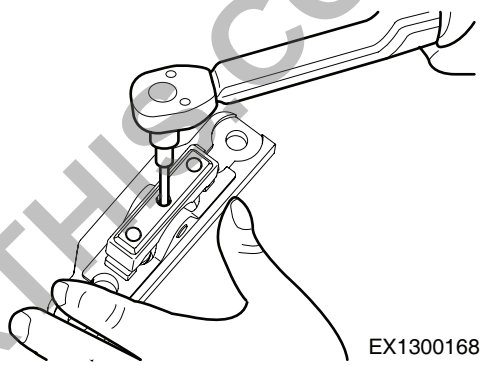

EX1300168

Figure 39

15. Assemble the casing [2] (2) on the casing [1] (1).

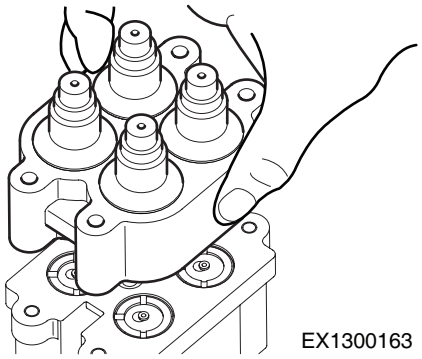

EX1300163

Figure 40

16. Apply the grease on the top of the push rod (14) and top of the plug (17).

    NOTE: *When applying the grease, use the spoon made of soft material so it does not damage the surface of the push rod and plug.*

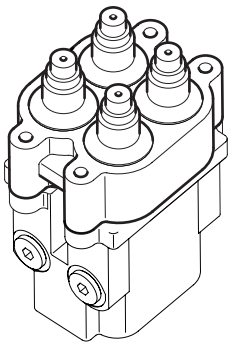

EX1300180

Figure 41

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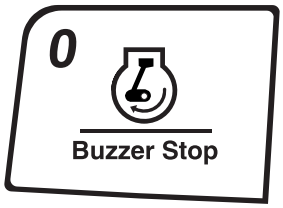
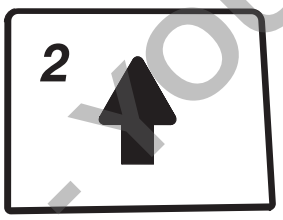
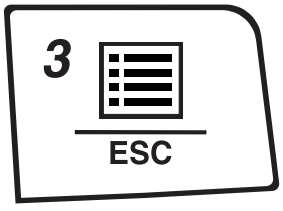
Quick Coupler Valve (Option)

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Function Button

Description	Symbol	Operation	Remarks
Auto Idle Selector Button	 FG017865	Auto Idle or Buzzer Stop	Password "0"
Home Button	 FG017866	Return to the Initial Screen	Password "1"
Up Arrow Button	 FG017867	Upward Move	Password "2"
Access Button (ESC - Escape)	 FG017868	Menu Access/ Escape or Special Menu Access (after pressing for more than 5 seconds)	Password "3"

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SAFETY INSTRUCTIONS

WARNING

AVOID DEATH OR SERIOUS INJURY

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments repairs or service. Untrained operators and failure to follow instructions can cause death or serious injury.

APPLICABLE MODELS

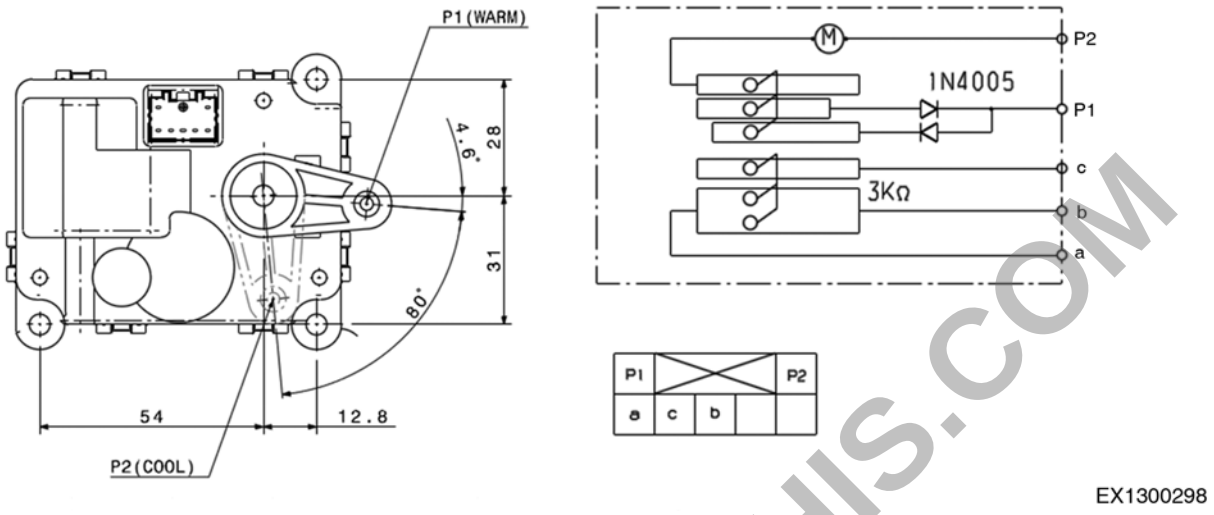
The contents of this section apply to the following models and serial number ranges.

MODEL	SERIAL NUMBER RANGE
DX63-3 (NA)	1001 and Up
DX85R-3	1001 and Up

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Coolant Flow Control Valve



EX1300298

Figure 53

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