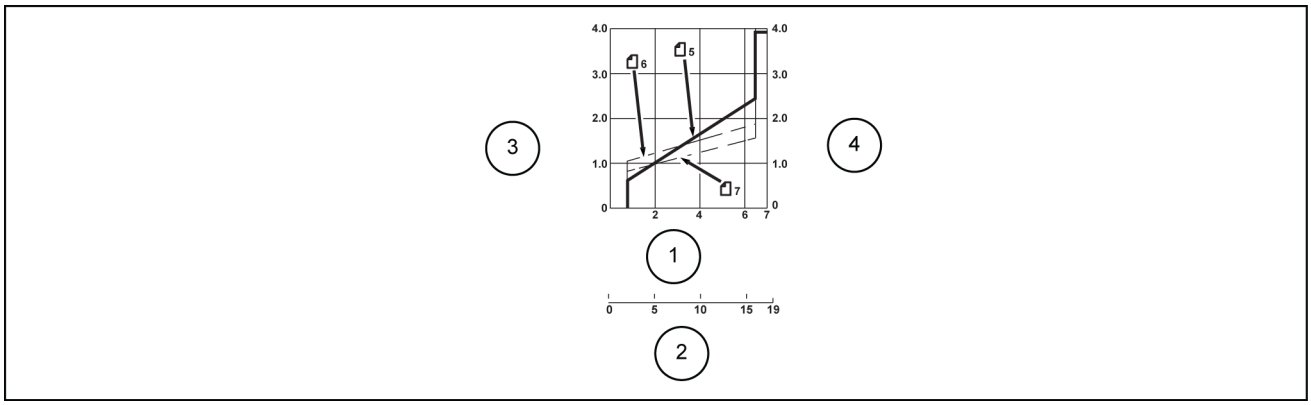
CX350D
LC Version
Tier 4B (final)
Crawler Excavator

SERVICE MANUAL

Part number 47843026
1st edition English
March 2015

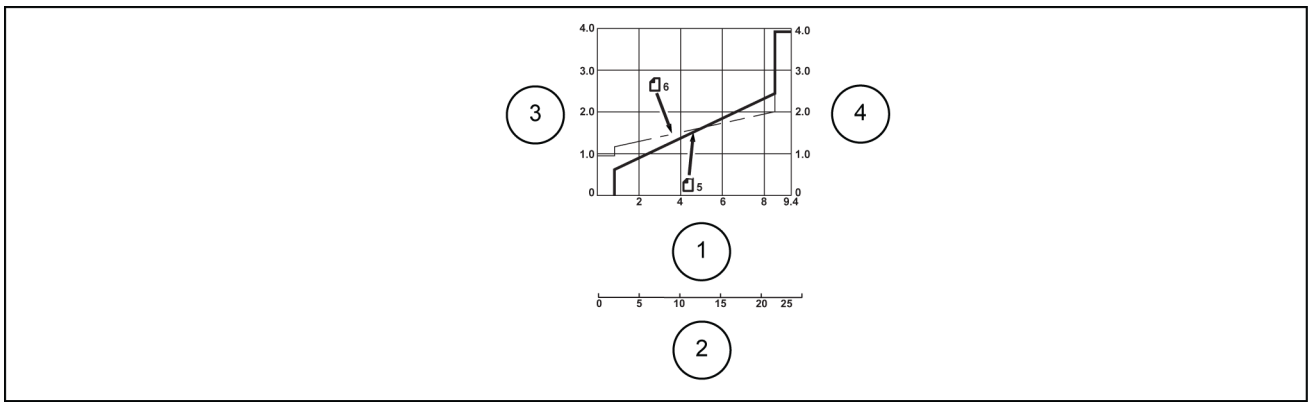
CASE

Operation remote control valve control diagram



SMIL14CEX2902EB 2

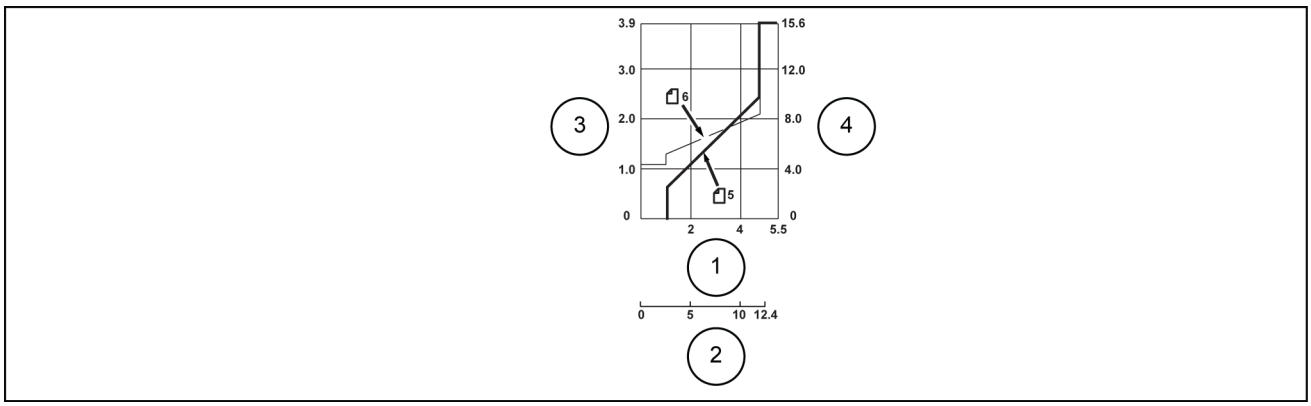
1	Push rod stroke [mm (in)]	5	Secondary pressure
2	Operating angle [deg.]	6	Independent operating torque (Port 1)
3	Secondary pressure [MPa (psi)]	7	Independent operating torque (Port 3)
4	Operating torque [Nm]		



SMIL14CEX2903EB 3

1	Push rod stroke [mm (in)]	4	Operating torque [Nm]
2	Operating angle [deg.]	5	Secondary pressure
3	Secondary pressure [MPa (psi)]	6	Independent operating torque

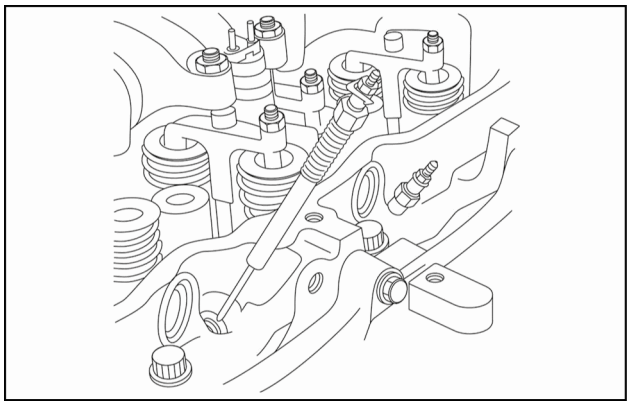
Travel remote control valve control diagram



SMIL14CEX2904EB 4

1	Push rod stroke [mm (in)]	4	Operating torque [Nm]
2	Operating angle [deg.]	5	Secondary pressure
3	Secondary pressure [MPa (psi)]	6	Independent operating torque

2. Remove the glow plug from the cylinder head assembly.

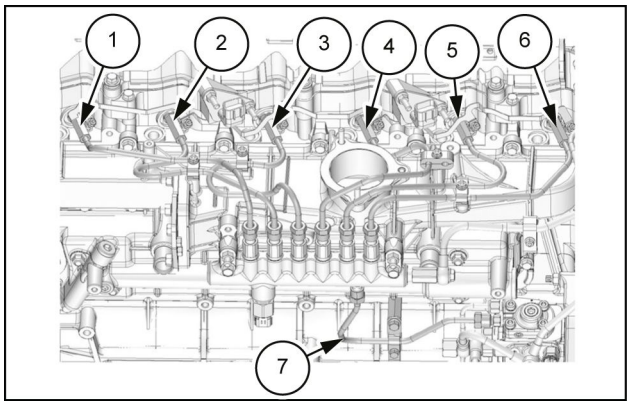


SMIL14CEX2998AA 29

Injection pipe removal

1. Remove the clip from the inlet pipe.
2. Remove the injection pipe from the injector and the common rail assembly.

> ⚠ CAUTION:
>
> - Do not reuse the removed injection pipe.
> - Seal the common rail and injector to prevent foreign material from entering.



SMIL14CEX2999AB 30

1. No.1 injection pipe
2. No.2 injection pipe
3. No.3 injection pipe
4. No.4 injection pipe
5. No.5 injection pipe
6. No.6 injection pipe
7. Fuel pipe

Fuel pipe removal

1. Remove the fuel pipe from the fuel supply pump and the common rail assembly.

NOTE: *Remove the clip.*

> ⚠ CAUTION: Do not reuse the removed gasket.

Flywheel installation

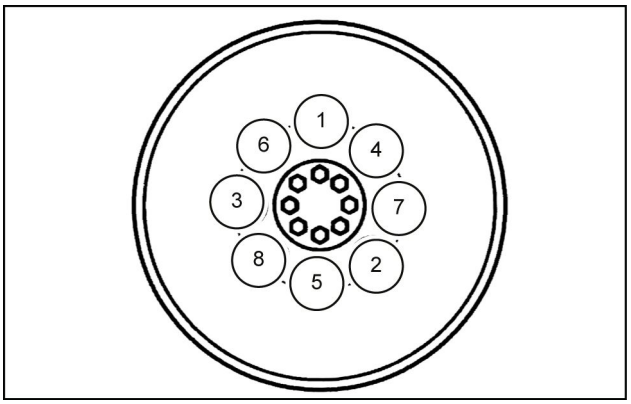
1. Apply the disulfide molybdenum grease to the bolt.

NOTE: *Apply to the seat surface and threaded portion on the flywheel installation bolts.*

2. Install the flywheel to the crankshaft.

   ⚠ CAUTION: Pay attention to the knock pin position of the crankshaft.

NOTE: *Tightening order*



SMIL14CEX3191AB 44

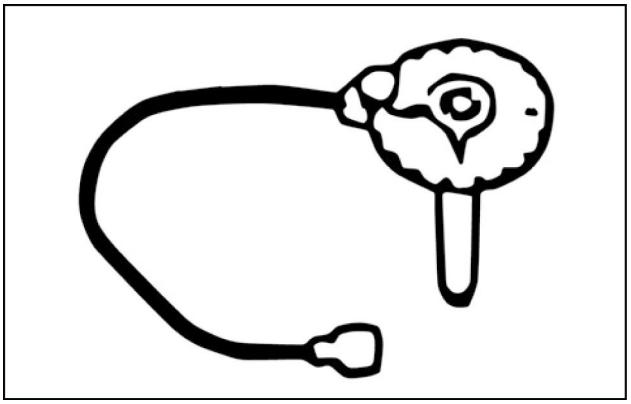
3. Tighten the bolt using the torque wrench.

   Tightening torque: **78 N·m** (**58 lb ft**)

4. Tighten the bolt using the special tool.

   Tightening angle: **60 °**

   Special tool: Angle gauge (Refer to **Cylinder heads - Special tools (10.101)**)



SMIL14CEX3073AA 45

5. Tighten the bolt using the special tool.

   Tightening angle: **60 °**
   Special tool: Angle gauge (Refer to **Cylinder heads - Special tools (10.101)**)

6. Tighten the bolt using the torque wrench.

   Tightening torque: **274 N·m** (**202 lb ft**)

12. Start the engine.

NOTE: *For models with heaters, the set temperature and blower speed are set to the maximum, and warm up the engine at approximately* ***1500 - 2000 RPM****.*
Touch the radiator upper hose, and confirm that it has become warm.

> ⚠ CAUTION: If the upper hose is not warm, perform step **12** again.

NOTE: *Idle the engine for* ***5 min****.*

13. Stop the engine.

14. Remove the radiator cap from the radiator.

> ⚠ CAUTION: Confirm that the engine has cooled.

15. Replenish the radiator with coolant.

NOTE: *Add an amount of coolant equal to the difference between the remaining coolant level and the radiator cap mouth.*

> ⚠ CAUTION: If the coolant amount is excessively low, inspect for coolant leakage.

16. Install the radiator cap to the radiator.

> ⚠ CAUTION: Securely attach the radiator cap.

17. Add coolant to the radiator reserve tank.

NOTE: *Add up to the MAX line of the radiator reserve tank.*

> ⚠ CAUTION: If the level of the radiator reserve tank has fallen the next morning, add coolant up to the MAX line.

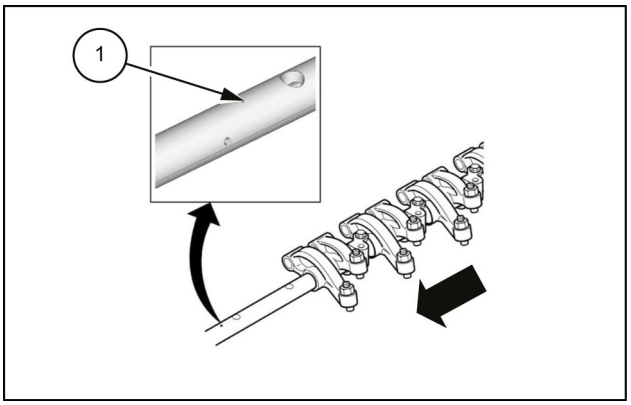
Fuel air bleed

Refer to **Fuel injection system - Bleed (10.218)**.

Rocker shaft - Assemble

1. Check the front mark **(1)** of the rocker arm shaft.

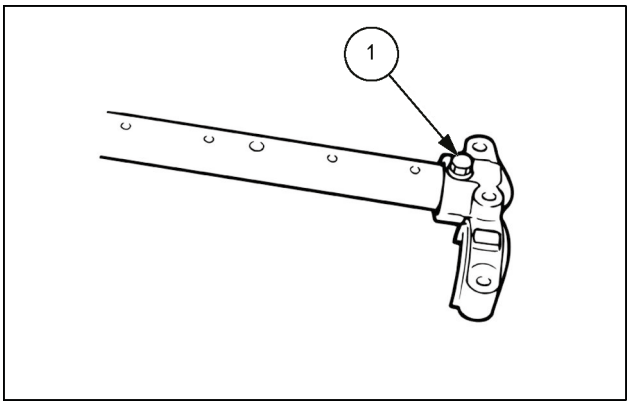
> ⚠ CAUTION: Assemble with the front mark of the rocker arm shaft shown in the diagram facing toward the front and top of the engine.



SMIL14CEX3400AB 1

2. Temporarily tighten the camshaft bearing cap to the rocker arm shaft.

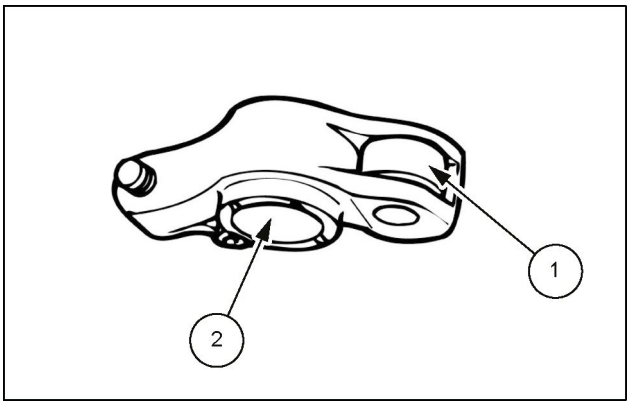
NOTE: *Temporarily tighten the rear side camshaft bearing cap **(1)**.*
Temporarily tighten while in the assembly and completely tighten when installing the cylinder head.



SMIL14CEX3401AB 2

3. Apply the engine oil to the rocker arm.

NOTE: *Apply to the roller **(1)** and bush inner diameter **(2)**.*



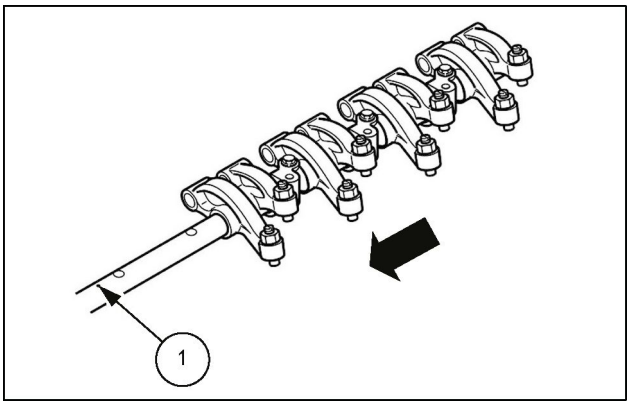
SMIL14CEX3402AB 3

4. Install the rocker arm to the rocker arm shaft.
5. Install the washer to the rocker arm shaft.
6. Install the bracket to the rocker arm shaft.

> ⚠ CAUTION: Confirm that the inlet rocker arm is assembled to the front side.

1. Front mark

NOTE: *Install on the same location as before the disassembly.*



SMIL14CEX3403AB 4

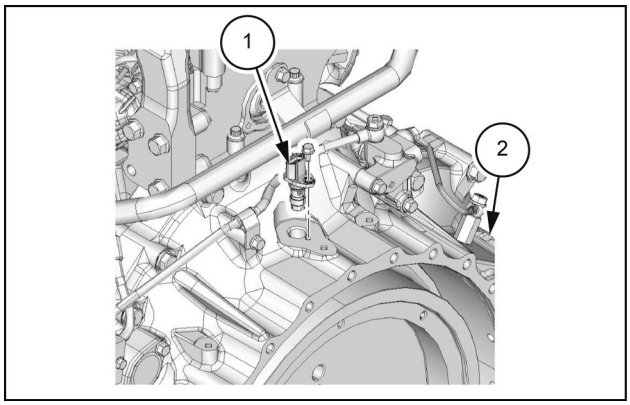
CKP sensor installation

1. Install the CKP sensor **(1)** to the flywheel housing **(2)**.

> ⚠ CAUTION: Be careful not to subject the sensor to shock.

NOTE: *Tighten together with the clip. tightening torque:* ***6 N·m*** *(****4 lb ft****)*

2. Connect the harness connector to the CKP sensor **(1)**.



SMIL14CEX3131AB 21

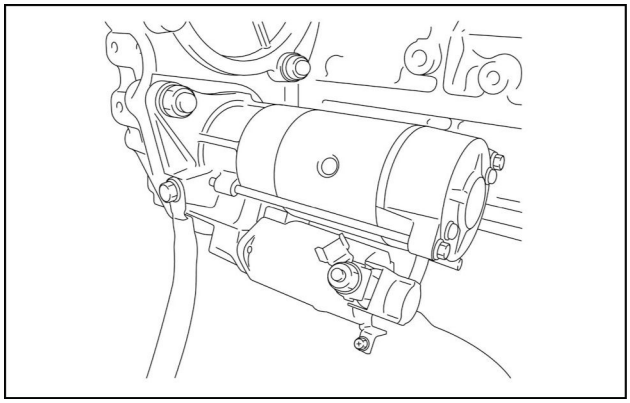
Starter assembly installation

1. Install the starter assembly to the flywheel housing.

   Tightening torque: **82 N·m** (**60.5 lb ft**)

2. Connect the earth cable to the starter assembly.

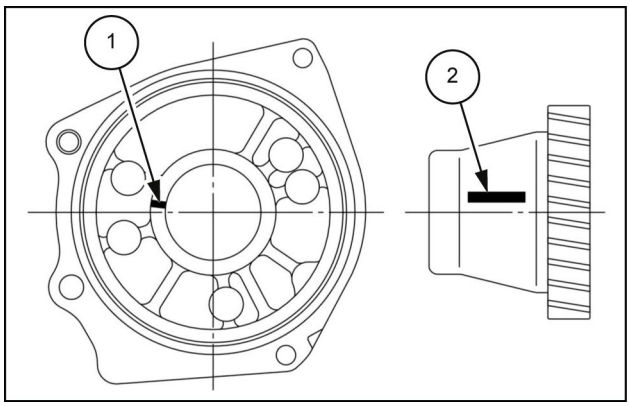
   Tightening torque: **19 N·m** (**14 lb ft**)



SMIL14CEX3192AA 22

Fuel supply pump installation

1. Align No.1 cylinder to the compression top dead center.
   1. Supply pump bracket side slit.
   2. Supply pump gear side alignment mark.
2. Align alignment mark to the bracket.



SMIL14CEX3193AB 23

2. Prepare the feeler gauge.

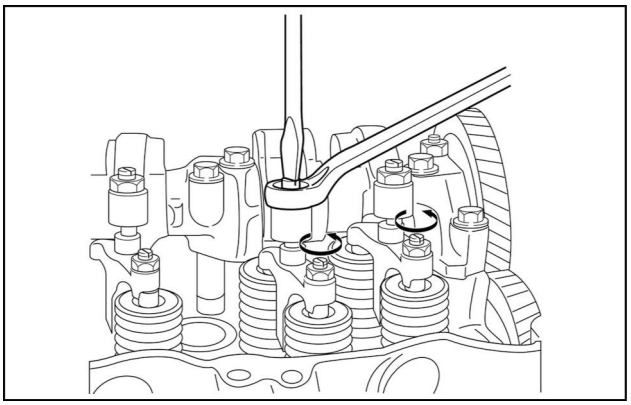
   Thickness: **0.4 mm** (**0.0157 in**)

NOTE: *Insert the thickness gauge between the rocker arm and bridge cap.*

3. Turn the adjust screw.

NOTE: *When the movement of the thickness gauge becomes stiff, secure the adjust screw nut of the rocker arm.*

   Tightening torque: **22 N·m** (**16 lb ft**)



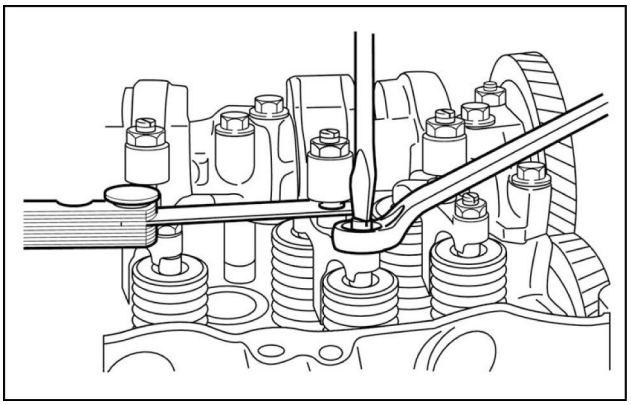
SMIL14CEX3083AA 10

4. Turn the adjust screw.
5. With the thickness gauge inserted, lightly tighten the adjust screw of the bridge.
6. Confirm that the leading end of the adjust screw and valve shaft end have made contact and the movement of the thickness gauge has become stiff.
7. Check if the valve shaft end on the opposite side is floating or touching at an angle
8. If it is floating or touching at an angle, slightly loosen the bridge adjust screw and adjust the valve shaft ends on both sides to touch properly.

   Clearance: less than **0.1 mm** (**0.0039 in**) between valve and bridge

NOTE: *To prevent turning, fix the bridge adjust screw with a flathead screwdriver, and tighten the adjust screw nut.*

   Tightening torque: **22 N·m** (**16 lb ft**)



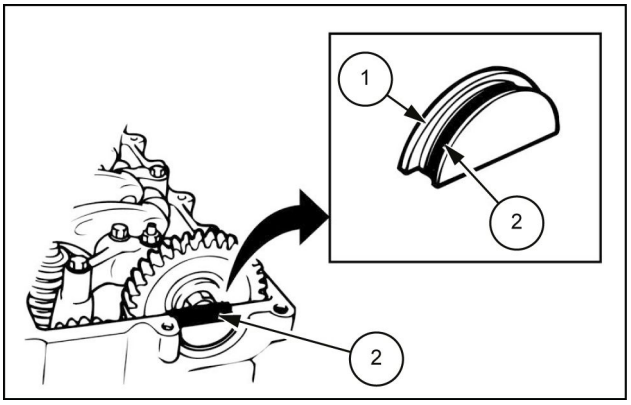
SMIL14CEX3085AA 11

Adjustment table												
Cylinder No.	**1**		**2**		**3**		**4**		**5**		**6**	
Valve	IN	EX	IN	EX	IN	EX	IN	EX	IN	EX	IN	EX
No.1 cylinder compression top dead center (O mark is an adjustable part)	O	O	O			O	O			O		
No.6 cylinder compression top dead center (O mark is an adjustable part)				O	O			O	O		O	O

Lower cover installation

1. Apply the liquid gasket **(2)** to the rubber plug **(1)**.

NOTE: *Apply ThreeBond 1207B.*



SMIL14CEX3084AB 12

Valve seat insert removal

1. Heat the valve seat insert with the gas burner.

   Heating temperature: **700 - 800 °C** (**1292 - 1472 °F**): 2 sections inner surface of the insert

   Specified time: **5 min** Natural cooling

NOTE: *Cool the valve seat insert naturally after heating.*

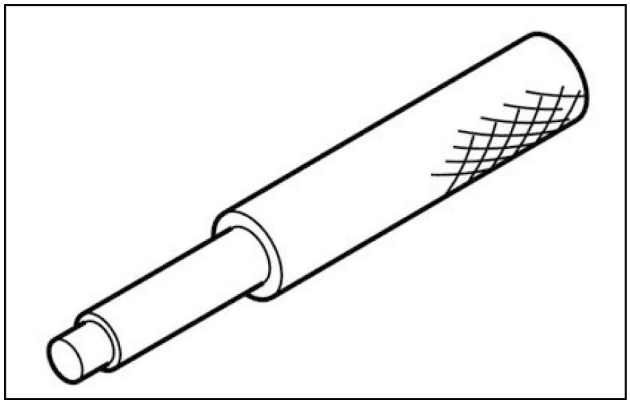
2. Remove the valve seat insert from the cylinder head assembly using the driver.

   ⚠ CAUTION: Be careful not to damage the cylinder head.

Injector sleeve removal

1. Remove the injector sleeve **(1)** from the cylinder head assembly using the special tool.

   Special tool: Nozzle sleeve remover (Refer to **Cylinder head - Special tools (10.101)**)

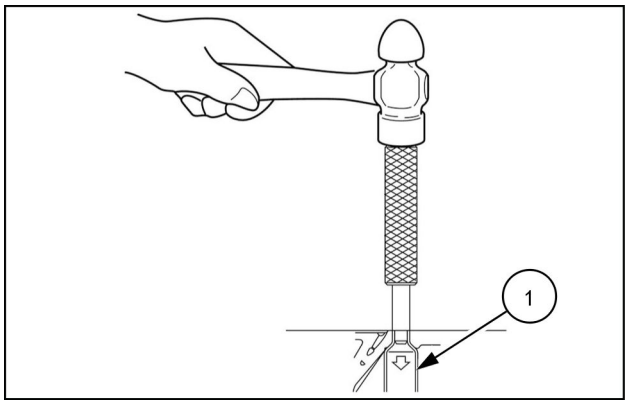


SMIL14CEX3033AA 19

   Tap the injector sleeve **(1)** out from the bottom surface of the cylinder head.

   ⚠ CAUTION:

   - Be careful not to damage the bottom surface of the cylinder head.
   - Do not reuse the removed injector sleeve.



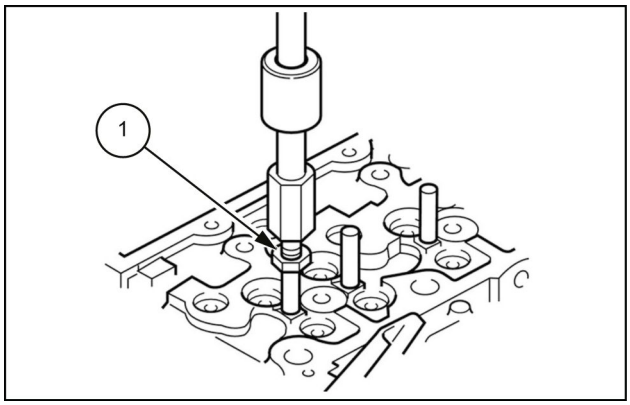
SMIL14CEX3034AA 20

Bridge guide removal

1. Install the nut **(1)** to the bridge guide.

NOTE: *Electrically weld the nut **(1)** to the top of the bridge guide.*

2. Remove the bridge guide from the cylinder head assembly using the sliding hammer.



SMIL14CEX3035AB 21

4. Install the water feed pipe **(4)** to the cylinder block.

   Tightening torque: **41 N·m** (**30 lb ft**)

   Tightening torque: **24 N·m** (**17 lb ft**)

   Clip **(2)**

   ⚠ CAUTION: Use a new gasket.

5. Connect the water feed pipe **(4)** to the turbocharger assembly.

   Tightening torque: **41 N·m** (**30 lb ft**)

   ⚠ CAUTION: Use a new gasket.

6. Install the water return pipe **(5)** to the cylinder block.

   Tightening torque: **41 N·m** (**30 lb ft**)

   Tightening torque: **24 N·m** (**17 lb ft**)

   Clip **(2)**

   ⚠ CAUTION: Use a new gasket.

7. Connect the water return pipe **(5)** to the turbocharger assembly.

   Tightening torque: **41 N·m** (**30 lb ft**)

   ⚠ CAUTION: Use a new gasket.

8. Install the oil return pipe **(3)** to the cylinder block.

   Tightening torque: **24 N·m** (**17 lb ft**)

   ⚠ CAUTION: Use a new gasket.

9. Connect the oil return pipe **(3)** to the turbocharger assembly.

   Tightening torque: **24 N·m** (**17 lb ft**)

   ⚠ CAUTION: Use a new gasket.

10. Install the oil feed pipe **(1)** to the pipe bracket.

    Tightening torque: **34 N·m** (**25 lb ft**)

    Tightening torque: **24 N·m** (**17 lb ft**)

    ⚠ CAUTION: Use a new gasket.

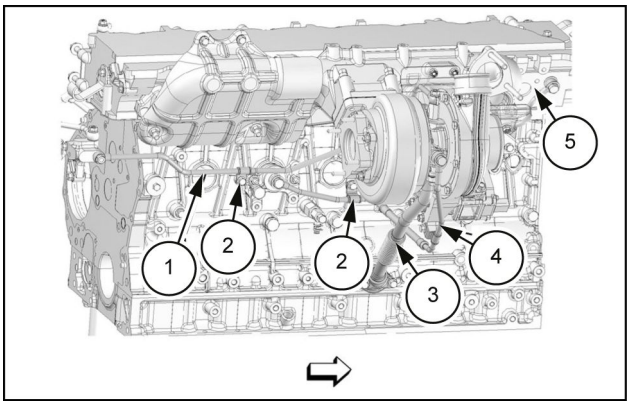
11. Connect the oil feed pipe **(1)** to the turbocharger assembly.

    Tightening torque: **34 N·m** (**25 lb ft**)

    Tightening torque: **24 N·m** (**17 lb ft**)

    ⚠ CAUTION: Use a new gasket.

12. Install the exhaust pipe to the turbocharger assembly.



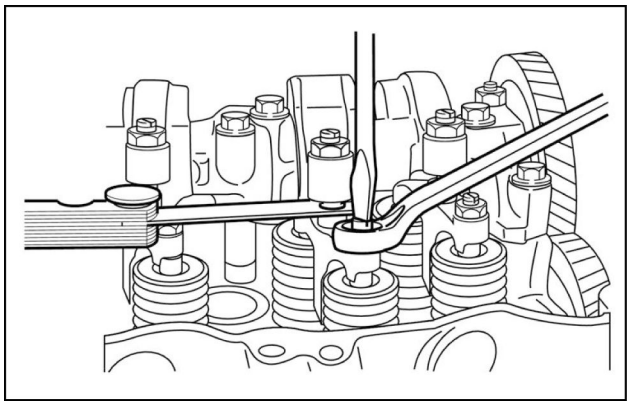
SMIL14CEX2955AB 46

4. Turn the adjust screw.
5. With the thickness gauge inserted, lightly tighten the adjust screw of the bridge.
6. Confirm that the leading end of the adjust screw and valve shaft end have made contact and the movement of the thickness gauge has become stiff.
7. Check if the valve shaft end on the opposite side is floating or touching at an angle.
8. If it is floating or touching at an angle, slightly loosen the bridge adjust screw and adjust the valve shaft ends on both sides to touch properly.

   Clearance : Less than **0.1 mm** (**0.0039 in**) between valve and bridge

NOTE: *To prevent turning, fix the bridge adjust screw with a flathead screwdriver, and tighten the adjust screw nut.*

Tightening torque : **22 N·m** (**16 lb ft**)



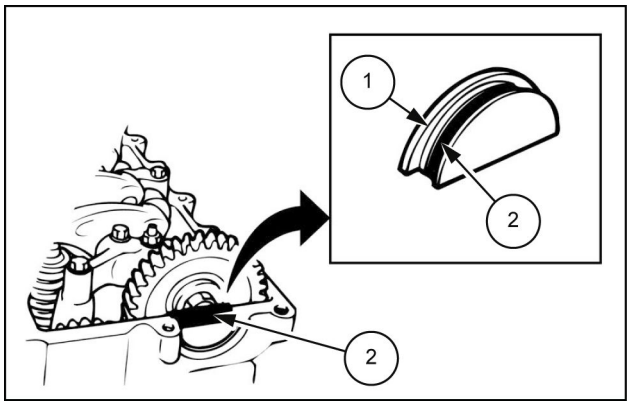
SMIL14CEX3085AA 16

Adjustment table												
Cylinder No.	**1**		**2**		**3**		**4**		**5**		**6**	
Valve	IN	EX	IN	EX	IN	EX	IN	EX	IN	EX	IN	EX
No.1 cylinder compression top dead center (O mark is an adjustable part)	O	O	O			O	O			O		
No.6 cylinder compression top dead center (O mark is an adjustable part)				O	O			O	O		O	O

Lower cover installation

1. Apply the liquid gasket **(2)** to the rubber plug **(1)**.

NOTE: *Apply ThreeBond 1207B.*

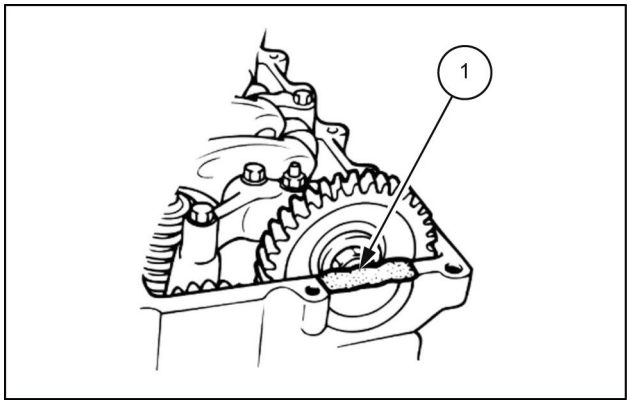


SMIL14CEX3084AB 17

2. Install the rubber plug to the cylinder head.
3. Apply the liquid gasket to the rubber plug in the application area **(1)**.

NOTE: *Apply ThreeBond 1207B to the rubber plug and cylinder head mating surfaces.*

⚠ CAUTION: After applying the liquid gasket, install the lower cover within **5 min**

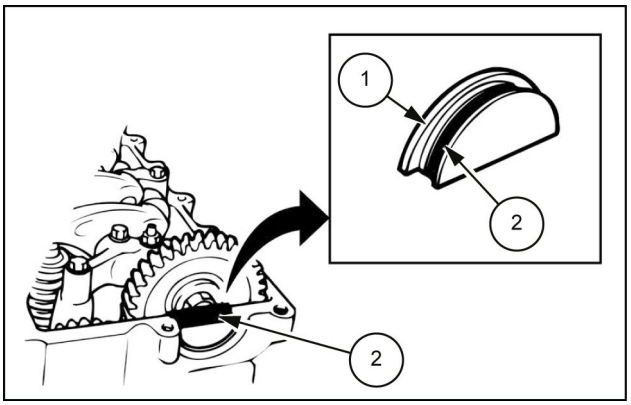


SMIL14CEX3386AB 18

Lower cover installation

1. Apply the liquid gasket **(2)** to the rubber plug **(1)**.

NOTE: *Apply ThreeBond 1207B*



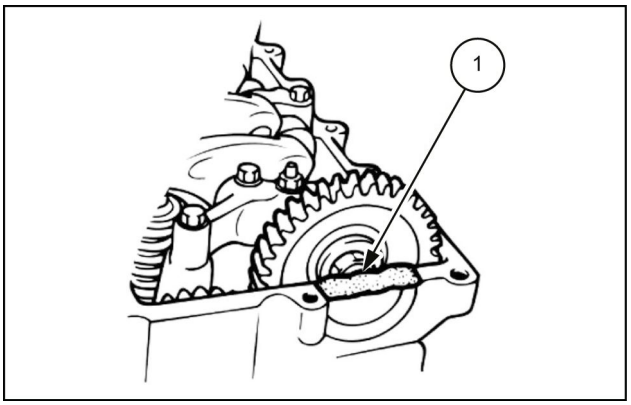
SMIL14CEX3084AB 24

2. Install the rubber plug to the cylinder head.
3. Apply the liquid gasket to the rubber plug in the application area **(1)**.

NOTE: *Apply ThreeBond 1207B to the rubber plug and cylinder head mating surfaces.*

> ⚠ CAUTION: After applying the liquid gasket **(2)**, install the lower cover within **5 min**.

4. Install the gasket to the lower cover.

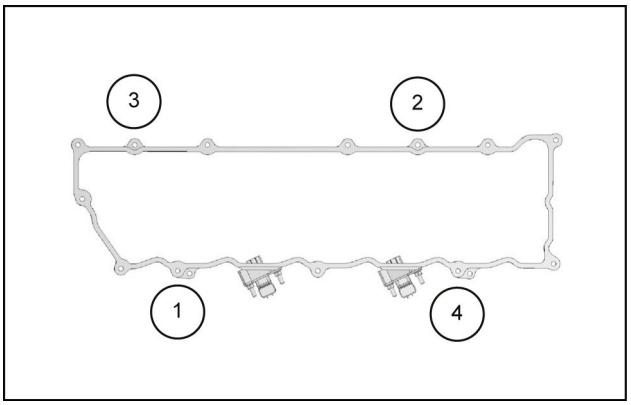


SMIL14CEX3086AB 25

5. Install the lower cover to the cylinder head.

   Tightening torque: **13 N·m** (**112 lb in**)

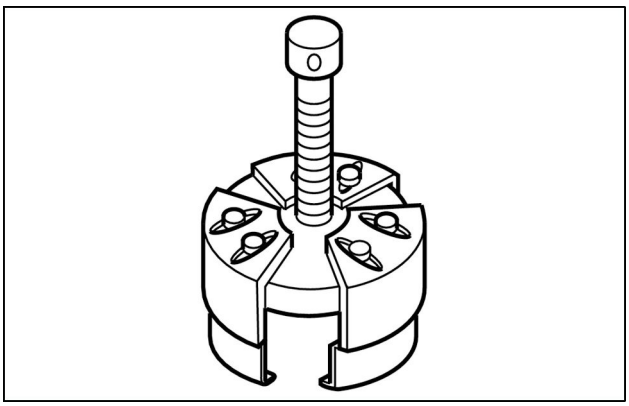
NOTE: *Tightening order*



SMIL14CEX3087AB 26

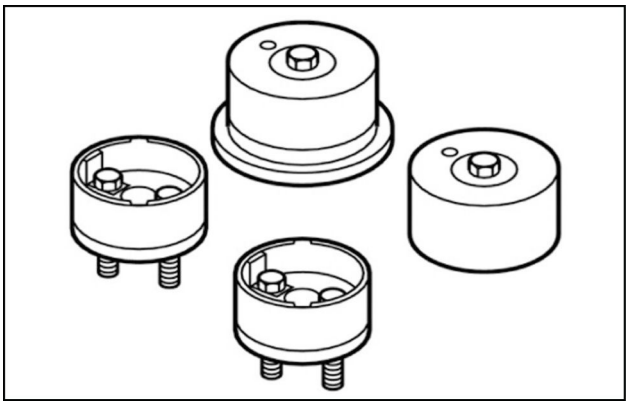
Crankshaft - Special tools

Isuzu reference	CASE CONSTRUCTION tool number	Description
5-8840-2360-0	**380002574**	Slinger puller



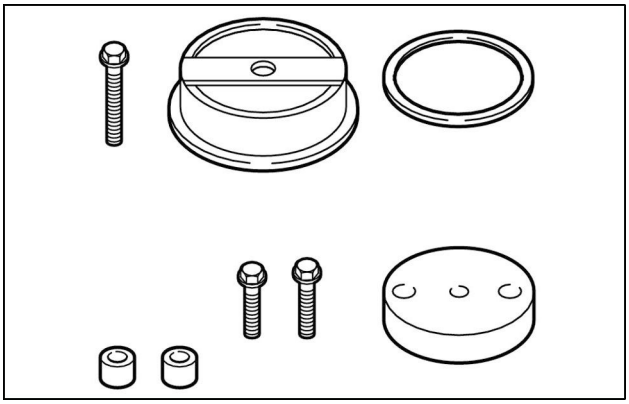
SMIL14CEX2694AA 1

Isuzu reference	CASE CONSTRUCTION tool number	Description
8-9439-6856-0	**380001712**	Oil seal setting tool kit



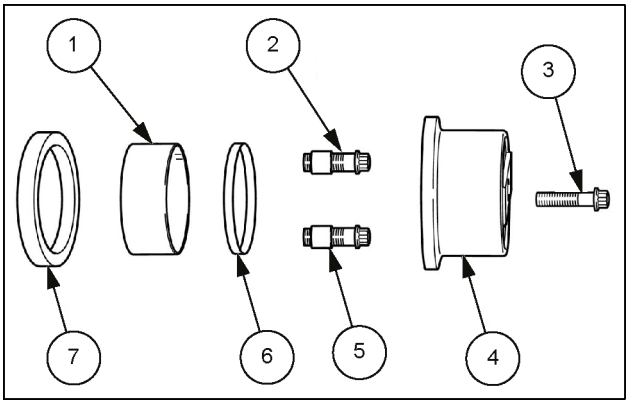
SMIL14CEX3203AA 2

Isuzu reference	CASE CONSTRUCTION tool number	Description
5-8840-9061-0	**380002611**	Oil seal installer



SMIL14CEX2695AA 3

Item	Isuzu reference	Description
1	5–8840–2709–0	Adapter
2	5–8840–2714–0	Adapter tightening bolts
3	5–8840–2713–0	Center bolt
4	5–8840–9063–0	Sleeve
5	5–8840–2710–0	Collar
6	5–8840–2711–0	Adapter ring
7	—	Crankshaft rear oil seal

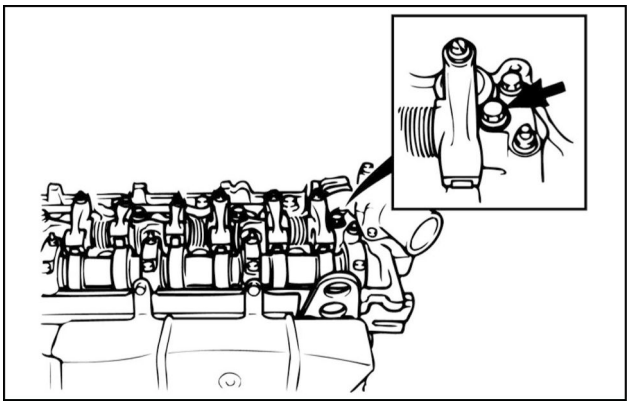


SMIL14CEX2696AA 4

2. Remove the rocker arm shaft from the cylinder head assembly.

NOTE: *Evenly loosen the rocker arm shaft bracket and the rocker arm assembly bracket tightening bolts from both ends and remove them.*

> ⚠ CAUTION: Be careful not to remove the bolt shown in the diagram.

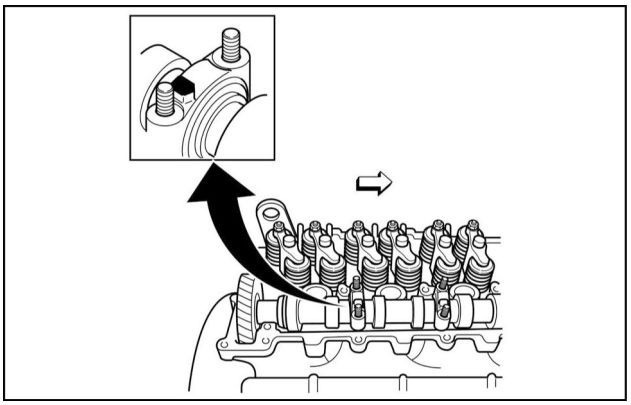


SMIL14CEX3010AA 42

Camshaft removal

1. Remove the camshaft bearing cap from the cylinder head assembly.
2. Remove the camshaft bearing from the camshaft bearing cap.
3. Remove the camshaft from the cylinder head.
4. Remove the camshaft bearing from the cylinder head assembly.

NOTE: *Temporarily assemble the removed caps and bearings in the original position to avoid a mix-up after the bearings have been inspected.*



SMIL14CEX3011AA 43

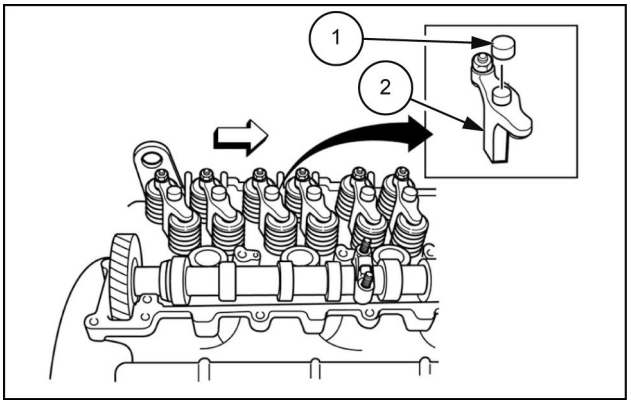
Bridge removal

1. Remove the bridge cap **(1)** from the bridge **(2)**.

> ⚠ CAUTION: Be careful not to drop the bridge cap **(1)** into the engine.

2. Remove the bridge **(2)** from the bridge guide.

NOTE: *After removing, organize to avoid a mix-up with other installation locations.*



SMIL14CEX3012AB 44

Cylinder head assembly removal

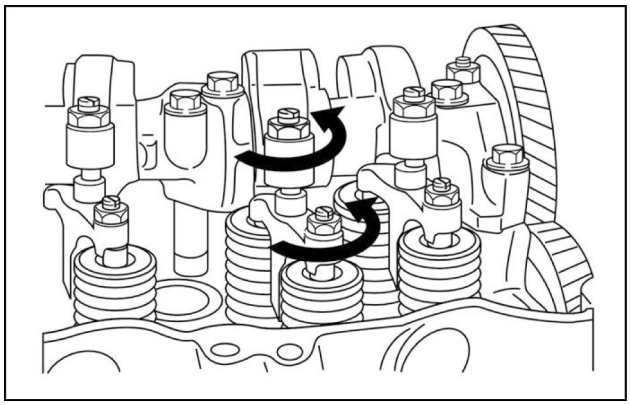
1. Remove the cylinder head assembly from the cylinder block.

NOTE: *Loosening order of the head bolts*

Rocker arm shaft adjustment

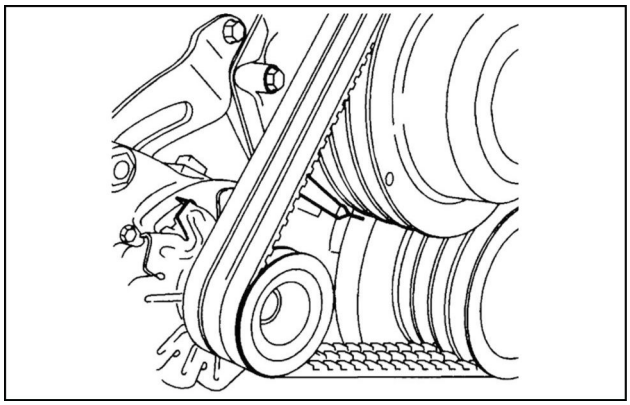
NOTE: *Valve clearance adjustment.*

> ⚠ CAUTION:
>
> - Adjust the valve clearance while cool.
> - Loosen all adjust screws before adjustment.



SMIL14CEX3082AA 71

1. Align No.1 cylinder to the compression top dead center.



SMIL14CEX3075AA 72

2. Prepare the feeler gauge.

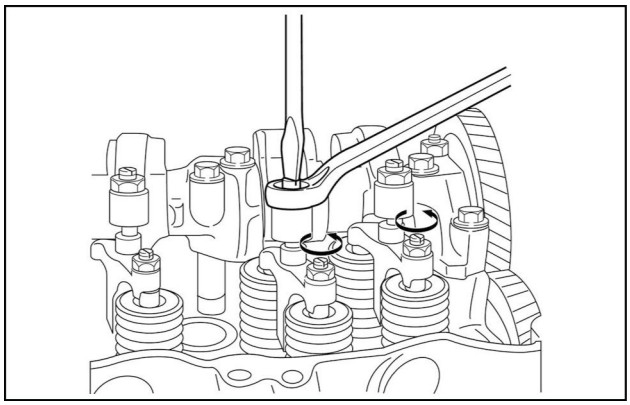
   Thickness: **0.4 mm** (**0.0157 in**)

NOTE: *Insert the thickness gauge between the rocker arm and bridge cap.*

3. Turn the adjust screw.

   Tightening torque: **22 N·m** (**16 lb ft**)

NOTE: *When the movement of the thickness gauge becomes stiff, secure the adjust screw nut of the rocker arm.*

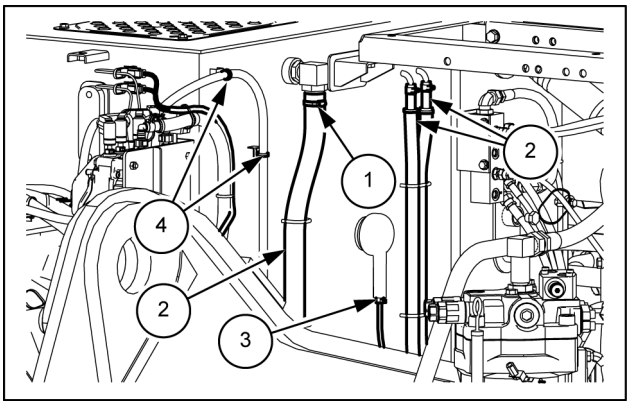


SMIL14CEX3083AA 73

9. Loosen the 3 hose bands **(1)** to disconnect the 3 hoses **(2)**.

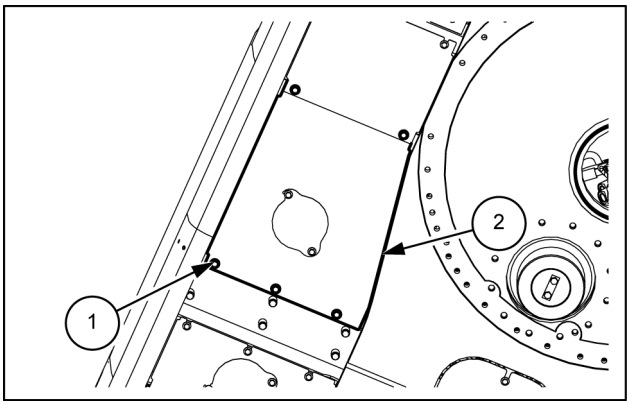
   Disconnect the connector **(3)**.

   - Apply marking at each location of the fuel tank and the hose so as to match connections at assembling.
   - Attach caps and plugs at each location of the fuel tank and hose so as to prevent invasion of water, dust and dirt.



SMIL14CEX1015AB 9

10. Remove the 5 bolts **(1)** to remove the cover **(2)**.

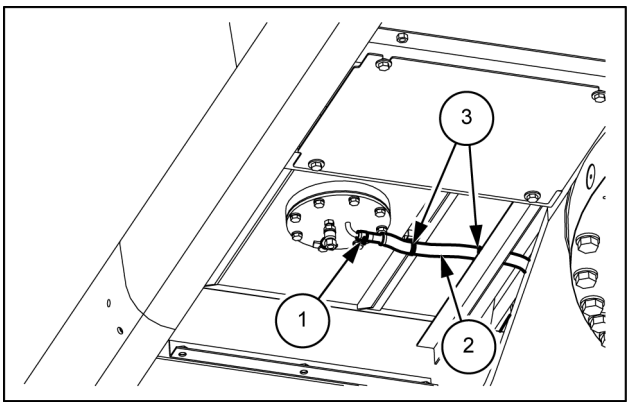


SMIL14CEX1016AB 10

11. Loosen the hose band **(1)** to disconnect the hose **(2)**.

    Remove the 2 hose clamps **(3)**.

    - Apply marking at each location of the fuel tank and the hose so as to match connections at assembling.
    - Attach caps and plugs at each location of the fuel tank and hose so as to prevent invasion of water, dust and dirt.



SMIL14CEX1017AB 11

Fuel injection system - Inspect

The fuel system consists of the fuel tank, fuel filter, supply pump, common rail and injector, and all of these are connected by fuel pipes.

Fuel system inspection

Inspection performed when there is a possibility that there is an abnormality in the fuel system

1. Inspect the fuel quality.
   Appropriate fuel must be used.
2. Check the fuel quantity.
   An adequate amount must be filled.
3. Perform the supply pump fuel discharge inspection.
   The fuel discharge must be normal and air must not be mixed in.
4. Check whether a filter other than a genuine fuel filter, pre-filter, or charge fuel pump has been added to the machine fuel line.

NOTE: *The DTC P0093 may be detected due to the fuel resistance becoming larger because of the added filter.*

5. If a filter has been added, remove it.
6. Inspect the main fuel filter, pre-fuel filter, and charge fuel pump filter.
   - There must be no excessive dirt or clogging.
   - Air must not be mixed in.
7. If a problem is found, clean or replace.
8. Inspect the fuel pipe.
   - There must be no damage, clogging, or improper connection.
9. If a problem is found, perform repair or replacement.
10. Inspect the fuel tank.
    - There must be no dirt or other debris entered in the fuel tank.
    - There must be no disconnected or damaged fuel supply pipe.
    - There must be no crushed or damaged tank.
    - There must be no incorrectly connected fuel pipe.
    - There must be no clogging of the feed port.
    - There must be no water in the tank.
11. If a problem is found, repair or replace the fuel tank.
12. Perform air bleeding.

Contents

Engine - 10

Air cleaners and lines - 202

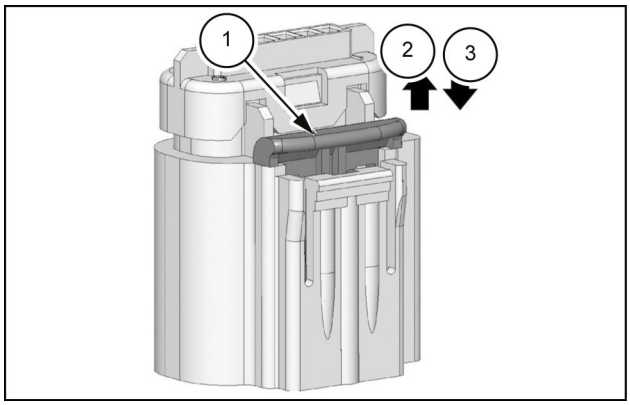
SERVICE

Intake manifold - Remove – Intake throttle valve

1. Remove the air duct from the intake throttle valve.
2. Disconnect the harness connector from the intake throttle valve.

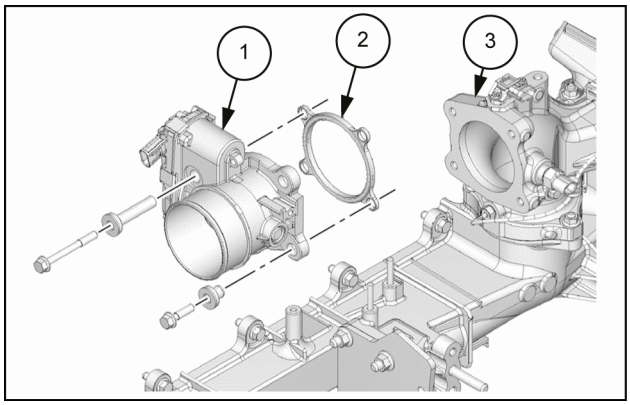
NOTE: *Pull the lock operation portion to release the lock.*

1. Lock operation section
2. Lock release
3. Lock



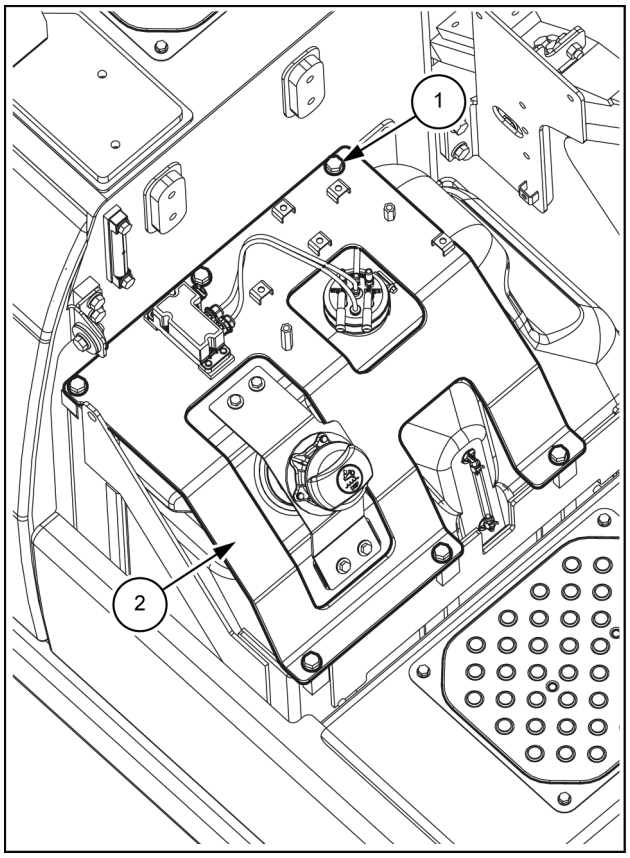
SMIL14CEX2993AB 1

3. Remove the intake throttle valve **(1)** and the gasket **(2)** from the inlet pipe **(3)**.



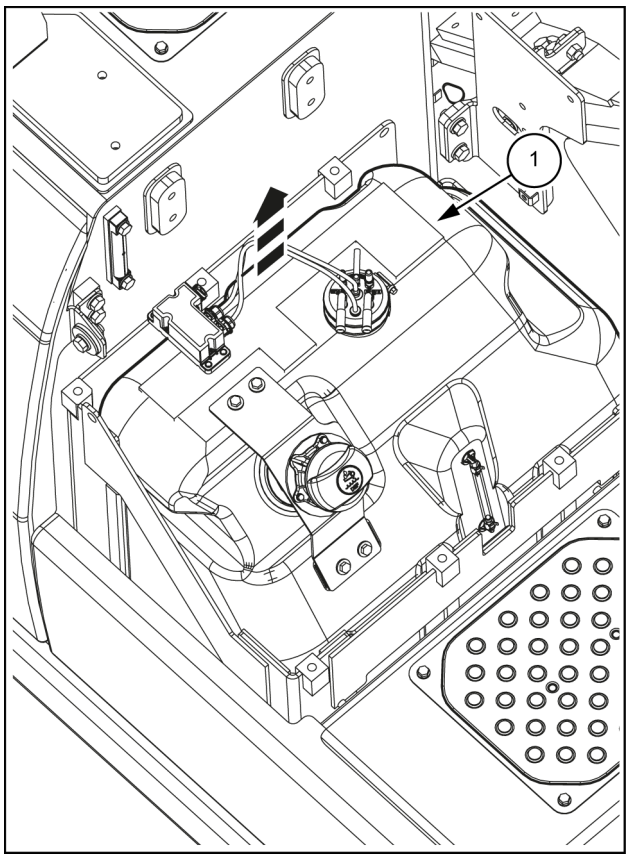
SMIL14CEX2994AB 2

5. Remove the 6 bolts **(1)** with a wrench [**19 mm**] to remove the cover **(2)**.



SMIL14CEX1916BB 4

6. Remove the urea solution tank **(1)**.



SMIL14CEX1917BB 5

Radiator - Prepare

WARNING:

- Do not remove the radiator cap when coolant temperature of the radiator is high. Hot water may burst out.

CAUTION:

- Make sure to release hydraulic pressure before starting work.
- Make sure to stop engine before starting work.
- Make sure to check slinging apparatus such as a wire rope before starting work.
- Never allow any person to enter underneath a slung load.

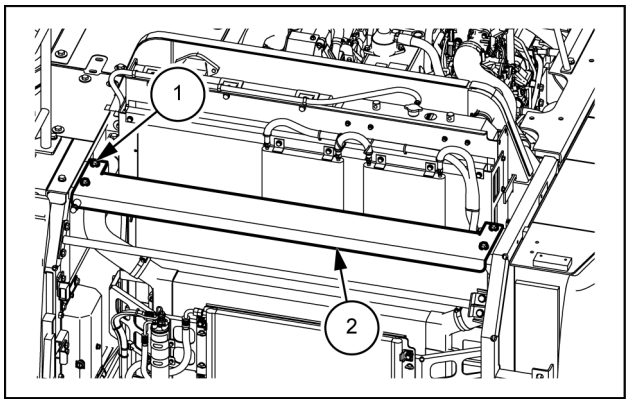
Items to prepare:

- Wrenches [**7 mm**, **13 mm**, **19 mm**]
- Pliers
- Shackle (that fulfills slinging capacity) x 2
- Wire rope (that fulfills breaking load)
- Liftcrane (that fulfills slinging capacity)
- Cap
- Plug
- Reservoir for drainage
- Hose for drainage
- Rag
- Cleaning fluid
- Wood plank

Aftercooler - Remove

1. Open the backward left door and the engine hood.

   Remove the 4 bolts **(1)** with a wrench [**19 mm**] to remove the house frame **(2)**.

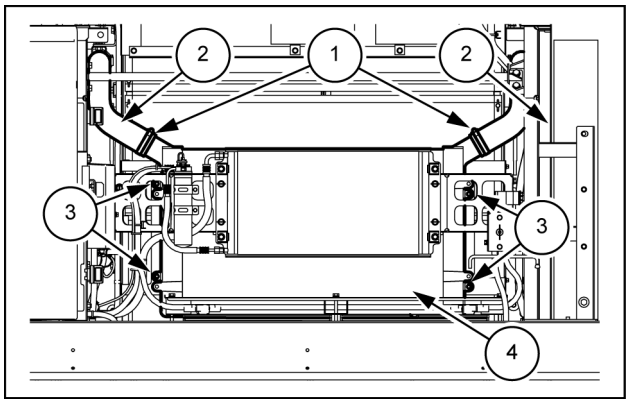


SMIL14CEX0781AB 1

2. Remove the 2 hose clamps **(1)** to remove the 2 intercooler hoses **(2)**.

   Remove the 4 nuts **(3)** with a wrench [**13 mm**] to remove the intercooler **(4)**.

   - Attach caps at intercooler and each location so as to prevent invasion of water, dust and dirt.

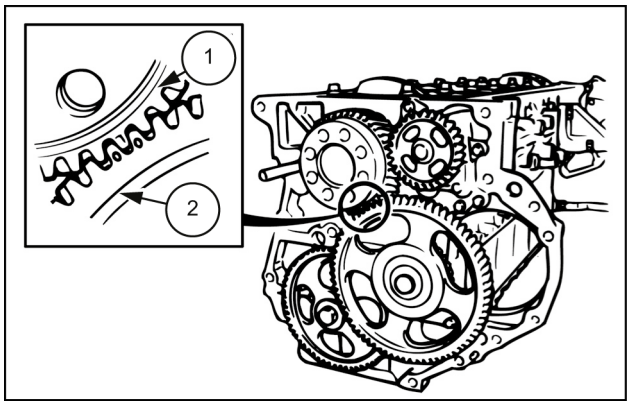


SMIL14CEX0782AB 2

Idle gear A installation

1. Align No.1 cylinder to the compression top dead center.
2. Apply the engine oil to the idle gear A shaft.
3. Apply the engine oil to the idle gear A.
4. Install the idle gear A shaft to the idle gear A.
5. Align the idle gear A to alignment mark.

NOTE: *Align the L mark **(1)** on the crank gear with the O mark **(2)** on the idle gear A.*

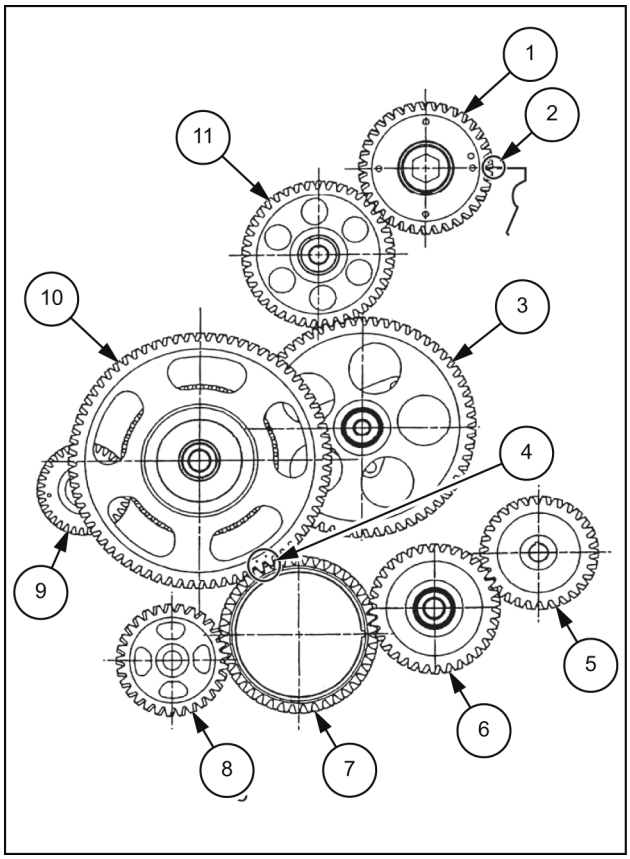


SMIL14CEX3175AB 4

6. Install the idle gear A to the cylinder block.

   Tightening torque: **133 N·m** (**98 lb ft**)

   1. Camshaft gear
   2. Aligning position
   3. Idle gear B
   4. Aligning position
   5. PTO gear
   6. PTO idle gear
   7. Crank gear
   8. Oil pump gear
   9. Supply pump gear
   10. Idle gear A
   11. Idle gear C



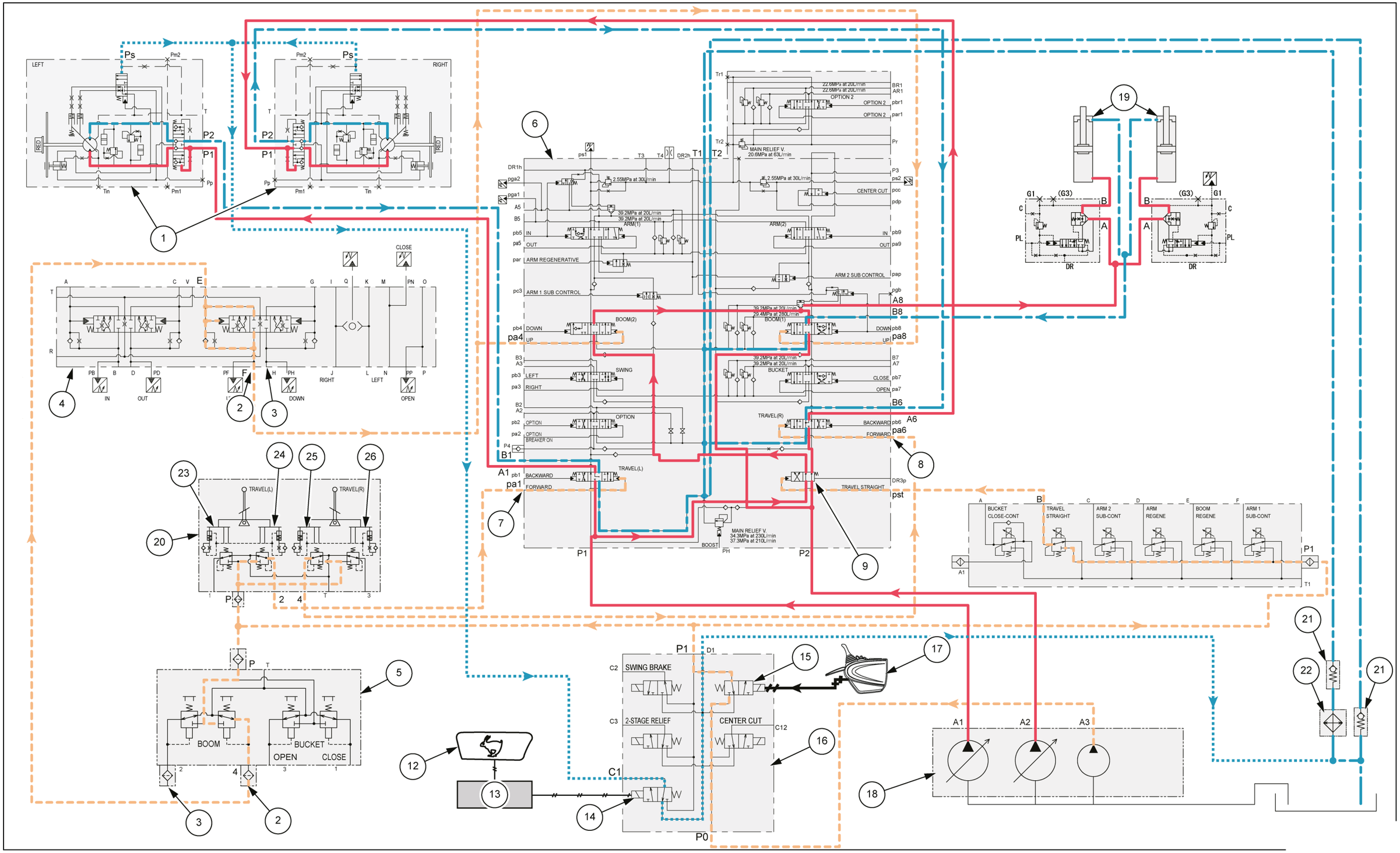
SMIL14CEX3176BB 5

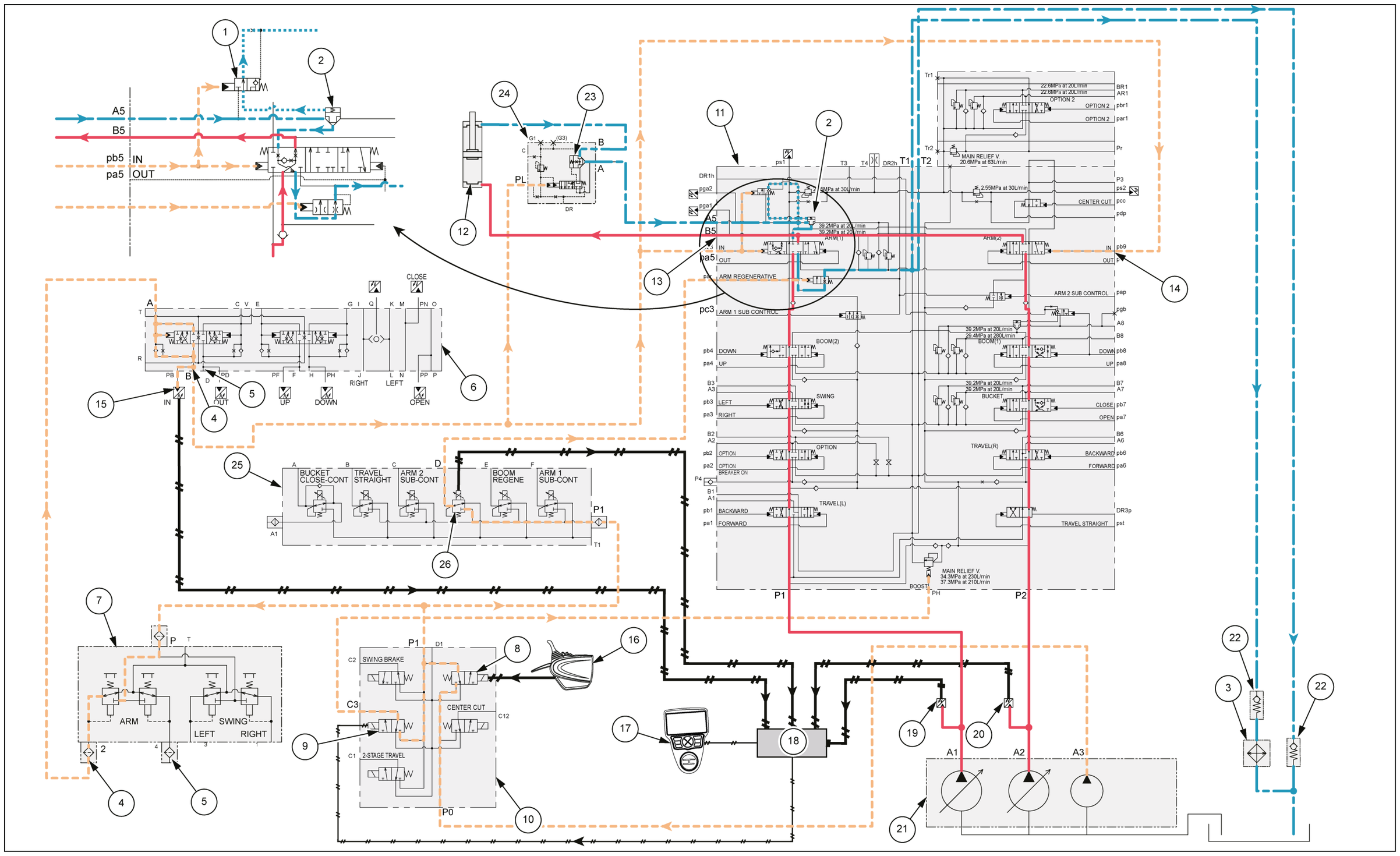
Contents

Engine - 10

Oil cooler and lines - 408

SERVICE


LEFT
RIGHT
Ps
Pm2
Pm1
Pp
Tin
P1
P2
T
RED
1
CLOSE
A
C
V
E
G
I
Q
K
M
PN
O
R
PB
B
D
PD
PF
F
H
PH
J
RIGHT
L
N
LEFT
PP
P
IN
OUT
DOWN
OPEN
2
3
4
6
DR1h
pga2
pga1
A5
B5
pb5
IN
pa5
OUT
par
ARM REGENERATIVE
pc3
ARM 1 SUB CONTROL
pb4
DOWN
pa4
UP
B3
A3
pb3
LEFT
pa3
RIGHT
B2
A2
pb2
OPTION
pa2
OPTION
BREAKER ON
P4
B1
A1
pb1
BACKWARD
pa1
FORWARD
ps1
T3
T4
DR2h
T1
T2
2.55MPa at 30L/min
39.2MPa at 20L/min
ARM(1)
BOOM(2)
SWING
OPTION
TRAVEL(L)
MAIN RELIEF V.
34.3MPa at 230L/min
37.3MPa at 210L/min
BOOST
PH
7
Tr1
Tr2
22.6MPa at 20L/min
OPTION 2
BR1
AR1
pbr1
par1
Pr
MAIN RELIEF V.
20.6MPa at 63L/min
P3
ps2
CENTER CUT
pcc
pdp
ARM(2)
pb9
pa9
pap
ARM 2 SUB CONTROL
pgb
A8
B8
29.4MPa at 28L/min
BOOM(1)
pb8
pa8
B7
A7
BUCKET
CLOSE
pb7
OPEN
pa7
B6
A6
TRAVEL(R)
pb6
BACKWARD
pa6
FORWARD
8
DR3p
pst
TRAVEL STRAIGHT
9
19
G1
(G3)
B
C
PL
A
DR
20
23
24
25
26
1
2
4
T
3
5
BOOM
BUCKET
OPEN
CLOSE
12
13
14
P0
C1
C2
SWING BRAKE
C3
2-STAGE RELIEF
D1
C12
15
16
17
18
A1
A2
A3
21
22
BUCKET CLOSE-CONT
TRAVEL STRAIGHT
ARM 2 SUB-CONT
ARM REGENE
BOOM REGENE
ARM 1 SUB-CONT


A5
B5
pb5 IN
pa5 OUT
PL
G1
(G3)
C
B
A
DR
DR1h
pga2
pga1
ps1
T3
T4
DR2h
T1
T2
2.5MPa at 30L/min
39.2MPa at 20L/min
39.2MPa at 20L/min
ARM(1)
ARM REGENERATIVE
pc3
ARM 1 SUB CONTROL
Tr1
22.6MPa at 20L/min
22.6MPa at 20L/min
OPTION 2
BR1
AR1
pbr1
par1
Tr2
MAIN RELIEF V.
20.6MPa at 63L/min
Pr
P3
ps2
2.55MPa at 30L/min
CENTER CUT
pcc
pdp
ARM(2)
pb9
pa9
ARM 2 SUB CONTROL
pap
pgb
A8
B8
39.2MPa at 20L/min
29.4MPa at 280L/min
BOOM(1)
BOOM(2)
pb4 DOWN
pa4 UP
pb8
pa8
B3
A3
39.2MPa at 20L/min
39.2MPa at 20L/min
BUCKET
B7
A7
pb3 LEFT
pa3 RIGHT
SWING
pb7 CLOSE
pa7 OPEN
B2
A2
B6
A6
pb2 OPTION
pa2 OPTION
BREAKER ON
OPTION
TRAVEL(R)
pb6 BACKWARD
pa6 FORWARD
P4
B1
A1
pb1 BACKWARD
pa1 FORWARD
TRAVEL(L)
DR3p
pst
TRAVEL STRAIGHT
MAIN RELIEF V.
34.3MPa at 230L/min
37.3MPa at 210L/min
BOOST
PH
P1
P2
A
T
R
C V E
G I Q
K M
PN O
PB B PD
PF F
H PH
J RIGHT
L N LEFT
PP P
D
IN
OUT
UP
DOWN
OPEN
CLOSE
A
B
C
D
E
F
BUCKET CLOSE-CONT
TRAVEL STRAIGHT
ARM 2 SUB-CONT
BOOM REGENE
ARM 1 SUB-CONT
P1
A1
T1
P
T
ARM
SWING
LEFT
RIGHT
2
4
3
P1
D1
C2 SWING BRAKE
C3
CENTER CUT
C12
C1 2-STAGE TRAVEL
P0
A1
A2
A3
1
2
3
4
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SWING BALL RACE BEARING MOVEMENT AMOUNT AND BUCKET TIP MOVEMENT AMOUNT

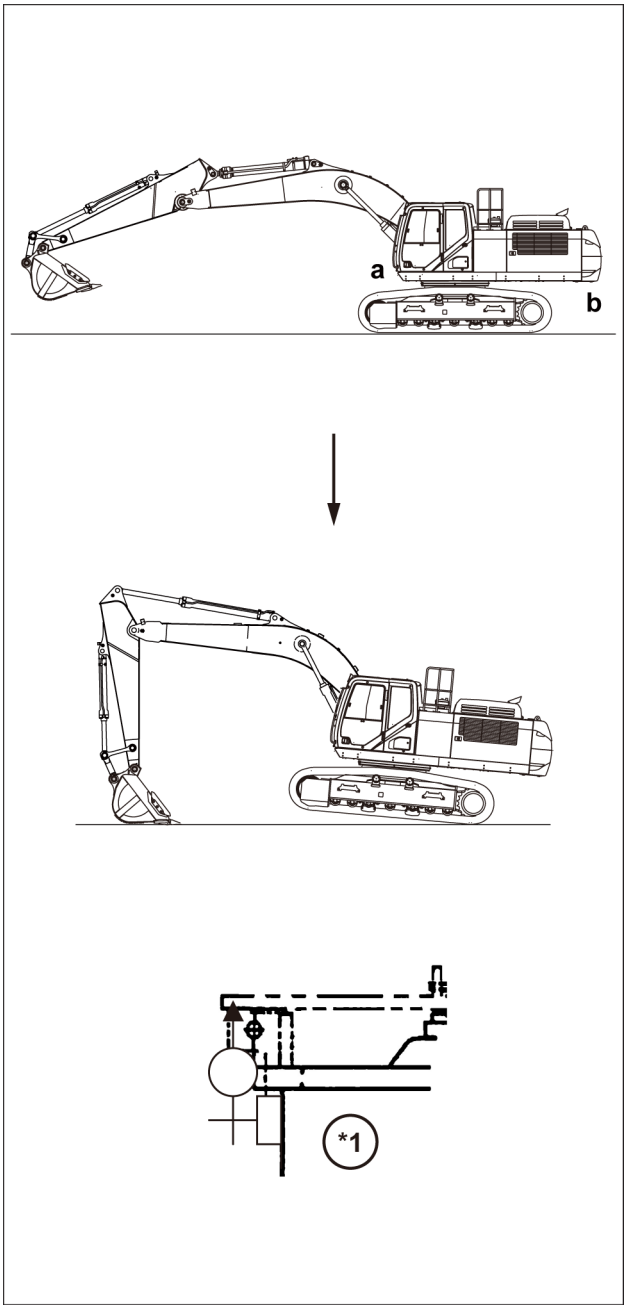
Measurement method in a vertical direction

1. Measure the vertical movement amount at the front and back of the ball race (two locations).
2. With the arm cylinder out and the bucket cylinder closed, raise the bucket bottom **30 cm** (**11.81 in**) off the ground and perform 0-point adjustment with the dial gauge attached at the lowering part as shown in the following figure.
3. Jack up the main unit and measure the movement amount on the dial gauge.
   * Jack up the main unit until oscillation of the dial gauge becomes stable.

   (a) Front

   (b) Rear

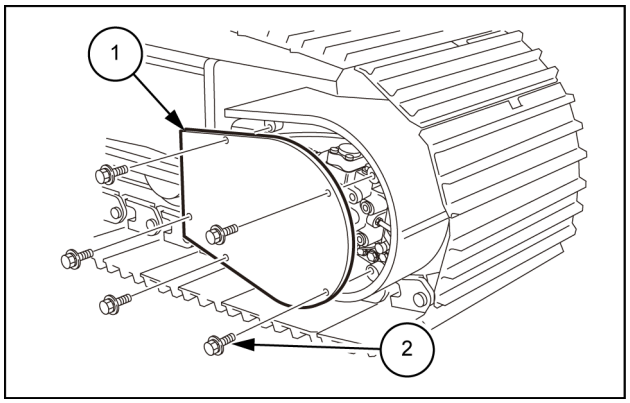
   (*1) Lowering



SMIL14CEX6653CB 13

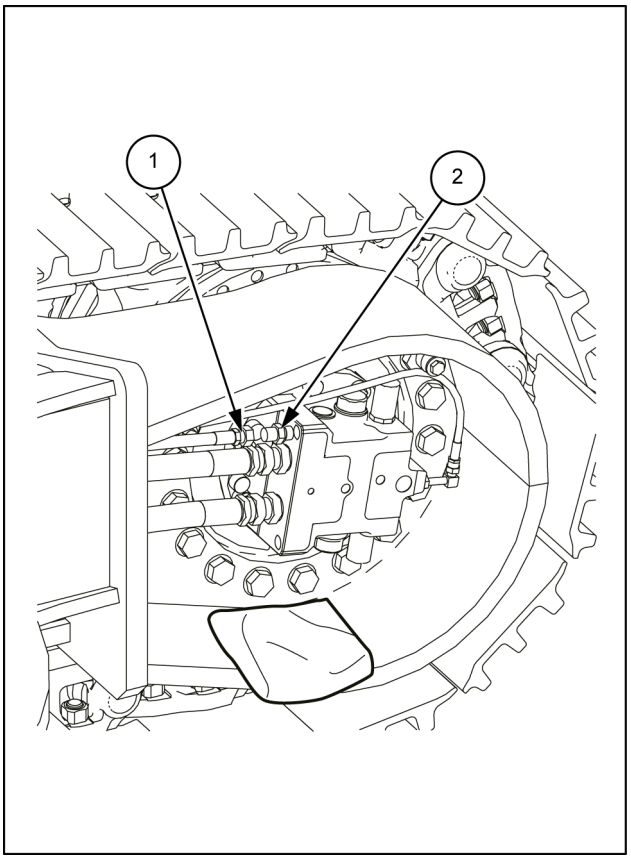
Travel motor

1. Remove the bolts **(2)**, then remove the cover **(1)**.



SMIL14CEX2123AB 2

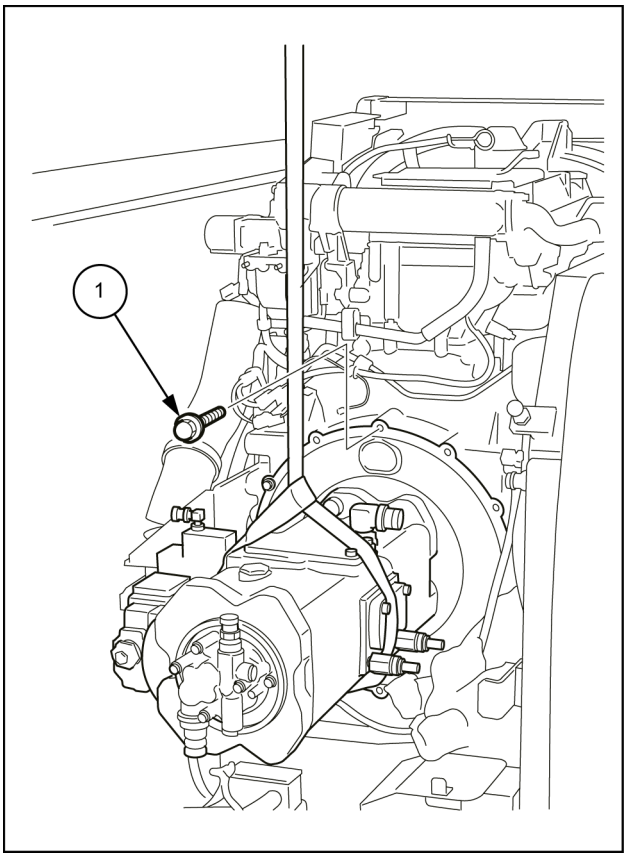
2. Remove the drain port hose **(1)** and the hose adapter **(2)**.



SMIL14CEX2133BB 3

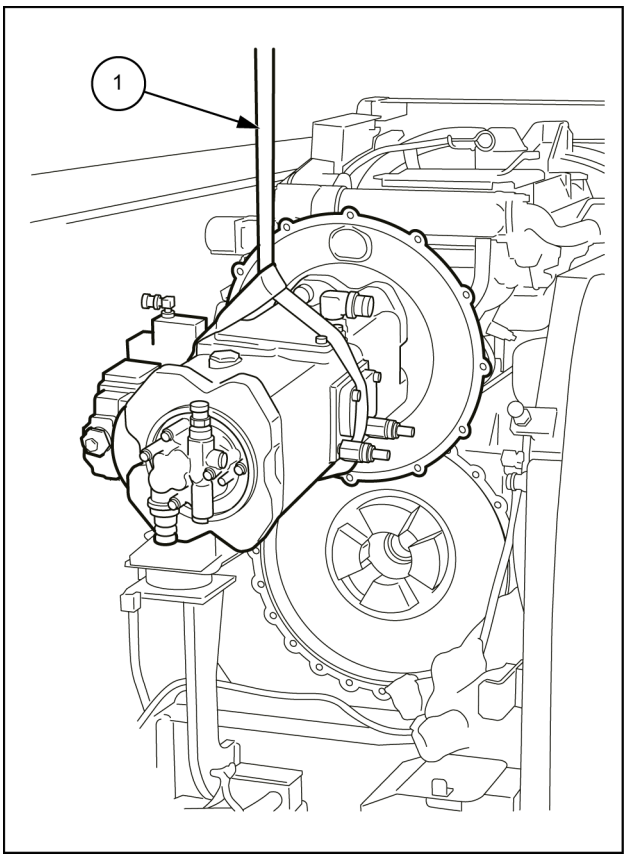
12. Remove the 12 bolts **(1)** of the pump with a wrench [**17 mm**].

    Bolt tightening torque: **63.8 - 73.6 N·m** (**47.056 - 54.285 lb ft**).



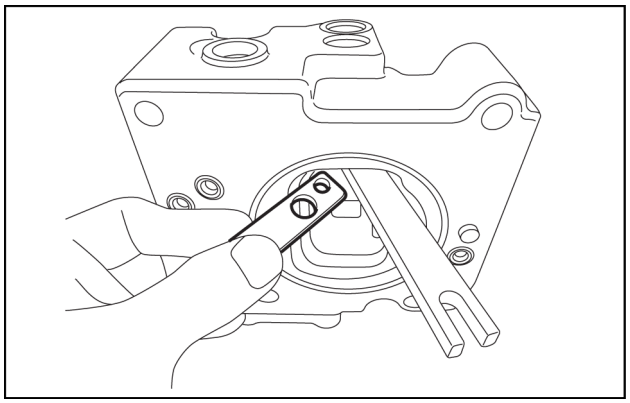
SMIL14CEX1323BB 10

13. Pull out the pump outward in axial direction with a liftcrane and nylon sling **(1)** and then lift the pump.



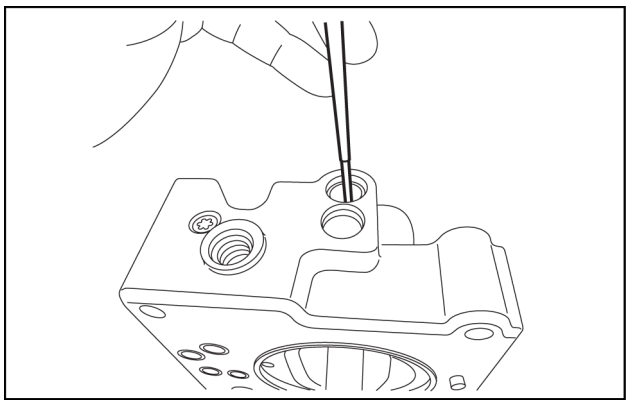
SMIL14CEX1324BB 11

8. Remove the lever **(2) (613)**. Do not remove the pin **(875)**.
   - To facilitate work, you are recommended to use tweezers.

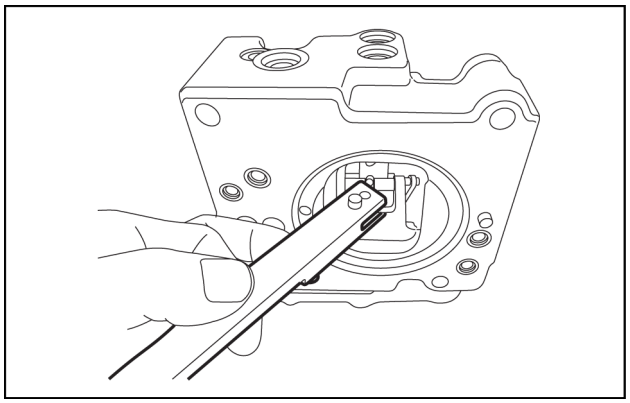


SMIL14CEX2206AA 8

9. Remove the pin **(874)** to remove the feedback lever **(611)**.
   - The pin **(874)** (pin diameter: φ4) should be pushed out from above with a thin steel rod so as not to interfere with the lever **(1) (612)**.

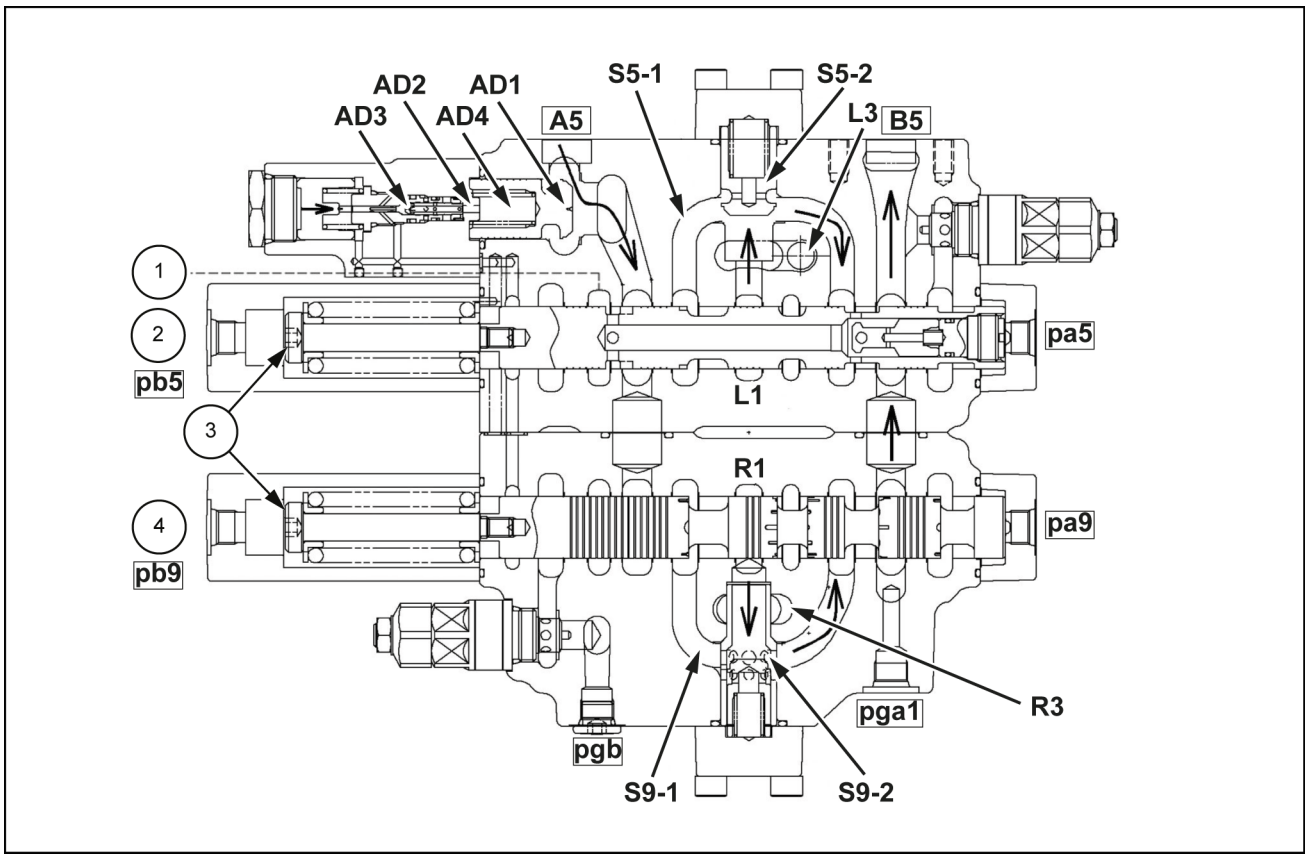


SMIL14CEX2207AA 9



SMIL14CEX2208AA 10

10. Remove the lever **(1) (612)**. Do not remove the pin **(875)**.
11. Remove the pilot piston **(643)** and the spool **(652)**.
12. Remove the piston case **(622)**, the compensation piston **(621)**, and the compensation rod **(623)**.
    - The piston case **(622)** can be removed by pushing out the compensation rod **(623)** from the opposite side of the piston case **(622)**.



SMIL14CEX3817FB 15

1. To regeneration control valve
2. Arm 1 (section 5)
3. Switchover state
4. Arm 2 (section 9)

c. Arm in (regeneration release) [Fig. 16]

During operation of arm in, after returning oil from the A5 port passes through a notch of **(a)**, it is divided into the following two types of flows:

1. Returning to the tank path **(Ta)** passing through a notch of **(d)** of the regeneration control valve.
2. Merging in the bridge path (S5-1) after passing through **(b)** fixed orifice, **(c)** regeneration check and **(i)** fixed orifice in the arm 1 spool.

Pressurizing the par port at this moment activates the arm regeneration release valve **(e)**, and then increases the notch opening area of **(d)** to increase the amount of oil returning to the tank path **(Ta)**.

On the other hand, the amount of oil regenerating to the B5 port decreases.

This mechanism enables both of ensuring the regeneration ratio at low load and reducing the returning back pressure at high load at the same time.

Stacked control valves - Disassemble

Caution for disassembly

1. The main unit shall be kept in level on level site and all of the working system shall be grounded.
   Travel and swing shall be thoroughly confirmed to be in condition that they will not activated by themselves.
   Then, stop the engine and release pressure from each actuator.

   > ⚠ CAUTION:
   >
   > - Replacing the valve assembly or disassembling the valve with pressurized condition is dangerous due to possible bursting out of a high pressure oil or abrupt drop off of components.
   > - The bucket shall be grounded before disassembling and pressure in the circuit shall be released.

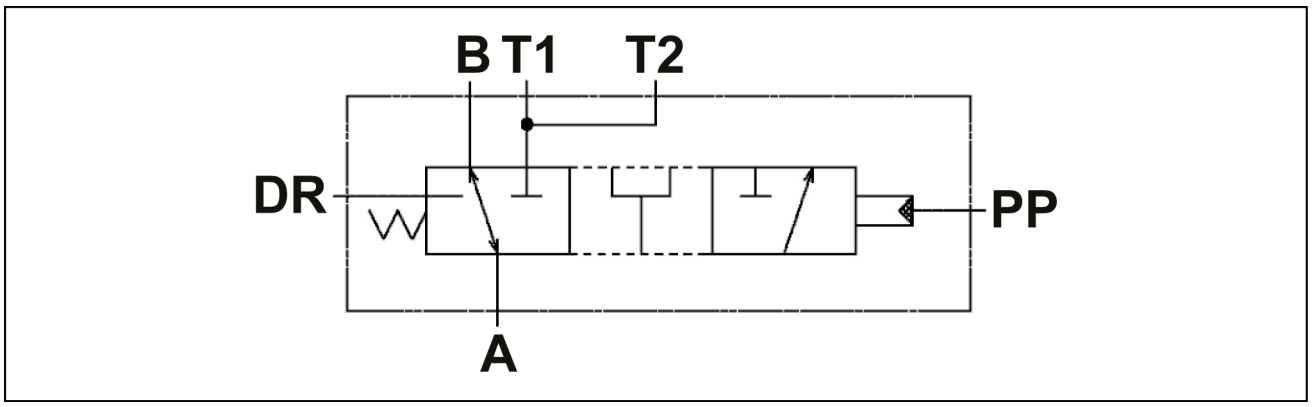
2. Air pressure inside the tank shall be released.
3. Surrounding area of the portion to be disassembled shall be thoroughly cleaned to prevent invasion of foreign substances into the valve during disassembling.
4. Disassembled component shall be identified by tags to identify position to be re-assembled to.
5. All of the disassembled seals (O-rings and backup rings) shall be replaced with new ones.
6. The spool shall not be replaced since it is selected and fitted to the valve housing and the sleeve.

Removal of long cap and pulling out of main spool

1. Loosen and remove the cap **(8)** and the socket head bolt **(62)** (hexagon socket diameter **8 mm**) of the cap **(9)**.
2. Remove the O-ring **(7)** from the valve housing.
3. Pull out each spool from the valve housing in state of sub-assembly.

   > ⚠ CAUTION:
   >
   > - Pay attention not to create hit mark or scratch during pulling out the spool.
   > - Disassembled spool shall be identified by tags so as to be re-assembled to the right position.

4. Disassembling spool assembly.



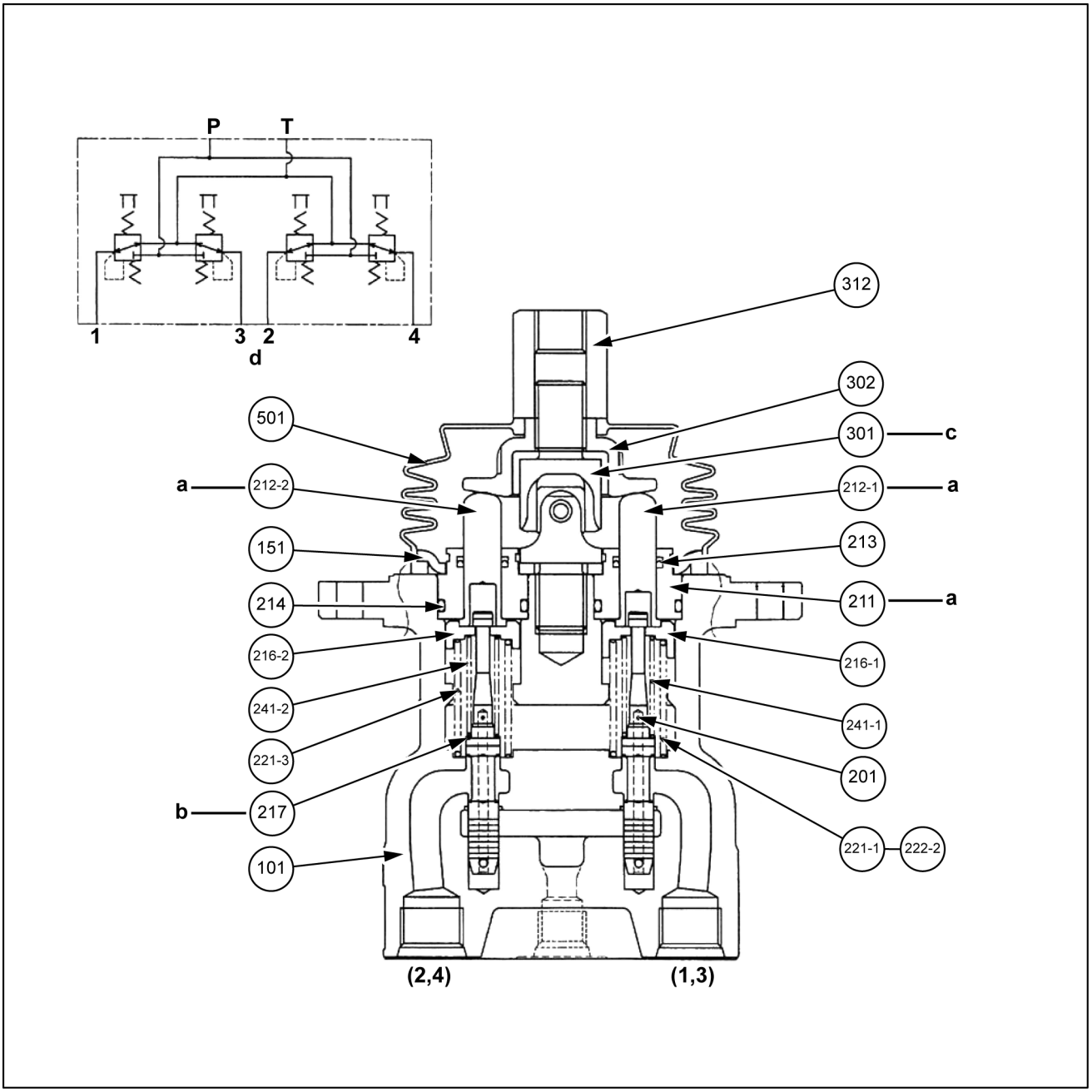
SMIL14CEX3867EA 2

Circuit diagram

1. Cover
2. Name plate
3. Spool
4. Spring
5. Body
6. Cover
7. Spring
8. Hexagon socket head bolt
9. Hexagon socket head bolt
10. Hexagon socket head bolt
11. Rivet screw
12. O-ring

Hand control valve - Sectional view

Assembly cross-section diagram



SMIL14CEX1446GB 1

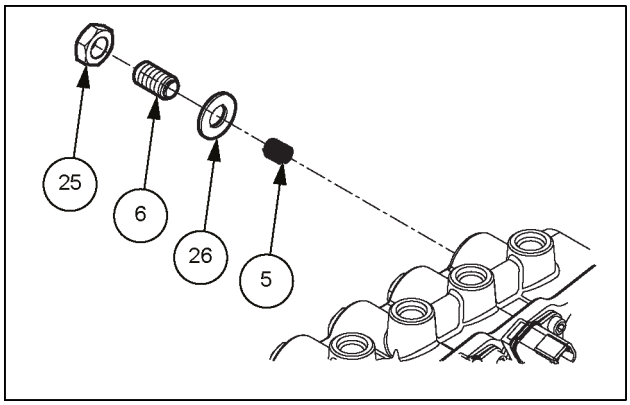
a. Grease application to top

b. Secondary pressure adjustment shim. Design central value t = **0.4 mm** (**0.0157 in**), 1 shim

c. Grease application to rotating sliding sections. Be careful with the installation direction.

d. Hydraulic symbols

Remove the spring.
S1: Spring **(O) (4)**
S2 to S6: Spring **(C) (5)**



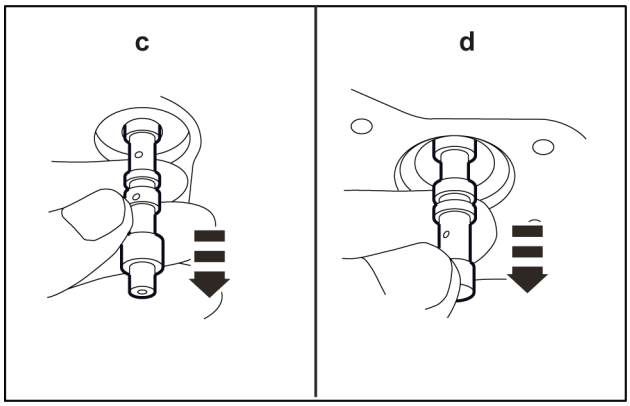
SMIL14CEX2013AB 4

2. Remove the spool.
   - For normally open (S1)

     Pull out the spool **(O) (2)** from a hole for the adjusting screw of the body **(1)**.
   - For normally closed (S2 to S6)

     Pull out the spool **(C) (3)** from the sleeve **(C) (12)**.

     c. Normally open (S1)
     d. Normally closed (S2 to S6)

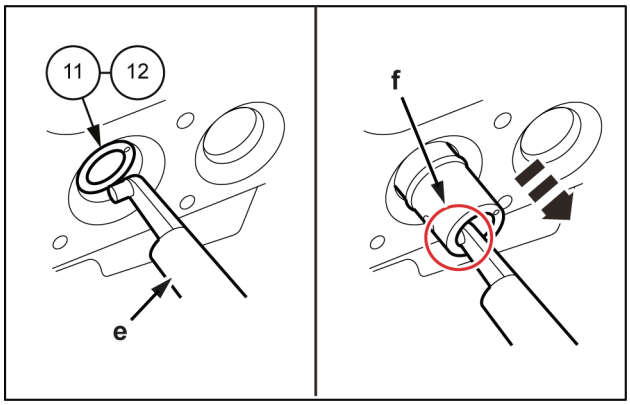


SMIL14CEX3720AA 5

3. Remove the sleeve.

   Pull out the sleeve from the body **(1)** using a jig for removing sleeve.
   - Remove the sleeve **(O)**, **(C)** in the same manner.
   - Pay attention not to damage the body during removing the sleeve.
   - Remove the sleeve paying attention not to damage the inner surface of the sleeve by the jig.
   - Check for any harmful damage or crack inside and control edge when reusing the sleeve.

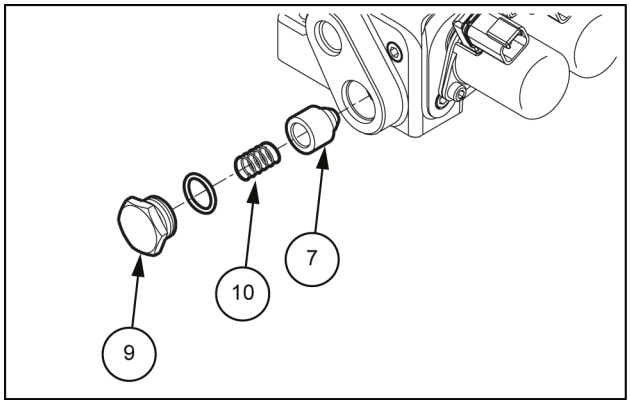
     e. Jig
     f. Pull out the sleeve by hooking on its port hole.



SMIL14CEX3721AB 6

Poppet (Check valve for normally open)

1. Loosen the plug **(9)** to remove the poppet **(7)** and the spring **(10)**.



SMIL14CEX3727AB 7

214. Push rod (Quantity 4)
217. Washer 2 (Quantity 4)
218. Spring seat (Quantity 4)
220. Hexagon socket head bolt (Quantity 2)
224. Piston 2D085 (Quantity 4)
423. Hexagon socket head retaining screw (Quantity 2)
471. Retaining screw (Quantity 4)
472. Lock nut (Quantity 4)
501. Bellows (Quantity 2)

A. Apply grease to the top

B. Fill grease cup with grease

NOTE: *Since hydraulic equipment is crucial to safety, we cannot guarantee performance and functions if disassembly and reassembly are performed.*

Tightening torque list

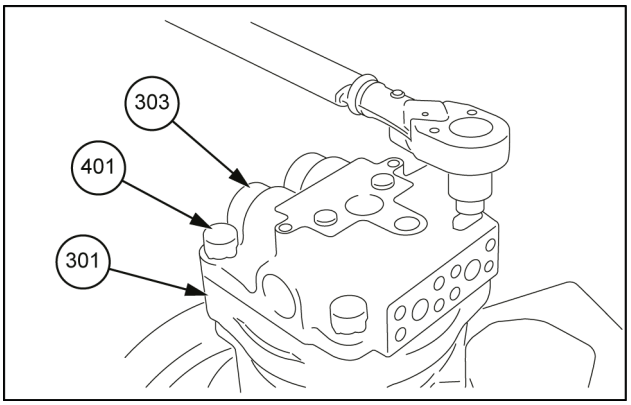
Code	Screw size	Tightening torque
220	**M6**	**7.8 - 9.8 N·m** (**5.753 - 7.228 lb ft**)
271	**M12**	**45.2 - 64.8 N·m** (**33.338 - 47.794 lb ft**)
423	**M6**	**5.9 - 7.9 N·m** (**4.352 - 5.827 lb ft**) (**LOCTITE®** coating)
472	**M10**	**29.9 - 36.7 N·m** (**22.053 - 27.069 lb ft**)

Hydraulic systems - 35

Hydraulic swing system - 352

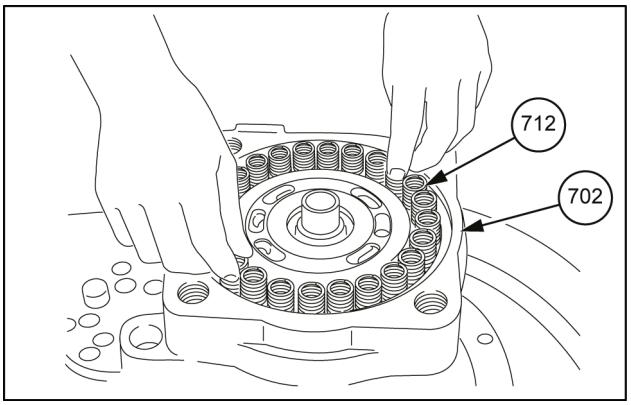
CX350D Crawler excavators LC version (TIER4 FINAL) - NA Market

7. Remove valve plate B **(131)** from valve casing H0 **(303)**.
   - Do this carefully so as not to let valve plate B **(131)** fall from valve casing H0 **(303)**. (Valve plate B **(131)** may be attached to the cylinder side.)
   - When prying open the matching surface with a screwdriver, be careful not to scratch the surface.



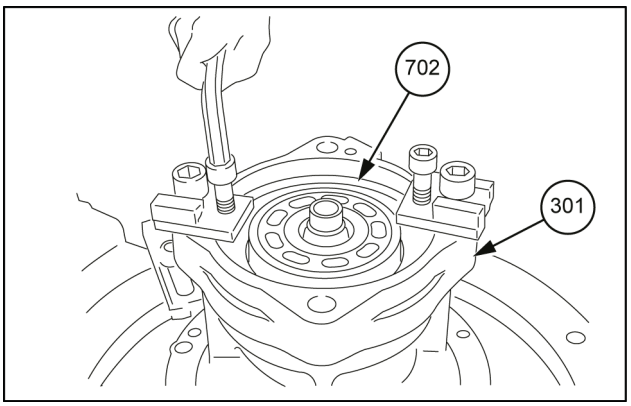
SMIL14CEX3738AB 4

8. Take out the brake springs **(712)** from the brake piston **(702)**.



SMIL14CEX3739AB 5

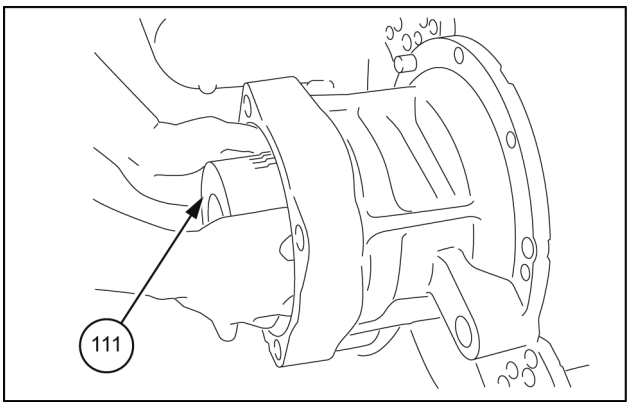
9. Use a jig and remove the brake piston **(702)** from casing JA1 **(301)**.
   - Apply the tips of the jig to the grooves of the brake piston, and pull straight up.



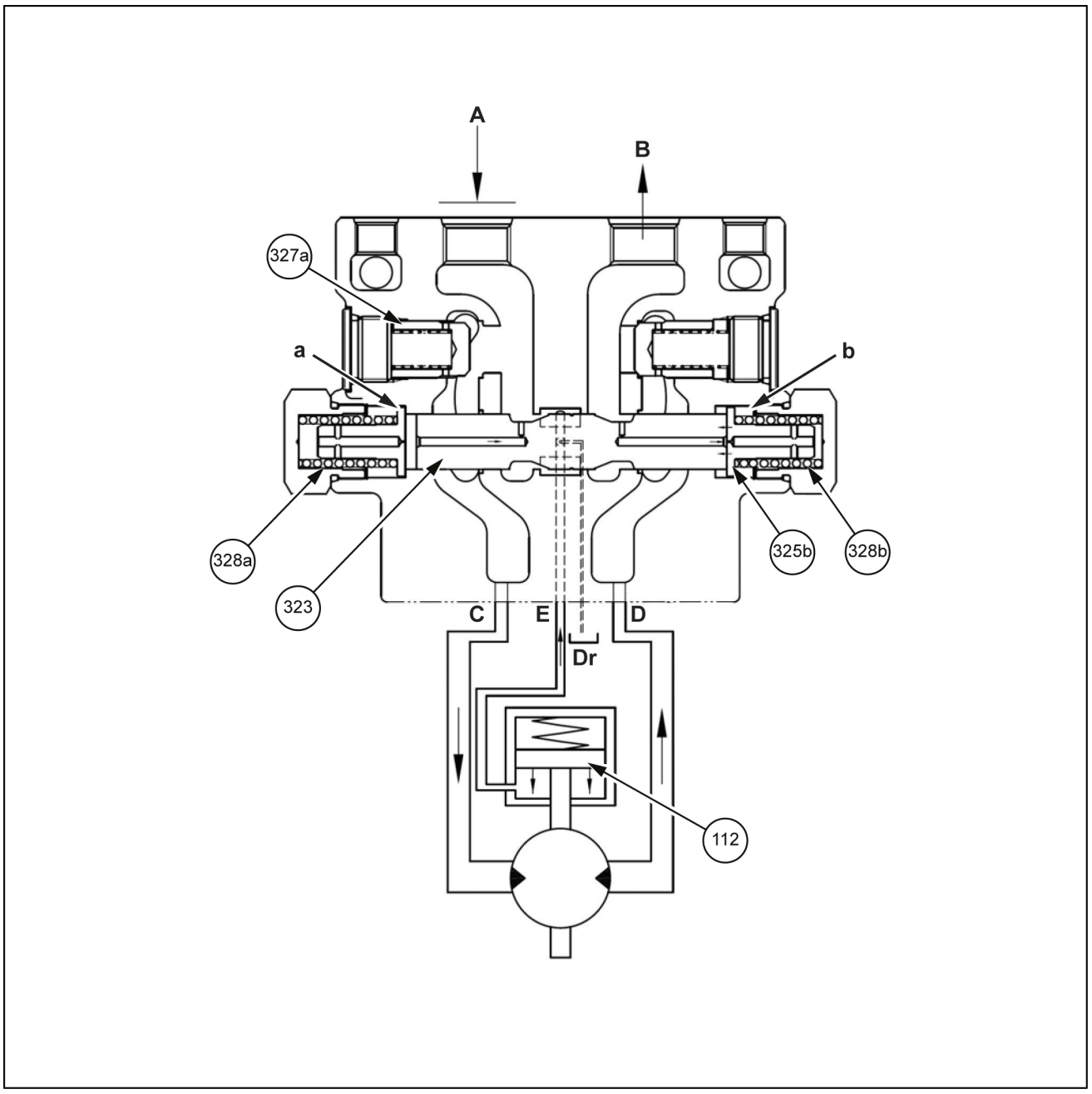
SMIL14CEX3740AB 6

10. Reposition the motor on its side, and remove the cylinder **(111)** from the drive shaft.

    Next, remove the pistons **(121)**, holder plate **(123)**, plate spring **(114)**, and shoe plate **(124)**.
    - Be careful not to scratch the sliding surfaces of the cylinder **(111)**, shoe **(122)**, etc.



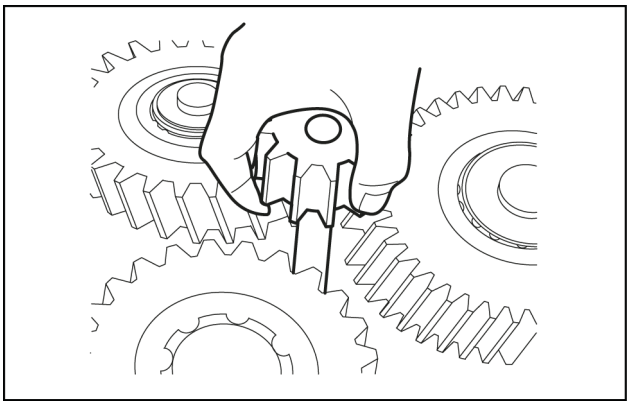
SMIL14CEX3741AB 7



SMIL14CEX3942GB 4

112.	Brake piston	328a.	Spring
323.	Spool	325b.	Spring retainer
327a.	Valve	328b.	Spring

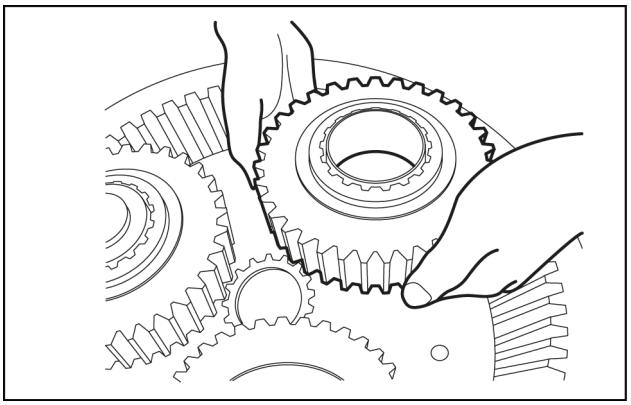
2. Remove the steel ball **(36)** from the sun gears **(1)** and **(4)**.
   Use a magnet if it is hard to remove the steel ball **(36)**.



SMIL14CEX3303AA 4

7. Removal of 1st-stage gears

1. Remove the planetary gears **(1)** and **(5)** (3 pieces).
2. Remove the needle pin roller bearings with retainer **(27)** (3 pieces).
3. Remove the inner rings **(29)** (3 pieces).
4. Remove the thrust washers **(1)** and **(11)** (3 pieces).

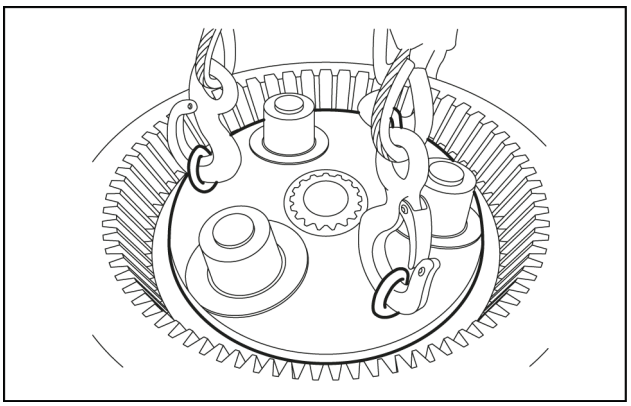


SMIL14CEX3304AA 5

8. Removal of carrier (1)

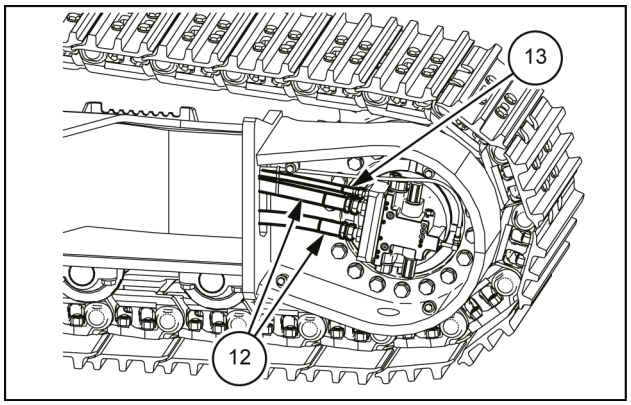
1. Attach 3 eyebolts **(M10)** to the carriers **(1)** and **(3)**, and lift them with a liftcrane.

> ⚠ CAUTION: If you attempt to remove it holding the pillars of carriers **(1)** and **(3)**, the component may slip with oil and drop. Be careful.



SMIL14CEX3305AA 6

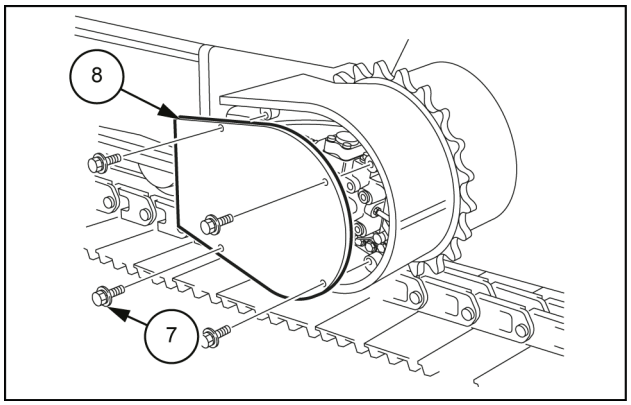
4. Mount the drain hose **(13)** and the 2 high pressure hoses **(12)** with a wrench [**27 mm** for the drain hose, **41 mm** for the high pressure hose].



SMIL14CEX3272AB 5

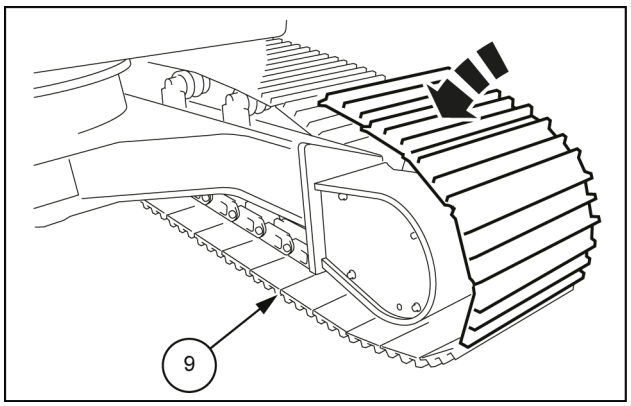
5. Mount the 4 bolts **(7)** with a wrench [**19 mm**] to mount the cover **(8)**.

   Mounting bolt tightening torque: **63.7 - 73.5 N·m** (**46.983 - 54.211 lb ft**)



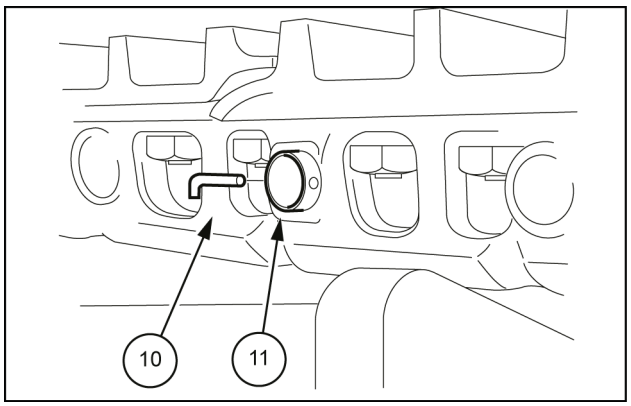
SMIL14CEX3280AB 6

6. Wind in the shoes **(9)**.



SMIL14CEX3281AB 7

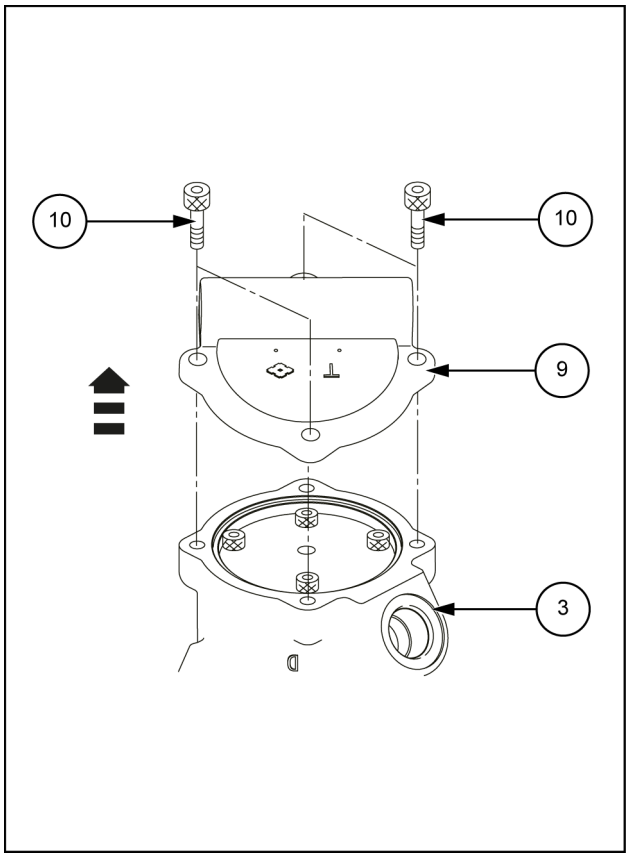
7. Insert the master pin **(11)**.
   Insert the S-pin **(10)** and bend it so as to prevent falling out.



SMIL14CEX3282AB 8

10. Using a hexagon wrench [**8 mm**], coat the hexagon socket head bolts **(10)** with **LOCTITE® 262™**, install the cover **(9)** on the rotor **(3)**, and tighten to the specified tightening torque.

    Installation bolt tightening torque: **62.7 - 72.5 N·m** (**46.25 - 53.47 lb ft**)



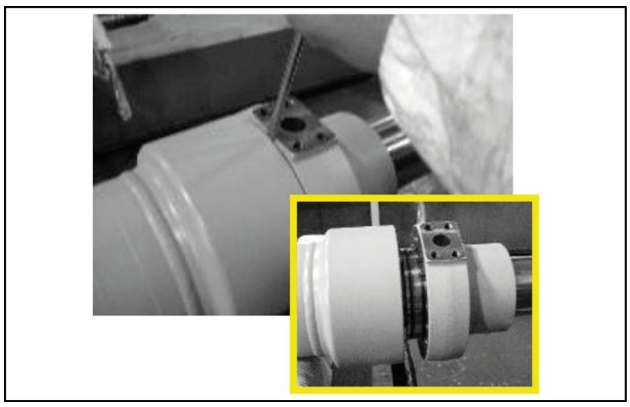
SMIL14CEX1367BB 10

4. Disassembly of rod cover

   Before starting rod cover disassembly, lift up the rod with the liftcrane so that the rod and the cylinder tube form a straight line and support the weight of the extended rod.

   Place a plastic hammer against the rod cover line port flange section corner, and then strike the plastic hammer with a steel hammer to open up a gap between the mating surfaces.

   Then, insert a flathead screwdriver into the gap and pry to gradually widen the gap and take out the rod cover fitting section.



SMIL14CEX3676AA 8

5. Removal of rod assembly

   Hoist up the rod aiming for the center of gravity of the rod assembly, and then gradually remove the rod assembly while swinging the rod up and down, left and right.

   The moment the rod comes out, the center of gravity of the hoisted load shifts and the rod may tilt and the hoist belt slip. Therefore, support the rod securely so that it does not tilt. (In order to make it harder for the rod to slip, we recommend wrapping the belt around the rod and hoisting it tightly.)

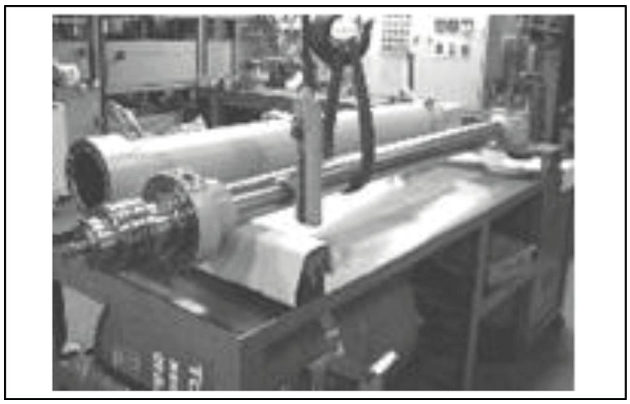
SMIL14CEX3677AA 9

6. Installation and fastening of rod assembly

   Temporarily place the removed rod assembly level and stable on crossties.

   In order to prevent scratches on the rod surface, cover the crossties with a rag, and then place the rod assembly on the rag.

   Using the flat surface of the rod head, clamp the rod in place so that the rod assembly does not move to install it in preparation for disassembly.



SMIL14CEX3678AA 10

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CX350D Crawler excavators LC version (TIER4 FINAL) - NA Market

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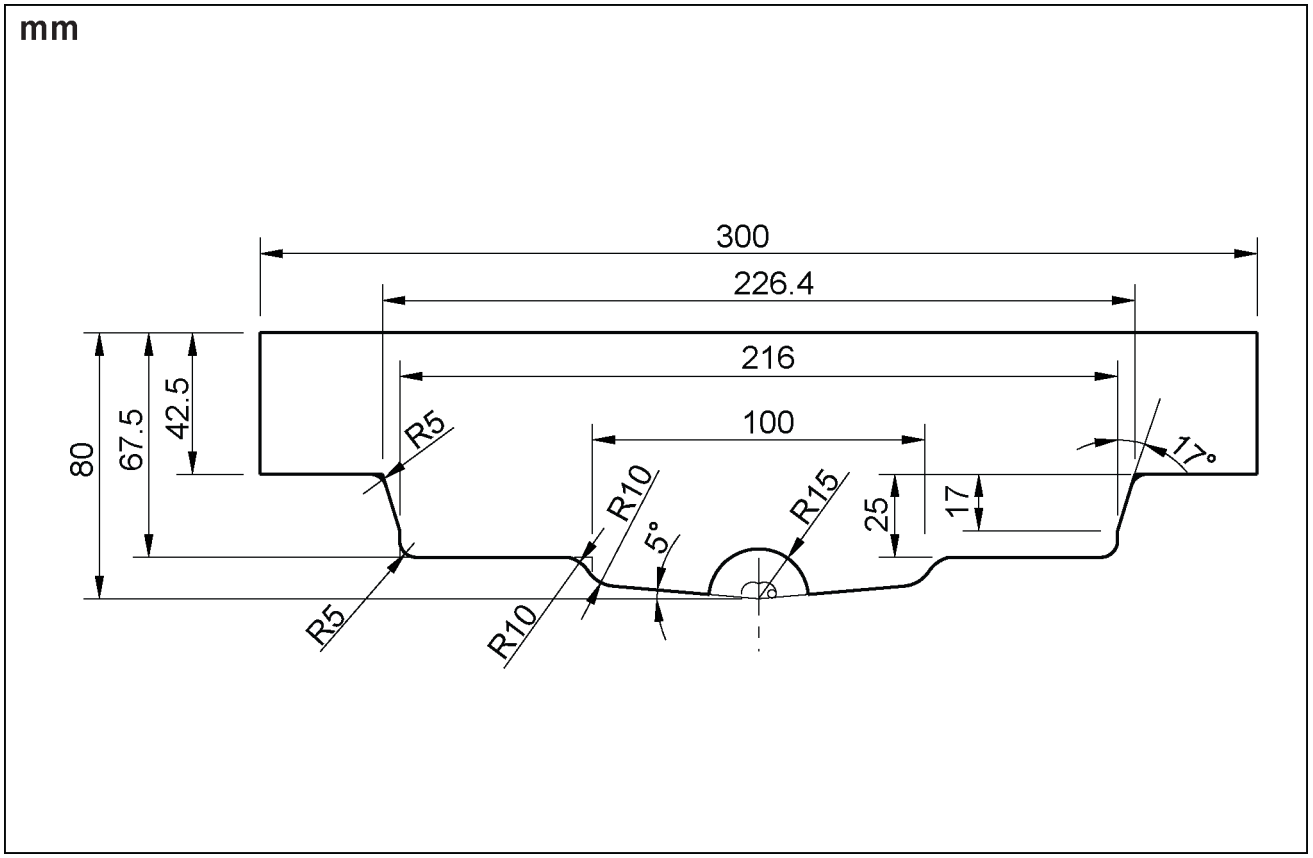
Track frame roller - Dimension

Inspection gauge for lower roller



SMIL14CEX2928FA 1

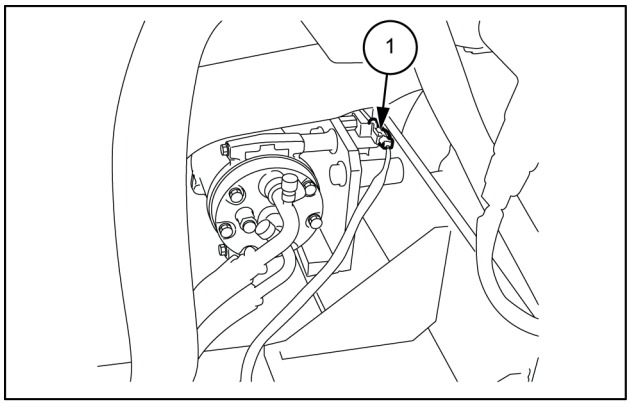
NOTE: *All the dimensions in figure are in mm*

Contents

Cab climate control - 50

Air-conditioning compressor - Remove

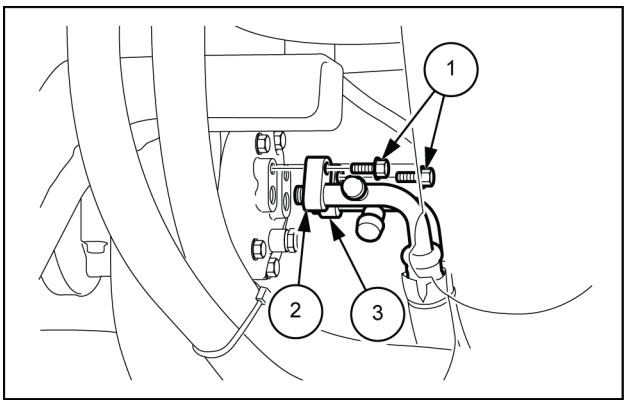
1. Remove the connector **(1)**.



SMIL14CEX1820AB 1

2. Use a box wrench (**13 mm**) to loosen the bolts **(1)** on the lines in the 2 locations, and then remove the 2 lines **(2)** and **(3)**.
   - Always remove the low-pressure side line **(2)** first.
   - Install caps or plugs to the compressor and lines to prevent any entry of water, dust or dirt.

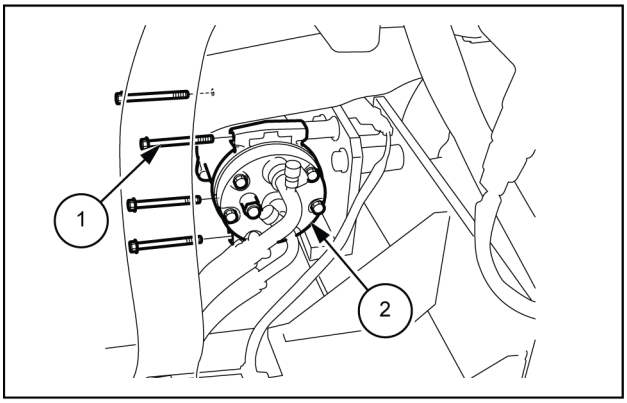
   Tightening torque for bolt installation: **19.6 - 24.5 N·m** (**14.5 - 18.1 lb ft**)



SMIL14CEX1821AB 2

3. Use a wrench (**13 mm**) to remove the 4 bolts **(1)**, and then remove the compressor **(2)**.

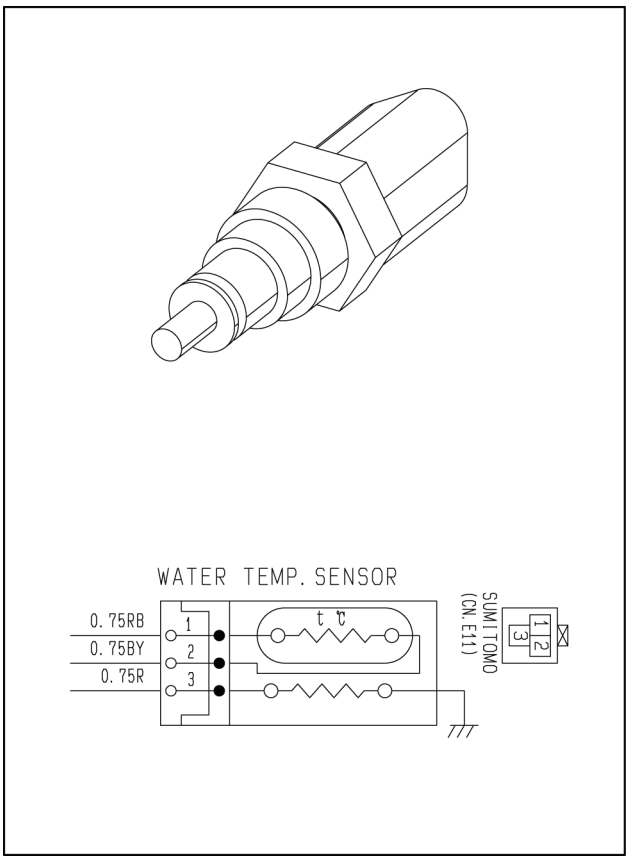
   Tightening torque for bolt installation: **19.6 - 24.5 N·m** (**14.5 - 18.1 lb ft**)



SMIL14CEX1822AB 3

Engine coolant temperature sensor

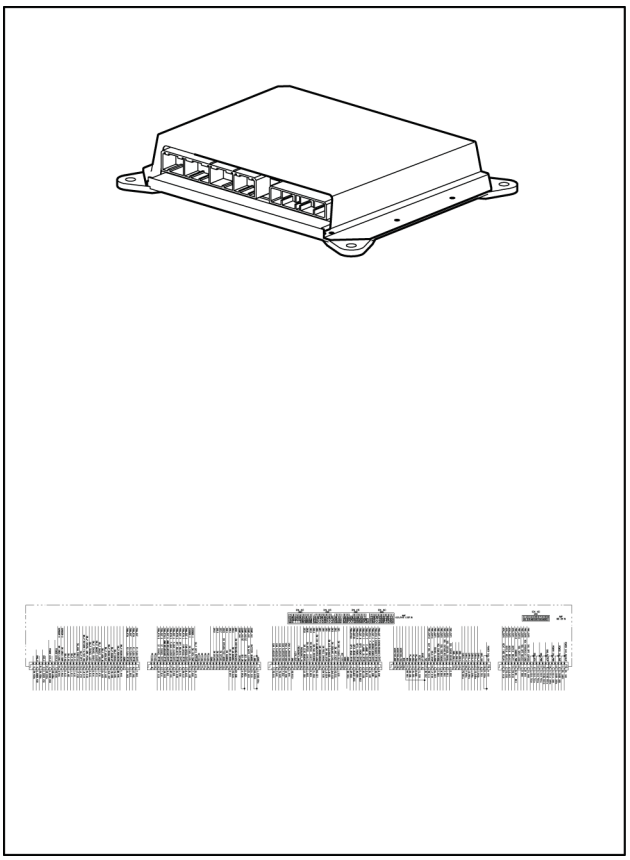
Isuzu Part No.: 898023-7170



SMIL14CEX4109BA 29

Main controller

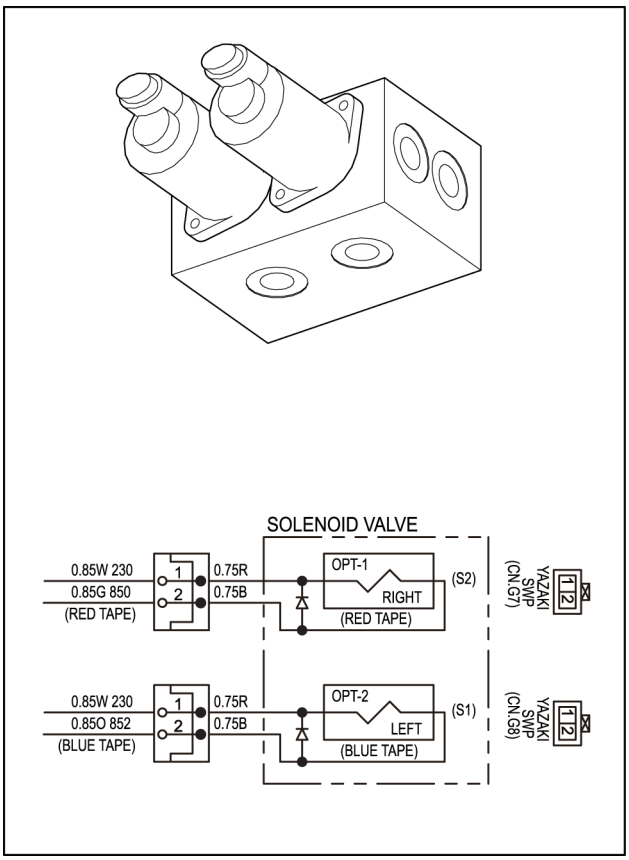
Part No.: KHR34640-B



SMIL14CEX4110BA 30

2 stack solenoid valve

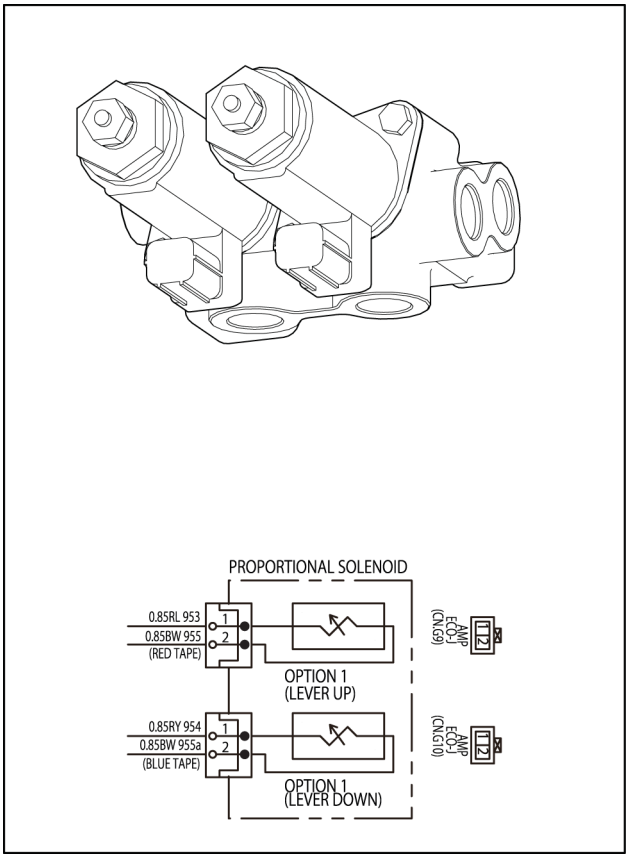
Part No.: KHJ14000-B



SMIL14CEX4190BA 94

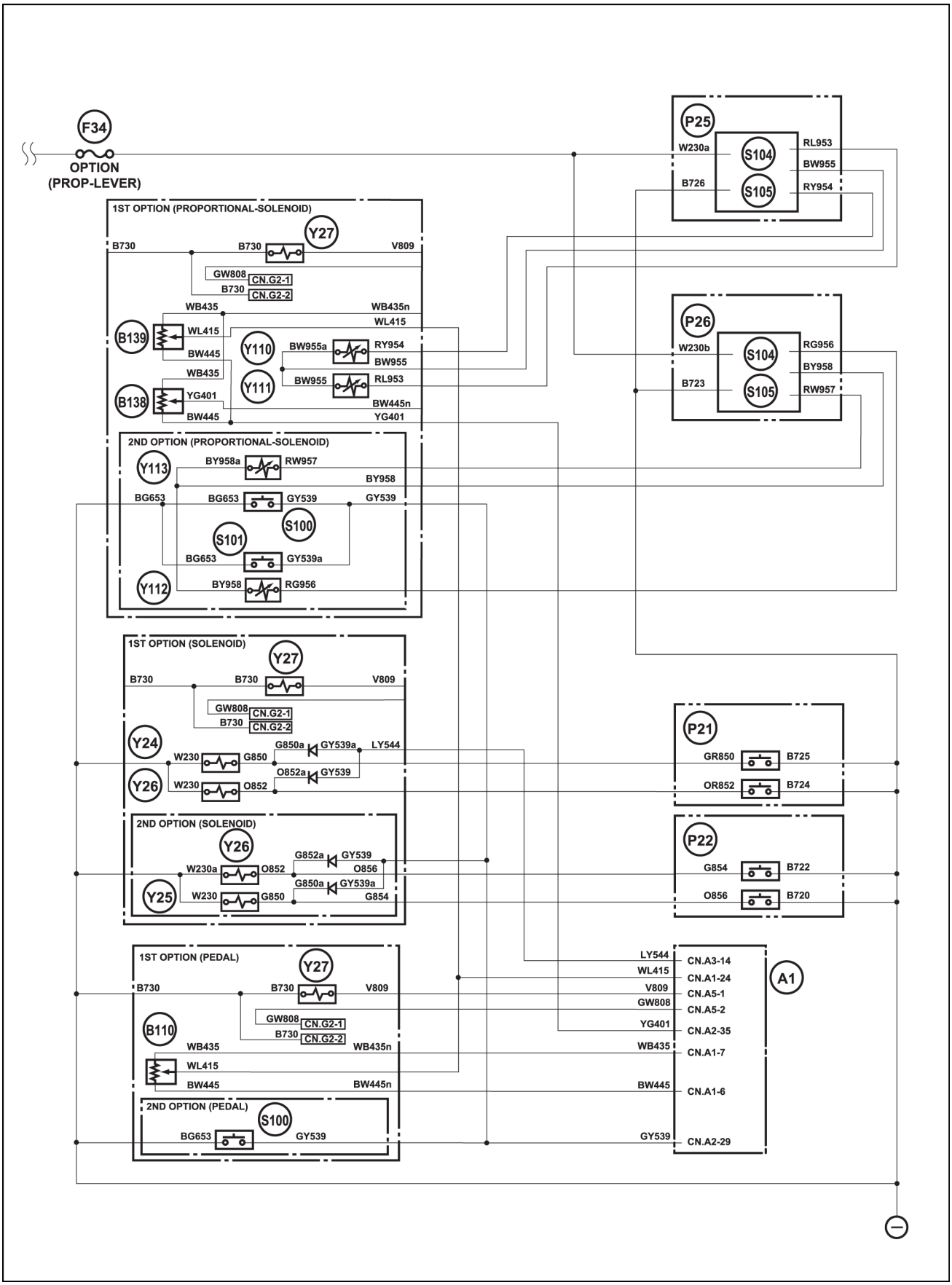
Reducing valve

Part No.: MFJ71500-A

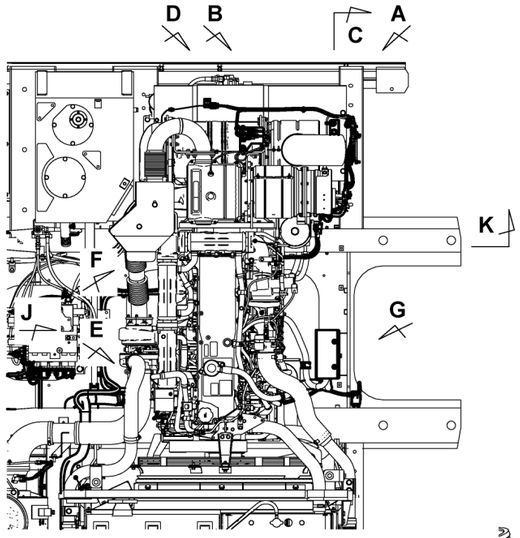


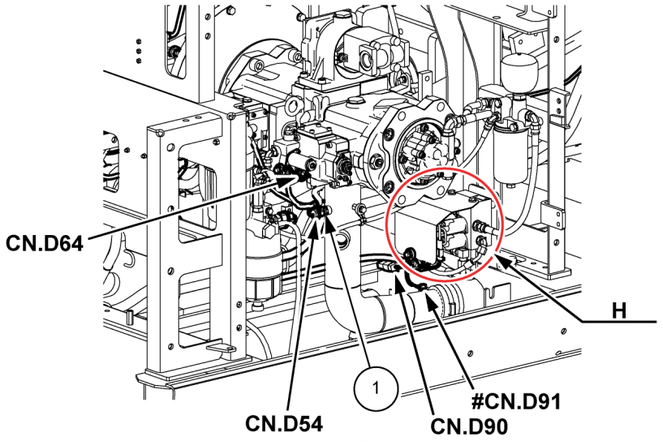
SMIL14CEX4191BA 95

Option



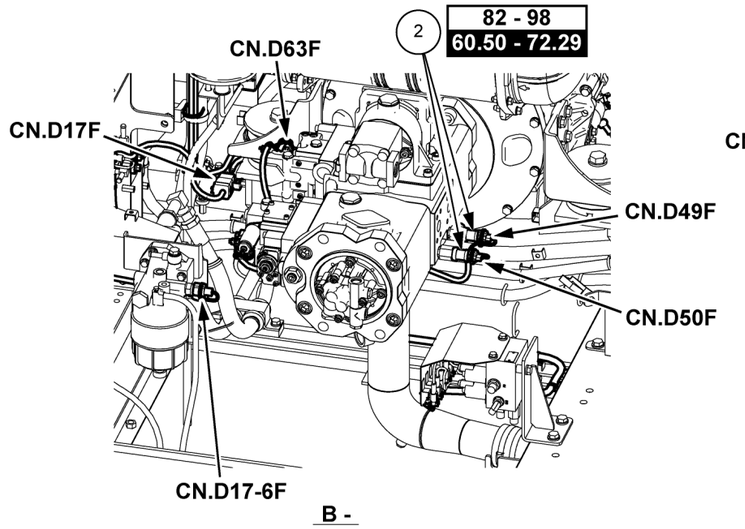
SMIL14CEX1230HA 9



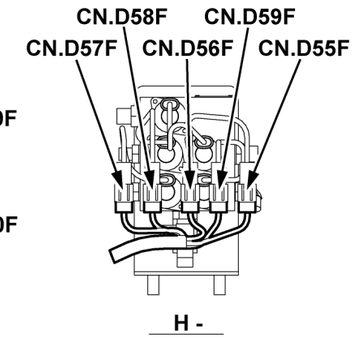


A -

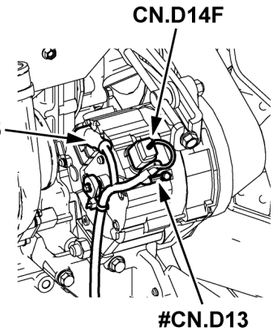
Nm
lbf·ft.



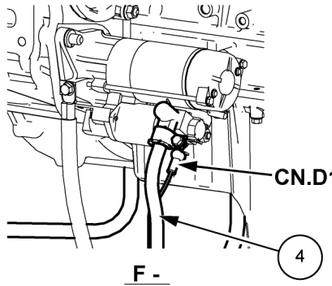
B -



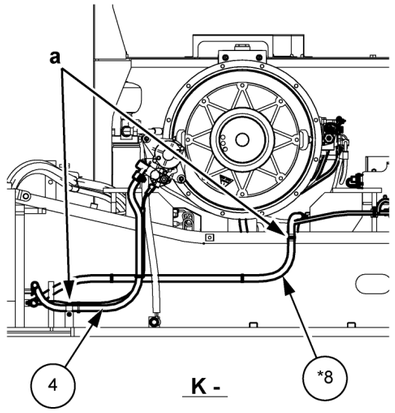
H -



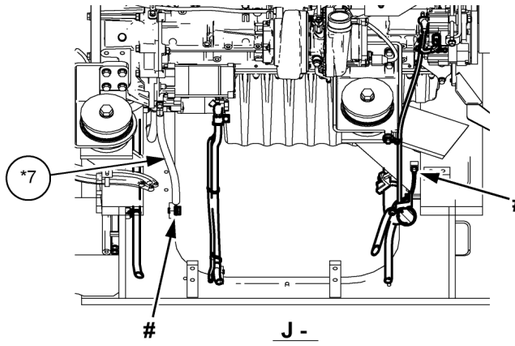
E -



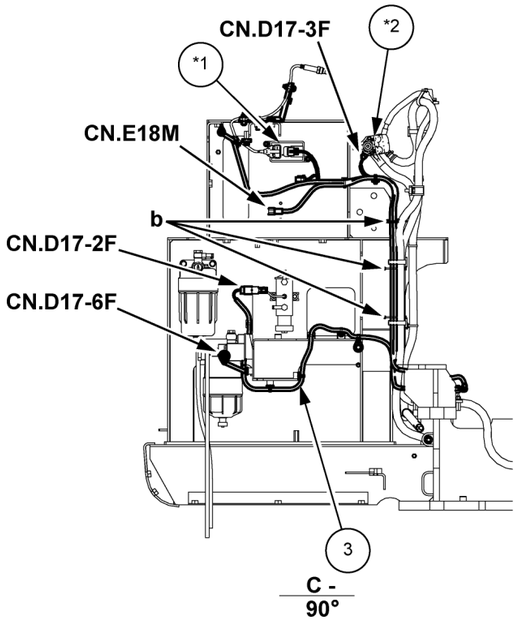
F -



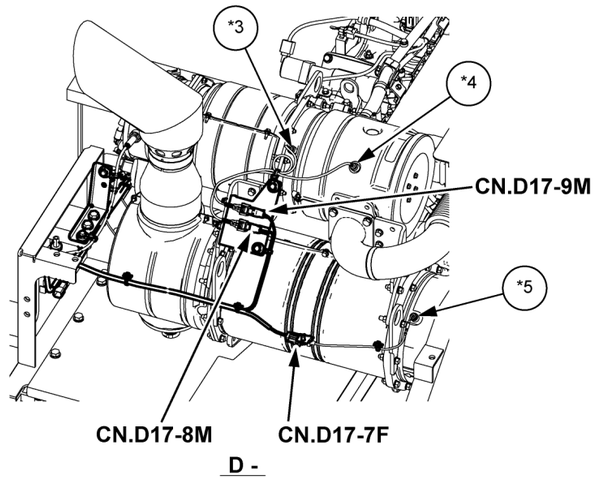
K -



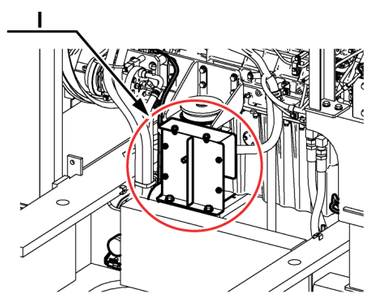
J -



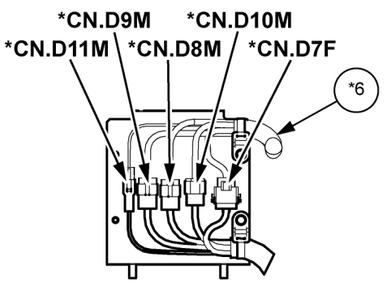
C -
90°



D -

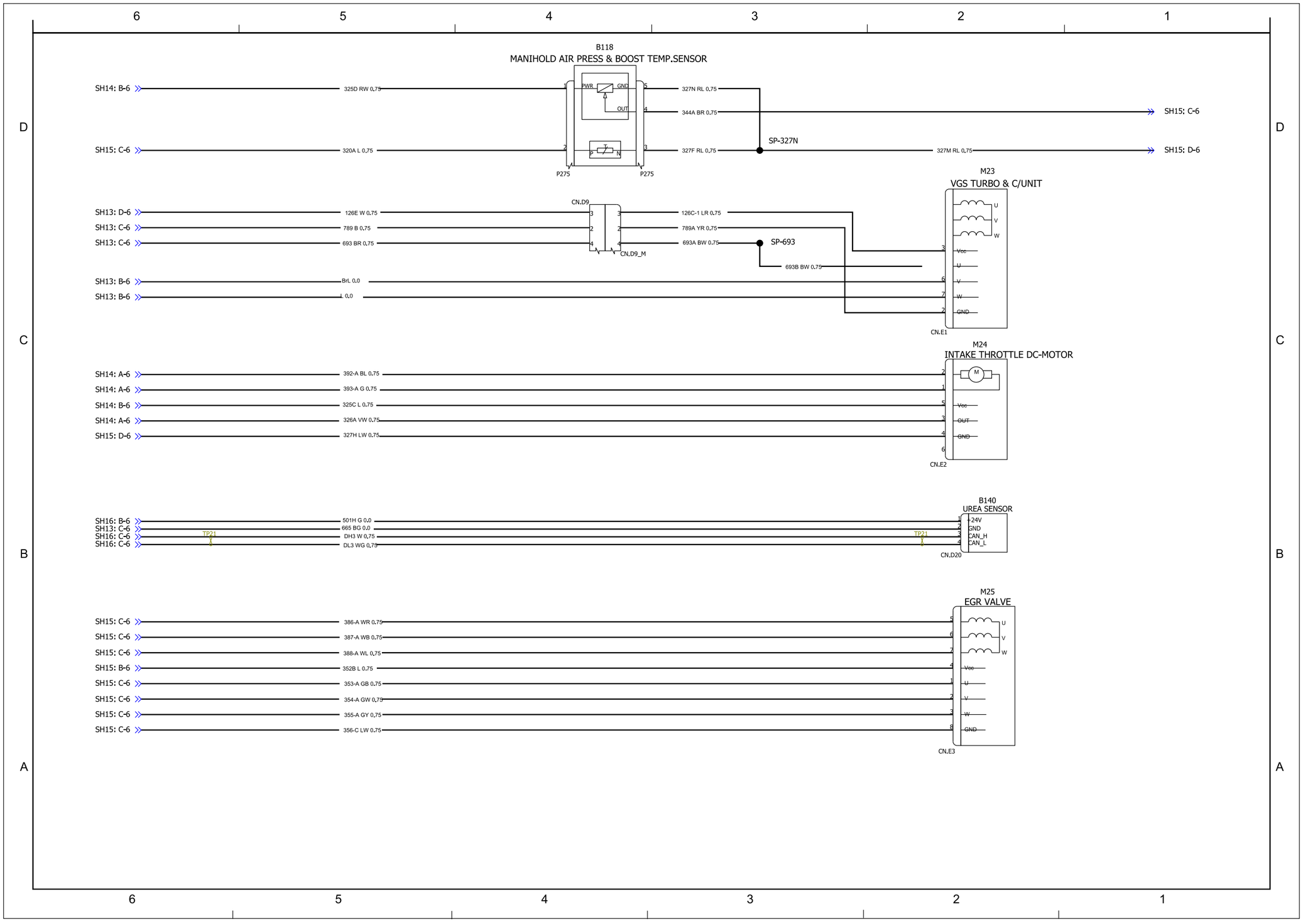


G -



I -

SMIL14CEX5009JB 3


6
5
4
3
2
1
D
C
B
A
B118
MANIHOLD AIR PRESS & BOOST TEMP.SENSOR
SH14: B-6
325D RW 0.75
PWR
GND
OUT
327N RL 0.75
344A BR 0.75
SH15: C-6
SH15: C-6
320A L 0.75
327F RL 0.75
SP-327N
327M RL 0.75
SH15: D-6
P275
P275
M23
VGS TURBO & C/UNIT
CN.D9
SH13: D-6
126E W 0.75
126C-1 LR 0.75
SH13: C-6
789 B 0.75
789A YR 0.75
SH13: C-6
693 BR 0.75
693A BW 0.75
SP-693
693B BW 0.75
CN.D9_M
U
V
W
Vcc
U
V
W
GND
SH13: B-6
BrL 0.0
SH13: B-6
L 0.0
CN.E1
M24
INTAKE THROTTLE DC-MOTOR
SH14: A-6
392-A BL 0.75
SH14: A-6
393-A G 0.75
SH14: B-6
325C L 0.75
SH14: A-6
326A VW 0.75
SH15: D-6
327H LW 0.75
Vcc
OUT
GND
CN.E2
B140
UREA SENSOR
SH16: B-6
501H G 0.0
SH13: C-6
665 BG 0.0
SH16: C-6
TP21
DH3 W 0.75
TP21
SH16: C-6
DL3 WG 0.75
24V
GND
CAN_H
CAN_L
CN.D20
M25
EGR VALVE
SH15: C-6
386-A WR 0.75
SH15: C-6
387-A WB 0.75
SH15: C-6
388-A WL 0.75
SH15: B-6
352B L 0.75
SH15: C-6
353-A GB 0.75
SH15: C-6
354-A GW 0.75
SH15: C-6
355-A GY 0.75
SH15: C-6
356-C LW 0.75
U
V
W
Vcc
U
V
W
GND
CN.E3
SHT_21 1

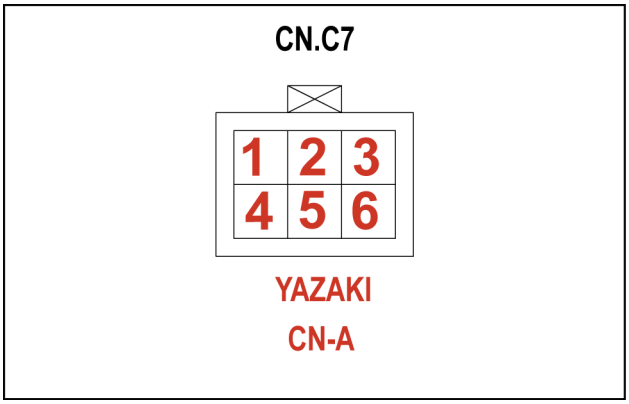
Wiring harnesses - Electrical schematic sheet 37 - OPTION POWER / FVM, KEY SWITCH

Type	Component	Connector	Description
module	X44		Option power/FVM
Relay	R3		Throttle vol.
Switch	S51		Limit switch (GATE)
Switch	S1		Key switch
Load carrier	X45		Air suspension
Connector	CN.A25	**CN.A25**	Option power/FVM
Connector	CN.B2	**CN.B2**	Throttle vol.
Connector	CN.B1	**CN.B1**	Key switch
Connector	CN.B3	**CN.B3**	Limit switch (GATE)
Connector	CN.B3_M		Limit switch (GATE)
Connector	CN.B20	**CN.B20**	Air suspension
Connector	CN.B20_M		Air suspension
Connector	CN.B21	**CN.B21**	
Diode	CN.B4	**CN.B24**	

Wire Break

Component	Connector / Link	Description
WB-011	**Wiring harnesses - Electrical schematic sheet 29 - MAIN CAB-ECM INTER CONNECTOR (55.100)**	
WB-1060	**Wiring harnesses - Electrical schematic sheet 05 - MAIN CONTROLLER A1 (55.100)**	
WB-1081	**Wiring harnesses - Electrical schematic sheet 03 - POWER DISTRIBUTION (55.100)**	
WB-1099	**Wiring harnesses - Electrical schematic sheet 09 - MAIN CONTROLLER A1 (55.100)**	
WB-116	**Wiring harnesses - Electrical schematic sheet 03 - POWER DISTRIBUTION (55.100)**	
WB-1218	**Wiring harnesses - Electrical schematic sheet 03 - POWER DISTRIBUTION (55.100)**	
WB-1242	**Wiring harnesses - Electrical schematic sheet 05 - MAIN CONTROLLER A1 (55.100)**	
WB-1320	**Wiring harnesses - Electrical schematic sheet 26 - AIR CONDITIONER SWITCH PANEL & UNIT (55.100)**	
WB-1344	**Wiring harnesses - Electrical schematic sheet 26 - AIR CONDITIONER SWITCH PANEL & UNIT (55.100)**	
WB-1370	**Wiring harnesses - Electrical schematic sheet 05 - MAIN CONTROLLER A1 (55.100)**	
WB-1449	**Wiring harnesses - Electrical schematic sheet 04 - POWER DISTRIBUTION (55.100)**	
WB-1500	**Wiring harnesses - Electrical schematic sheet 05 - MAIN CONTROLLER A1 (55.100)**	
WB-174	**Wiring harnesses - Electrical schematic sheet 10 - MAIN CONTROLLER A1 (55.100)**	
WB-204	**Wiring harnesses - Electrical schematic sheet 26 - AIR CONDITIONER SWITCH PANEL & UNIT (55.100)**	
WB-282	**Wiring harnesses - Electrical schematic sheet 04 - POWER DISTRIBUTION (55.100)**	
WB-312	**Wiring harnesses - Electrical schematic sheet 05 - MAIN CONTROLLER A1 (55.100)**	
WB-375	**Wiring harnesses - Electrical schematic sheet 09 - MAIN CONTROLLER A1 (55.100)**	
WB-408	**Wiring harnesses - Electrical schematic sheet 09 - MAIN CONTROLLER A1 (55.100)**	
WB-411	**Wiring harnesses - Electrical schematic sheet 05 - MAIN CONTROLLER A1 (55.100)**	
WB-774	**Wiring harnesses - Electrical schematic sheet 03 - POWER DISTRIBUTION (55.100)**	
WB-792	**Wiring harnesses - Electrical schematic sheet 05 - MAIN CONTROLLER A1 (55.100)**	

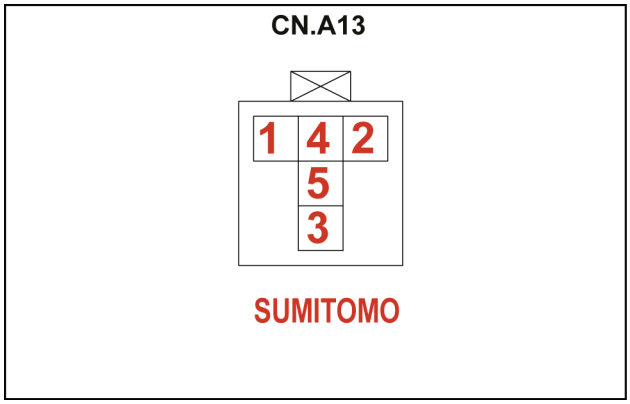
CONNECTOR CN.C7 – WIPER MOTOR (6-PIN) (Male)



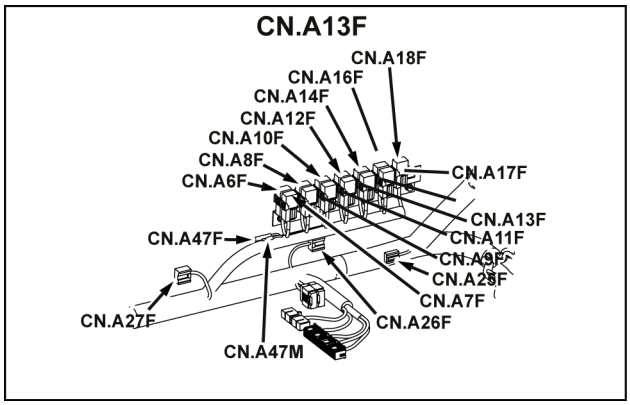
SMIL14CEX5199AA 43

Pin	From	Wire	Description	Color-Size	Frame
1	CN.C6 pin 5	827		LR - 0.85	**SHEET 35**
3	CN.C6 pin 6	828		LB - 0.85	
4	CN.C6 pin 7	485		G - 0.85	
5	SP-711 pin-X	711		B - 1.25	
6	CN.C6 pin 8	486		L - 0.85	

CONNECTOR CN.A13 – CAB LAMP RELAY (5-PIN) (Female)



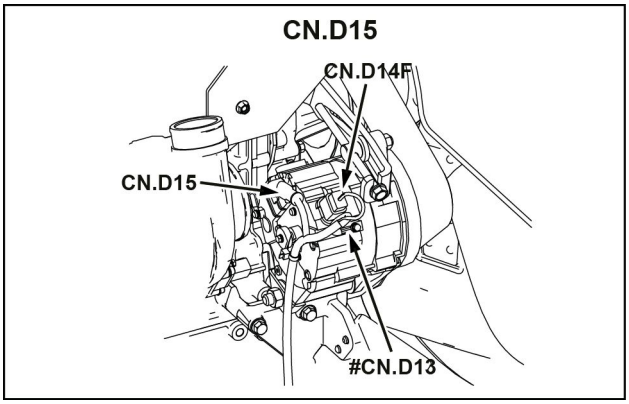
SMIL14CEX5256AA 7



SMIL14CEX5257AA 8

Pin	From	Wire	Description	Color-Size	Frame
1	SP-205A pin X	205A		GrR - 1.25	**SHEET 31**
2	SP-823A pin X	823D		WG	
3	SP-205A pin X	205		GrR - 1.25	
5	CN.A41_M pin 5	875		GR - 1.25	**SHEET 15**

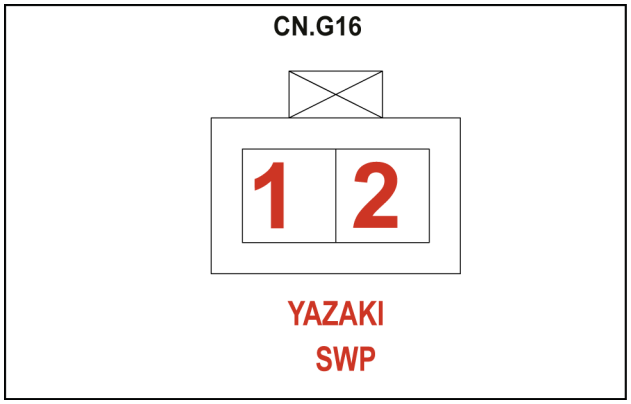
CONNECTOR CN.D15 – ALTERNATOR E (1-PIN)



SMIL14CEX6134AA 53

Pin	From	Wire	Description	Color-Size	Frame
M5	CN.D16 pin JST	797		B - 20.0	**SHEET 01**

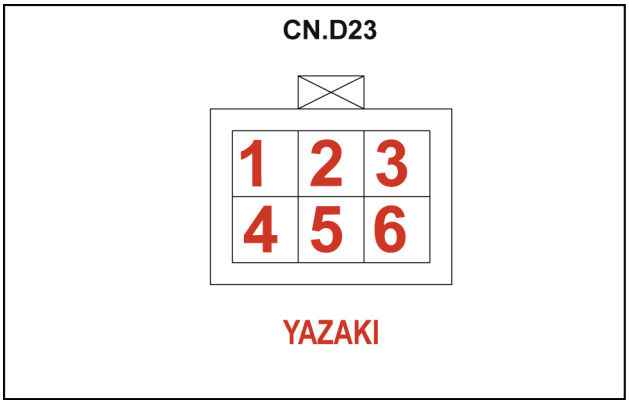
CONNECTOR CN.G16 – SOLENOID VALVE (S2) (2-PIN) (Male)



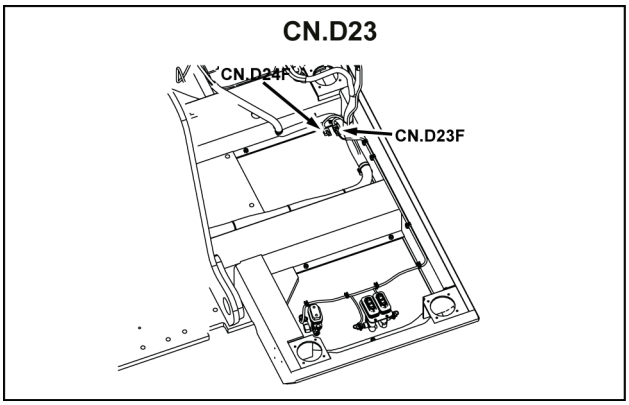
SMIL14CEX5960AA 96

Pin	From	Wire	Description	Color-Size	Frame
JST	CN.D15.pin M5	797		B - 20.0	**SHEET 22**
JST	SP-770 pin X	770A		B - 1.25	

CONNECTOR CN.D23 – FLOOR HARNESS 1 (6-PIN) (Female)



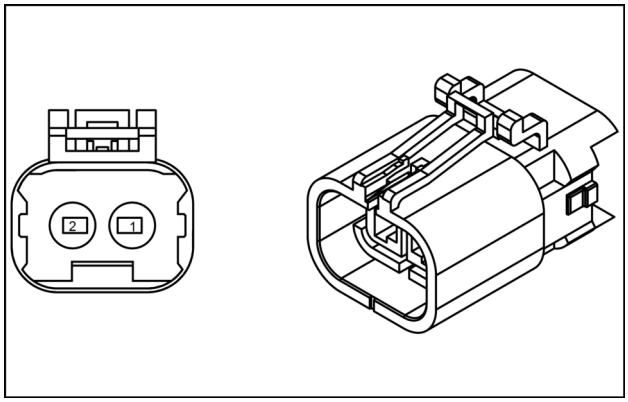
SMIL14CEX5372AA 43



SMIL14CEX5371AA 44

Pin	From	Wire	Description	Color-Size	Frame
1	SP-435U pin X	435M		WL - 0.85	**SHEET 17**
2	CN.D23-1 pin 2	411B		OR - 0.85	
3	CN.D23-2 pin 2	412B		OL - 0.85	
4	CN.D23-3 pin 2	413B		OW - 0.85	
6	SP-445U pin X	445M		BW - 0.85	

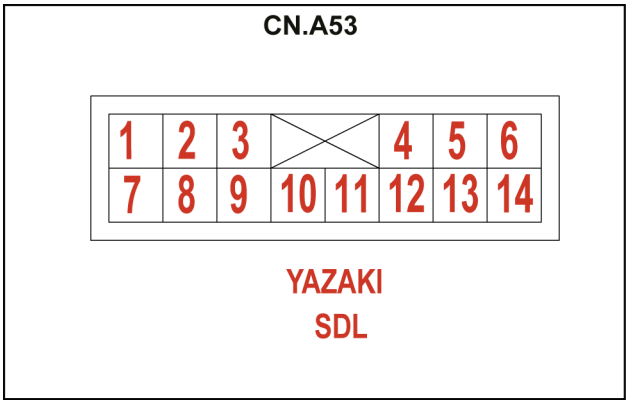
CONNECTOR CN.D34-1 - REFUEL PUMP (2-PIN) (Male)



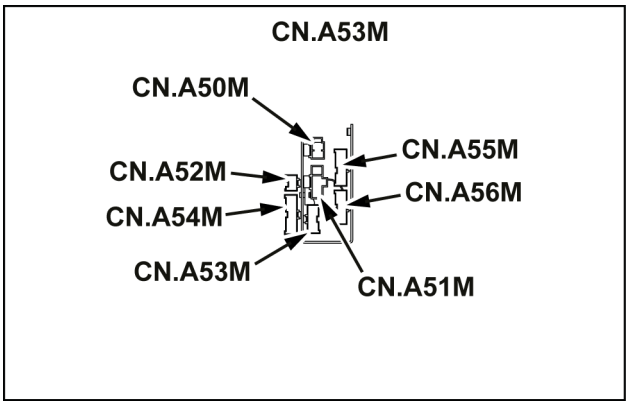
87714689 28

Pin	From	Wire	Description	Color-Size	Frame
1	SP-765-P-X	764		B - 1.25	**SHEET 27**
2	CN.D34-3-P-5	892		LR - 1.25	

CONNECTOR CN.A53 – CAB MAIN HARNESS D (14-PIN) (Male)



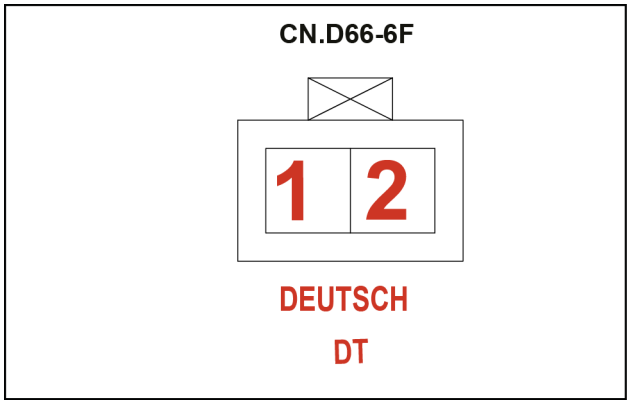
SMIL14CEX5229AA 7



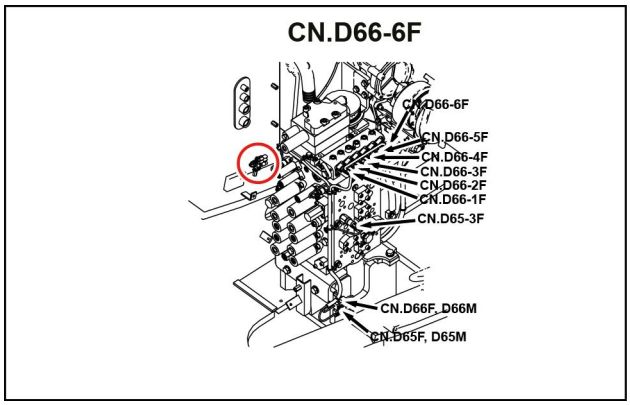
SMIL14CEX5231AA 8

Pin	From	Wire	Description	Color-Size	Frame
1	SP-126B pin X	126H		W - 1.25	**SHEET 12**
2	SP-501F pin X	501T		G - 0.85	**SHEET 15**
3	CN.A6 pin 1	370C		YR - 0.85	**SHEET 12**
4	CN.A7 pin 2	373-A		LR - 0.85	
5	SP-011A pin X	011B		Y - 0.85	
6	CN.A44 pin 5	302A		LG - 0.85	**SHEET 13**
7	SP-AH1 pin X	AH1-B		Y	**SHEET 12**
8	SP-AL2 pin X	AL1-B		YG	
9	SP-BH2 pin X	BH0-B		L	
10	SP-BL2 pin X	BL0-C		LG	
11	CN.A20 pin 12	082A		PB	**SHEET 13**
12	SP-080A pin X	080B		PL	**SHEET 12**
14	CN.A5 pin 3	805A		BrY	**SHEET 13**

CONNECTOR CN.D66–6 – ARM1 PARALLEL PROPORTIONAL SOLENOID VALVE (2-PIN) (Male)



SMIL14CEX6154AA 33



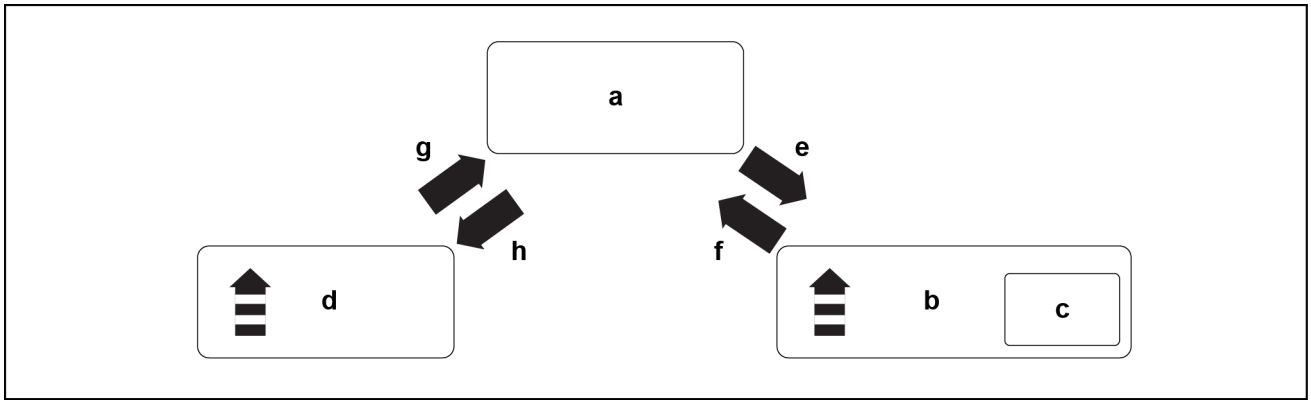
SMIL14CEX6153AA 34

Pin	From	Wire	Description	Color-Size	Frame
1	CN.D66_M pin 11	903A-2		WG - 0.85	**SHEET 33**
2	CN.D66_M pin 12	903B-2		LgR - 0.85	

Cab engine controls - Dynamic description - Auto warm up

Purpose/overview

In case of low coolant temperature when the engine is started, the engine is warmed up automatically. (Auto warm-up)
When the outside air temperature is **-10 °C** (**14 °F**) or less, a warm-up will be carried out so that urea may not freeze. (Urea thawing, heat insulating and warm-up)
The urea thawing, heat insulating and warm-up operation always performs a warm-up according to how you operate the machine.
When, during the auto warm-up, the outside air temperature is **-10 °C** (**14 °F**) or less, a warm-up will be carried out to ensure the heating performance. (Quick warm-up)
Since the urea thawing, heat insulating and warm-up operation overrides the quick warm-up, the quick warm-up is carried out as only a part of the auto warm-up.



SMIL14CEX6811EB 1

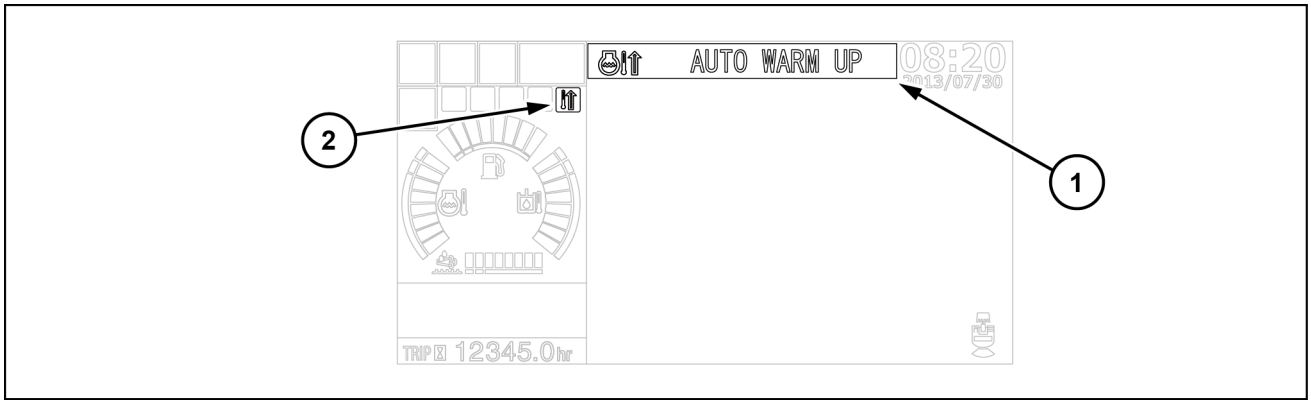
a	Normal	e	The engine is started.
b	Auto warm-up	f	The coolant temperature increases.
c	Quick warm-up	g	The machine is operated.
d	Urea thawing, heat insulating and warm-up	h	The machine is not operated.

There are three warm-up controls:

- Auto warm-up
- Quick warm-up
- Urea thawing, heat insulating and warm-up

During the warm-up, the monitor displays the following.

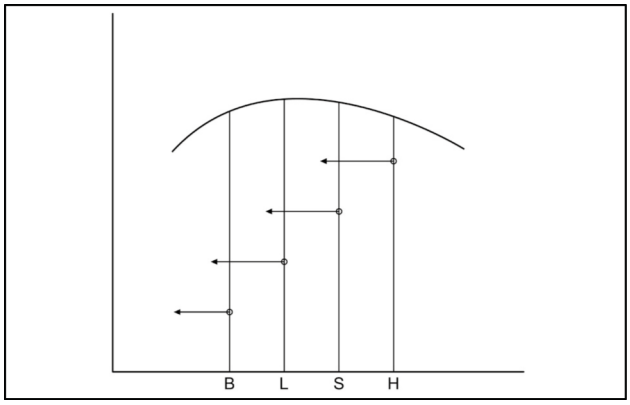
- During the auto or the quick warm-up, the auto warm-up message appears on the monitor.
- During the urea thawing, heat insulating and warm-up, only the icon appears on the monitor.



SMIL14CEX6812EB 2

1	Message display
2	Icon display

H, S, L and B of the mode map switch change as follows depending on the APS input.

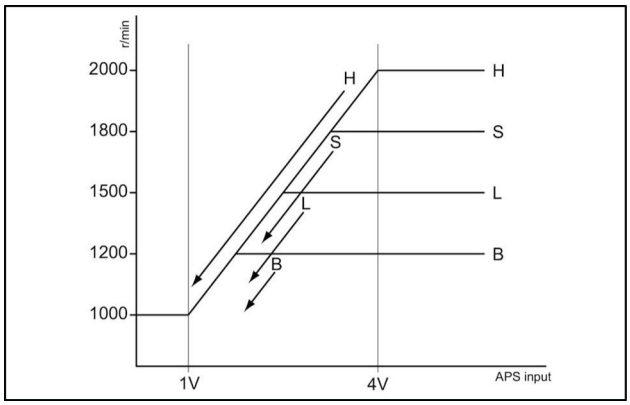


SMIL14CEX3978AA 18

Mode map switch and meaning of each mode

Engine speed can be lowered from each mode position in models with APS.

The set engine speeds for H, S, L, and B are determined by calibration of the ECM.

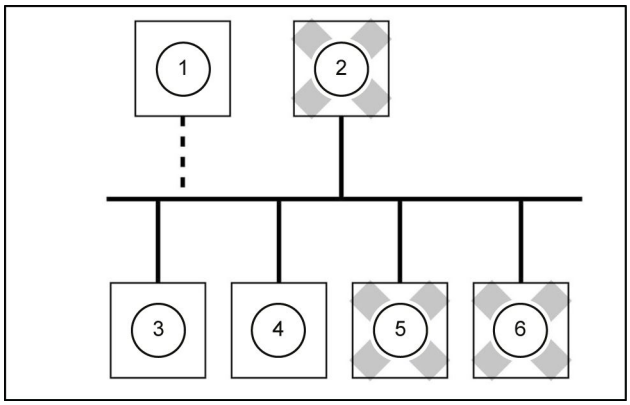


SMIL14CEX3979AA 19

CAN communication

When CAN controller does not exist on the machine side

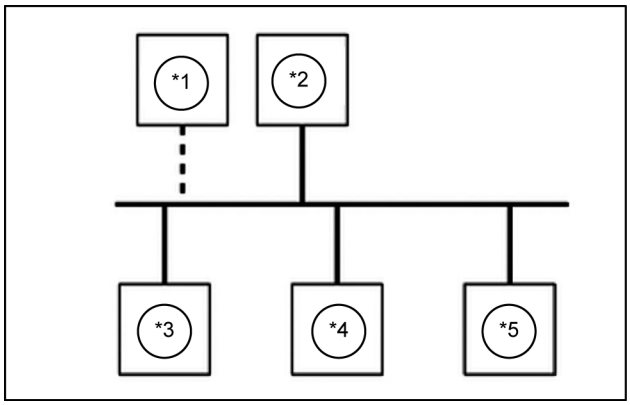
*1. Diagnostic scan tool
*2. MCX
*3. ECM
*4. LCD
*5. TCM
*6. Shift Control



SMIL14CEX3980AB 20

When CAN controller exists on the machine side

*1. Diagnostic scan tool
*2. MCX
*3. ECM
*4. TCM
*5. Shift Control



SMIL14CEX0567AB 21

5. Use the trouble diagnosis scan tool and confirm the DTCs of the ECU that has communication established.

   Loss of communication with the trouble diagnosis scan tool occurs due to the abnormalities in the communication circuit of each ECU and the trouble diagnosis scan tool.

6. Start the engine.

   - If the starter does not operate, inspect the starter circuit system.
   - If the engine does not start, check the DTC.
   - If the DTC is detected, inspect the corresponding DTC.
   - If no DTC has been detected, inspect the starting system.

7. Check the engine stalling for problems.
8. Check the engine hunching and rough idling for problems.
9. Check if there are problems with insufficient engine output, blowup failure, or engine hesitation.
10. Check for problems with sudden stopping.
11. Check for problems with sudden change.
12. Check for problems with insufficient output or blowup failure.
13. Check for problems with engine hesitation or acceleration failure.
14. Check for problems with dark smoke.
15. Check for problems with white smoke.
16. Check for problems with the idling revolution speed maladjustment.
17. Check for problems with the idling revolution speed not decreasing.

Also, perform functional diagnosis inspection, check operations and control in each area, and repair any abnormalities.

Engine stalling - Symptoms

The engine cranks but does not start for a long time.

The engine starts after a while or it starts but stops immediately.

Engine stalling - Diagnosis

Preliminary inspection

Before using this section, perform a functional inspection and OBD system check to check all of the following items.

Check whether there is an excessive load on the actual machine.

The ECM and monitor are operating correctly.

CKP sensor abnormalities are not diagnosed unless the crank rotates at least 14 times. Crank the engine for **14 s**. or more at **60 RPM**.

Check DTCs.

CKP sensor diagnostic trouble codes may not be detected for CKP sensor problems during low rotation of the engine.

For intermittent trouble, increase the engine speed to the maximum with no load and check whether a CKP sensor related diagnostic trouble code is detected.

The scan tool data is within the normal operation range. Check the condition of the actual machine and find applicable symptoms.

Confirm with the customer that the stipulated engine oil and fuel are being used.

Check whether there is any fuel.

Visual inspection

Some symptoms detection procedures require careful visual inspection.

This allows for problems to be repaired without performing further inspection, which saves valuable time.

The following items are included in this inspection.

Check for connector connection problems.

Especially important for CKP and CMP sensors.

Check for correct wiring connections, tightness, and disconnections, and then check whether the power supply for commercially-available accessories is being diverged from the ECM power supply.

Check whether the ECM ground is dirty and check that it is securely installed in the correct location.

Electrical systems - 55

Alternator - 301

CX350D Crawler excavators LC version (TIER4 FINAL) - NA Market

Connecting the battery ground cable

1. Connect the battery ground cable to the battery.

Trouble diagnosis: Inducement is determined by the operating hours that have passed since a trouble diagnosis was established.

There are also two types of stages in the judgment based on a trouble diagnosis.

1. If an operation condition occurs in normal mode.
2. If an operation condition recurs within the predetermined time after it occurs. (Repeat offense (Repetition)) Processing and judgment time differ between **(1)** and **(2)**.

Judgment in normal mode

The concept of judgment flow is as follows. Since this is just a concept, the actual control logic differs a little. It also differs according to the operation condition.

Remaining urea level

Step	Judgment condition in normal mode	Yes	No
1.	Since the key was ON, **4 s** has passed, and also DCU-ECM communication is normal	To step 2	Status quo maintained
2.	The remaining urea level remains **0 %** for **10 s**	Final inducement triggered	To step 3
3.	The remaining urea level remains **5 %** or less for **10 s**	Early inducement triggered	To step 4
4.	The remaining urea level remains **10 %** or less for **10 s**	Put into the warning state	Put into the normal state

Urea solution quality / Urea injection stop / SCR system failure / NCD-target component failure

Step	Judgment condition in normal mode	Yes	No
1.	Since the key was ON, **60 s** has passed, and also DCU-ECM communication is normal	To step 2	Status quo maintained
2.	The abnormality detection state remains for **3.5 h**	Final inducement triggered	To step 3
3.	The abnormality detection state remains for **3 h**	Early inducement triggered	To step 4
4.	The abnormality detection state remains for **10 s**.	Put into the warning state	Put into the normal state

EGR system failure

Step	Judgment condition in normal mode	Yes	No
1.	An EGR system-related error code occurred	To step 2	Status quo maintained
2.	An EGR system failure remains for **100 h**	Final inducement triggered	To step 3
3.	An EGR system failure remains for **36 h**	Early inducement triggered	Put into the warning state simultaneously with the EGR system failure

Judgment in repeat offense (repetition) mode

Repeat offense is only triggered when the same failure is repeated.

Transitions between normal and repeat offense states (modes) are shown below.

Step	Judgment condition in normal mode	Yes	No
1.	(1) In normal mode	To step 2	-
2.	Inducement is triggered	To step 3	Status quo maintained
3.	The inducement condition is cleared	To step 4	Status quo maintained
4.	(2) Repeat offense mode is established	To step 5	-
5.	(2) **40 h** or more have passed since repeat offense mode.	To step 1	To step 4

In step 3 (the inducement condition is cleared), when the DTC is cleared during inducement due to trouble diagnosis, this condition will be passed and repeat offense mode will be established.

4. Replenish the radiator with coolant.

NOTE: *While manually pressing the upper hose several times to bleed the air in the hose, add an amount of coolant equal to the difference between the remaining coolant level and the radiator cap mouth.*
Repeat until the coolant level no longer decreases.

5. Install the radiator cap to the radiator.

> ⚠ CAUTION: Securely attach the radiator cap.

6. Add coolant to the radiator reserve tank.

NOTE: *Add up to the MAX line of the radiator reserve tank. Perform the urea SCR dosing module coolant piping air bleeding process while referring to the owner's manual from the machinery manufacturer.*

> ⚠ CAUTION: Wipe off any excess coolant.

7. Start the engine.

NOTE: *Idle the engine for **5 min**.*

8. Stop the engine.

9. Remove the radiator cap from the radiator.

> ⚠ CAUTION:
>
> - Do not loosen the radiator cap or sub-tank cap when the coolant temperature is high.
> - Because steam and boiling water can burst out from the radiator and possibly cause burns, check that the engine has cooled.

10. Replenish the radiator with coolant.

NOTE: *Add an amount of coolant equal to the difference between the remaining coolant level and the radiator cap mouth.*

> ⚠ CAUTION: If the coolant amount is excessively low, inspect for coolant leakage.

11. Install the radiator cap to the radiator.

> ⚠ CAUTION: Securely attach the radiator cap.

12. Start the engine.

NOTE: *For models with heaters, the set temperature and blower speed are set to the maximum, and warm up the engine at approximately **1500 - 2000 RPM**.*
Touch the radiator upper hose, and confirm that it has become warm.

> ⚠ CAUTION: If the upper hose is not warm, perform step 12 again.

NOTE: *Idle the engine for **5 min**.*

13. Stop the engine.

Contents

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Engine oil system - 013

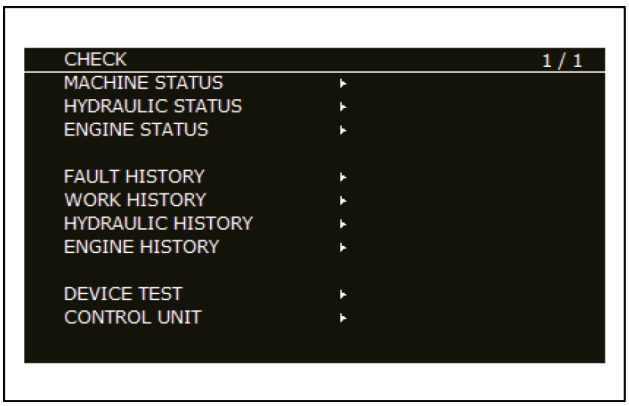
SERVICE

Instrument cluster - Overview - CHECK screen list

In CHECK mode, not only the system status (each current value, hydraulic pressure, temperature, etc.) but also the input/output state of sensors and switches can be checked.

1. Section

Refer to the attached sheet for the types of sections in the CHECK mode and their descriptions.
By pressing and on the monitor, MACHINE STATUS, HYDRAULIC HISTORY, etc. can be selected.
Detailed data for the selected item can be seen by pressing .



SMIL14CEX0914AB 1

MACHINE STATUS

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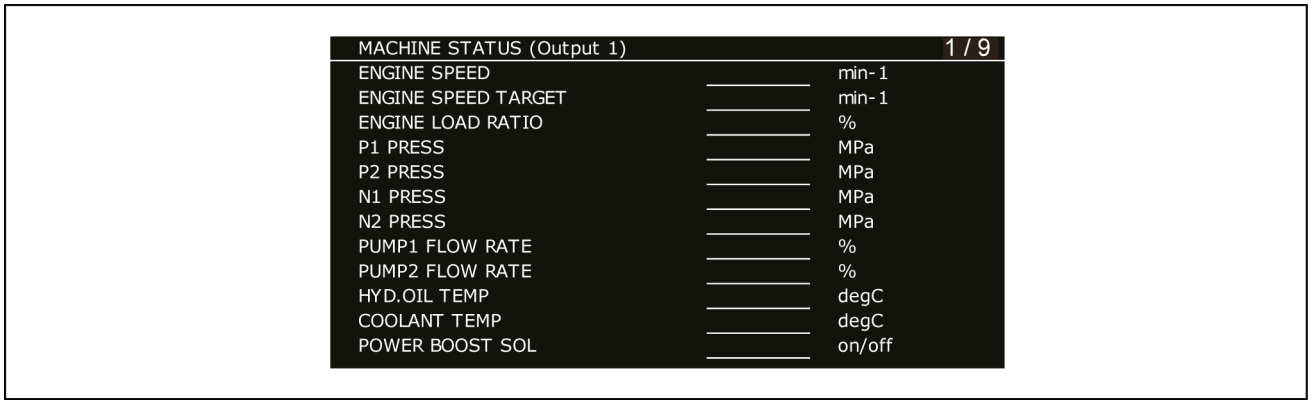

SMIL14CEX0915EB 2

Display	Explanation	Range
ENGINE SPEED	Actual engine speed	**0 - 2500 RPM**
ENGINE SPEED TARGET	target engine speed	**500 - 2500 RPM**
ENGINE LOAD RATIO	Engine torque (load ratio)	**0 - 100 %**
P1 PRESS	P1 pressure	**0 - 50 MPa** (**0 - 7253 psi**)
P2 PRESS	P2 pressure	**0 - 50 MPa** (**0 - 7253 psi**)
N1 PRESS	N1 pressure	**0 - 5 MPa** (**0 - 725 psi**)
N2 PRESS	N2 pressure	**0 - 5 MPa** (**0 - 725 psi**)
PUMP1 FLOW RATE	Pump 1 target flow rate	**0 - 100 %**
PUMP2FLOW RATE	Pump 2 target flow rate	**0 - 100 %**
HYD.OIL TEMP	Temperature sensor; hydraulic oil	**-40 - 210 °C** (**-40 - 410 °F**)
COOLANT TEMP	Coolant temperature	**-40 - 210 °C** (**-40 - 410 °F**)
POWER BOOST SOL	Pressure boost solenoid	ON/OFF

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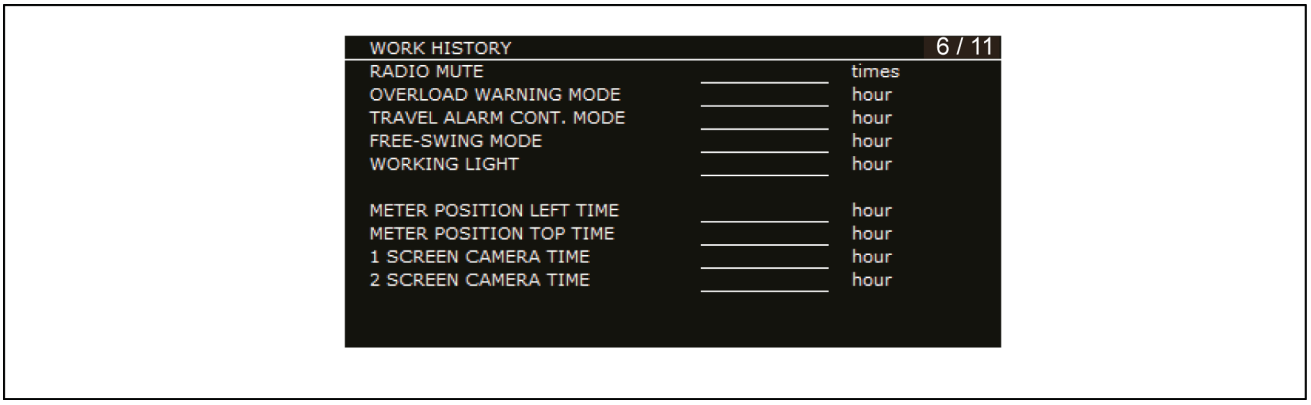

SMIL14CEX0948EA 35

Display	Explanation	Unit	Judgment condition	Judgment start condition
RADIO MUTE	Radio mute ON count	times	Radio mute SW OFF → ON	Key ON
OVERLOAD WARNING MODE	Overload warning mode ON time	hour	Overload SW = ON	Engine in operation
TRAVEL ALARM CONT. MODE	Time during which the travel alarm is in continuous mode	hour	Travel alarm mode SW = ON	Engine in operation
FREE-SWING MODE	Free swing mode ON time	hour	Free swing mode = ON	Engine in operation
WORKING LIGHT	Working light ON time	hour	Working light REL = ON	Key ON
METER POSITION. LEFT TIME	Time during which the gauge was set on the left	hour	When the camera layout on the meter screen is A, B, C, D, and E	Key ON
METER POSITION TOP TIME	Time during which the gauge was set at the top	hour	When the camera layout on the meter screen is F, G, H, I, and J	Key ON
1 SCREEN CAMERA TIME	Camera displaying time with 1 screens	hour	When the camera layout on the meter screen is A, B, C, H, I, and J	Key ON
2 SCREEN CAMERA TIME	Camera displaying time with 2 screens	hour	When the camera layout on the meter screen is D, E, F, and G	Key ON

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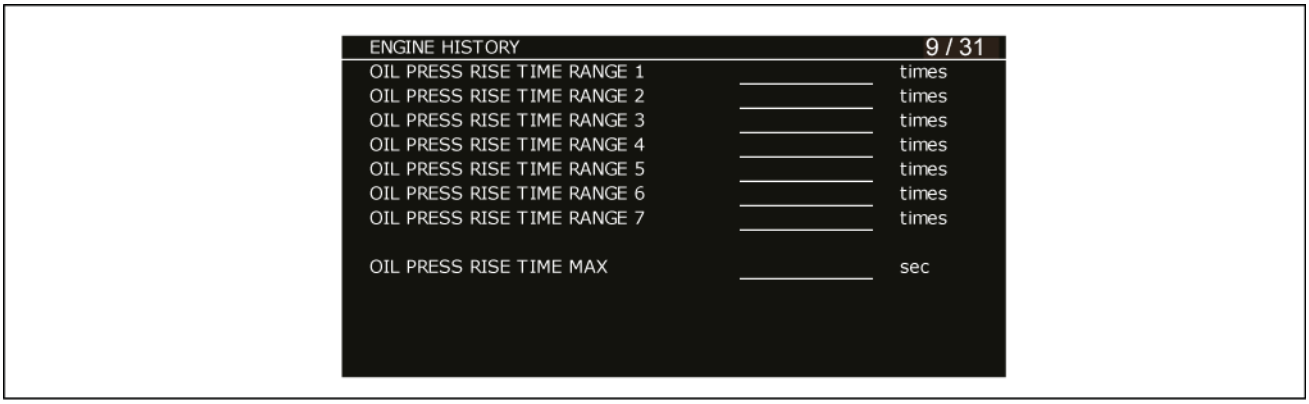


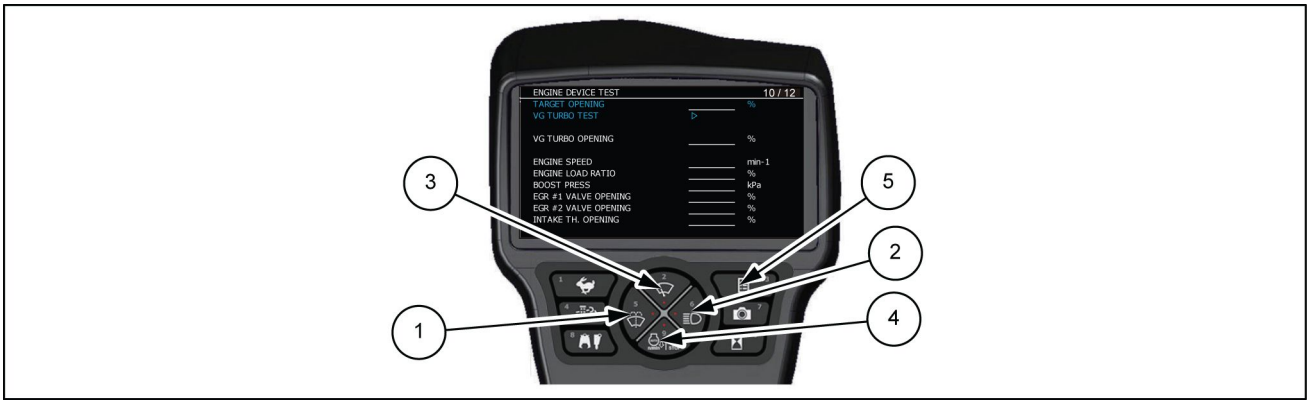
SMIL14CEX0981EA 68

Display	Explanation	Unit	Judgment condition	Judgment start condition
OIL PRESS RISE TIME RANGE 1	Oil pressure rise time; count distribution	times	Less than **2 s**	–
OIL PRESS RISE TIME RANGE 2	Oil pressure rise time; count distribution	times	Less than **5 s**	–
OIL PRESS RISE TIME RANGE 3	Oil pressure rise time; count distribution	times	Less than **8 s**	–
OIL PRESS RISE TIME RANGE 4	Oil pressure rise time; count distribution	times	Less than **10 s**	–
OIL PRESS RISE TIME RANGE 5	Oil pressure rise time; count distribution	times	Less than **15 s**	–
OIL PRESS RISE TIME RANGE 6	Oil pressure rise time; count distribution	times	Less than **30 s**	–
OIL PRESS RISE TIME RANGE 7	Oil pressure rise time; count distribution	times	**30 s** or more	–
OIL PRESS RISE TIME MAX	Maximum value of oil pressure rise time	sec	–	–

VG turbo control test

Purpose

- To check the VG turbo operation.



SMIL14CEX4186EB 100

Display	Explanation	Unit	Remarks
TARGET OPENING	Degree of opening of target VG turbo	%	Items selectable. The degree of opening of the VG turbo can be specified. Initial value: 50.0
VG TURBO TEST	G turbo test	–	The VG turbo is driven (for **10 s**).
VG TURBO OPENING	Degree of opening of EGR #1	%	
ENGINE SPEED	Actual engine speed	min-1 (rpm)	
ENGINE LOAD RATIO	Engine torque (load ratio)	%	
BOOST PRESS	Boost pressure	kPa (psi)	
EGR #1 VALVE OPENING	Degree of opening of EGR #1	%	
EGR #2 VALVE OPENING	Degree of opening of EGR #2	%	
INTAKE TH. OPENING	Intake throttle opening (degree	%	

Condition for the test

- The key is ON, or the engine is running [**1500 RPM** or less].

Set the target VG turbo (%).

- Select "TARGET OPENING" (degree of opening of target VG turbo) using SW **(3)** and **(4)**.
- Press SW **(1)** and **(2)** to set the target test position.
- Available set range: **0 - 100 %**
- After the setting is completed, press SW **(5)**.

Test execution

- Select "VGT TURBO TEST" (VG turbo test) using SW **(3)** and **(4)**.
- Hold down SW **(2)** for **3 s**, then "▷" changes to "▶" and the test starts.
- The test will be continued for **10 s**.

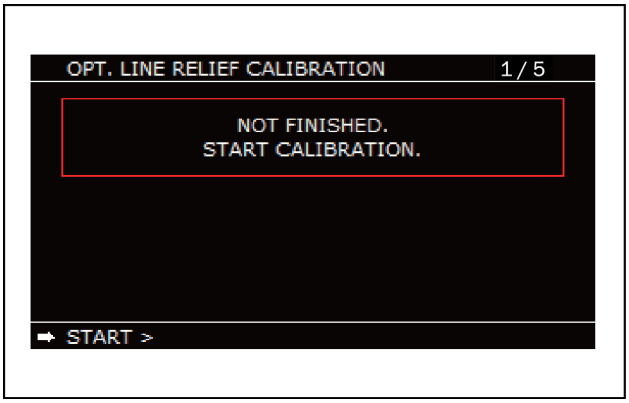
Test finish

- After **10 s**, the engine automatically returns to the normal state.

OPT.line relief

Adjust the option line relief pressure (only applicable for the models with electromagnetic relief valve).
The calibration setup is required when the option relief proportional valve is replaced or the pump is replaced.
This is disabled unless the calibration setup and adjustment for the hydraulic pump are completed in advance. (You cannot enter the screen.)

1. If the relief pressure adjustment is not finished, the (red) initial screen is displayed.



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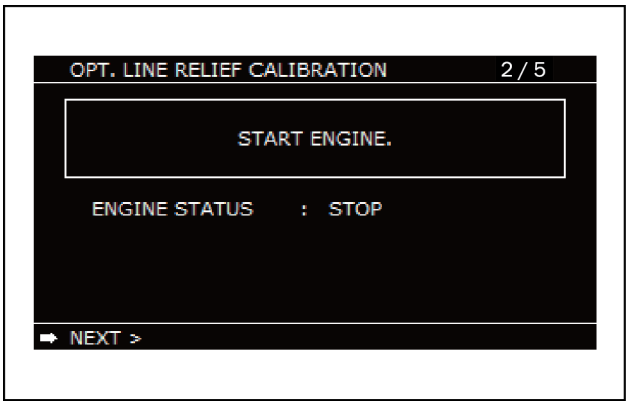
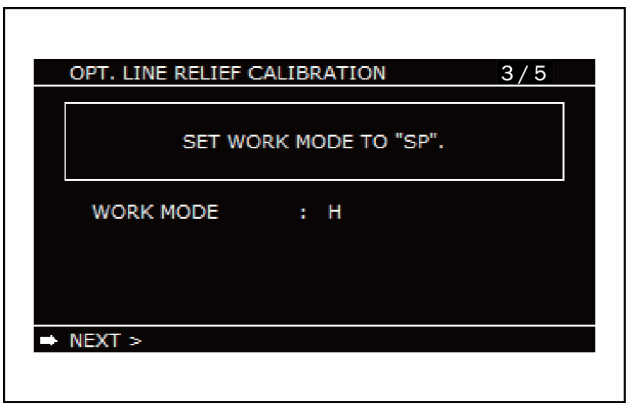
2. When is pressed, the system displays the engine start screen.



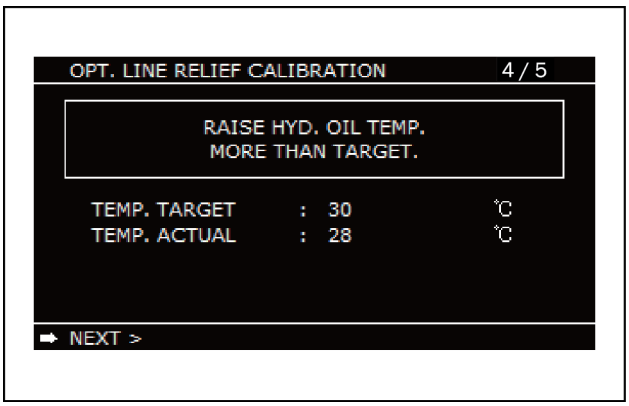
SMIL14CEX6792AA 10

3. When the engine is started and is pressed, the system displays the SP mode screen.



SMIL14CEX6793AA 11

4. When the work mode is turned to the SP mode and is pressed, the system displays the oil temperature raise screen.



SMIL14CEX6794AA 12

Instrument cluster - Adjust - Screen brightness setting

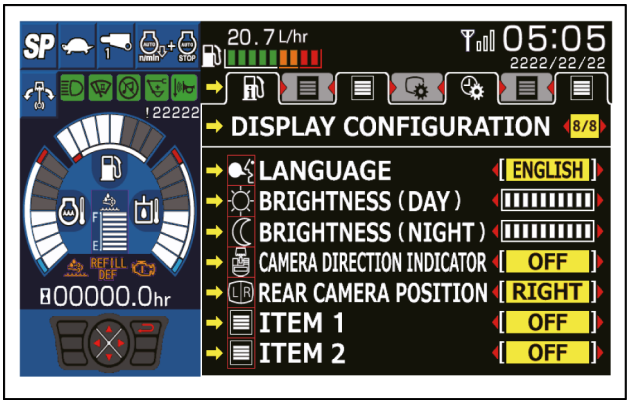
Summary

Brightness of the screen backlight is determined in accordance with the working light and solar radiation sensor.

Operation explanation

The screen brightness when the working light is ON or OFF can be selected on the Display Configuration screen.

1. Working Light OFF: Normal (with key ON), "Brightness (day)" setting
2. Working Light ON: The monitor brightness is reduced and the display automatically changes to the "Brightness (night)" setting.
3. Brightness settings: "Brightness (day)" and "Brightness (night)" can be set on the Display Configuration screen.
4. Dimming by solar radiation sensor: When the working light-linked dimming is set to OFF on the Display Configuration screen, the dimming level is automatically adjusted to the ambient brightness by the solar radiation sensor.



SMIL14CEX0911AB 1

The blow temperature does not go up

Step	Action	Standard value	Yes	No
1	HL. E is displayed on the panel set temperature display section		• The air mix motor actuator connector is disconnected or has a contact defect • Air mix motor actuator defect • Main harness continuity defect Inspect and repair or replace part	Go to Step 2
2	HL. * is displayed on the panel set temperature display section * is No. 0 to 9		• Inside air sensor or harness disconnection or short • The inside air sensor connector is disconnected or has a contact defect See the Monitor Mode section too. Inspect and repair or replace part	Go to Step 3
3	When the set temperature is 32.0 and the blow mode is set to foot mode, the blow temperature rises	**32.0 °C** (**89.6 °F**)	Go to Step 4	Go to Step 5
4	Warm air is flowing into the inside air sensor section		Inspect the duct or eliminate the cause of the warm air infiltration	Computer breakdown or inside air sensor defect Inspect and replace
5	The air mix damper is at the HOTMAX position		Inspect the warm coolant lines	Go to Step 6
6	If motor actuator operation stops midway, remove the cause or correct the problem, and then measure the operating force. Is it **1.5 kgf** or less?	**1.5 kgf** or less	Motor actuator breakdown or controller breakdown Replace	• Inspect, repair, or replace the motor actuator lever link section • Clean the lever link section, and then apply grease

The blower motor does not rotate

Step	Action	Standard value	Yes	No
1	With the flow set to HI, battery voltage is applied to the terminals (+ and -) of the blower motor. (Note: 1)		Replace the blower motor	Go to Step 2
2	The battery voltage is applied between the blower motor (+) power supply red/blue and the body		Go to Step 3	Go to Step 5
3	Voltage of about **10 V** is applied between the blower amp brown/yellow line and ground	About **10 V**	Go to Step 4	Replace computer
4	Remove the blower amp and refer to the section on Blower Amp Inspection. Is there any abnormality? No abnormality → Yes Abnormality → No		Inspect and repair the wire harness	Eliminate the cause of the trouble, and then replace the blower amp

Index

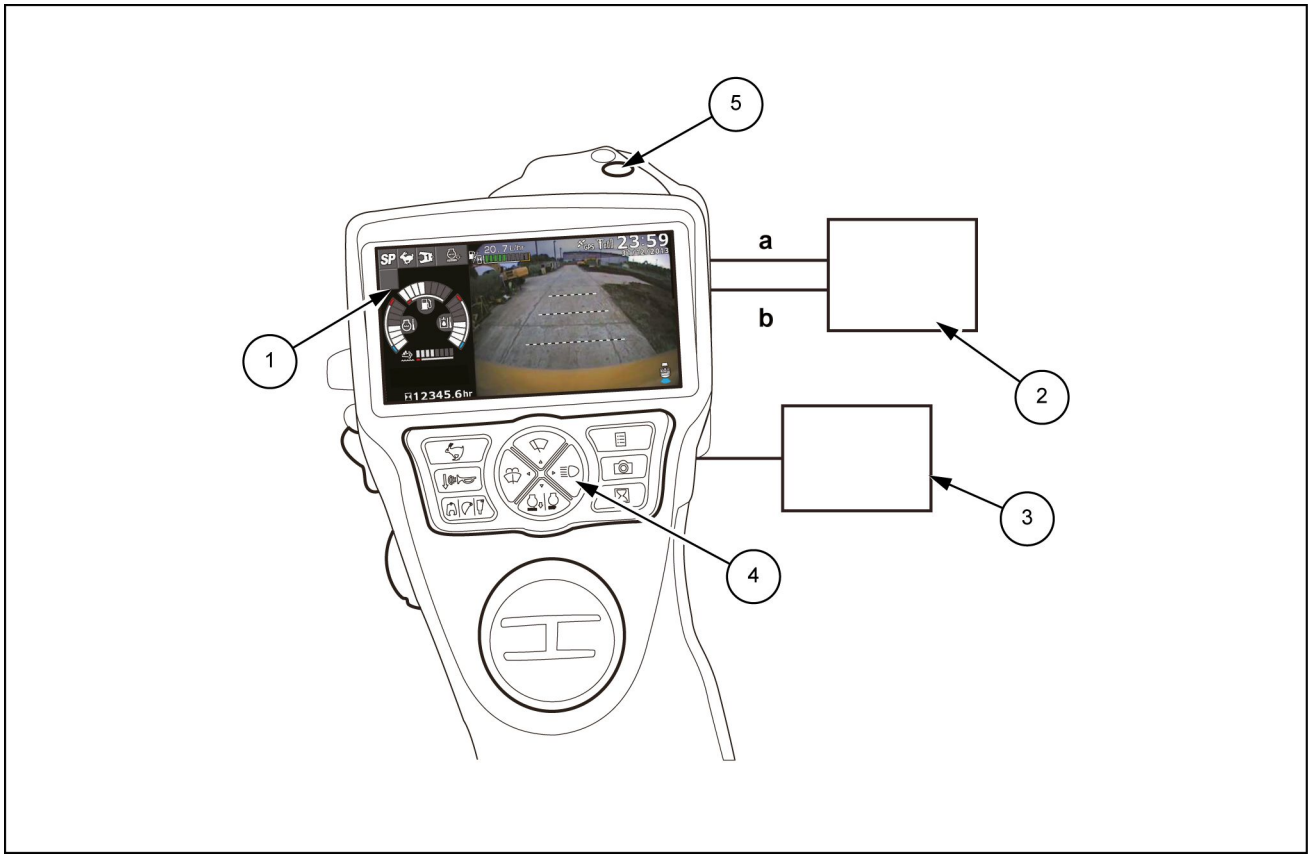
Electrical systems - 55

Heating, Ventilation, and Air-Conditioning (HVAC) control system - 050

Work light - Dynamic description

Purpose/Overview

The working light turns ON/OFF each time the working light switch is pressed. (Improving visibility in night operation)



SMIL14CEX4072FB 1

a. Dimming level automatic adjustment by solar radiation sensor
b. Working light linked dimming by working light relay
1. Monitor
2. Main controller
3. Working light relay
4. Working light switch
5. Solar radiation sensor

Operation

1. The monitor recognizes that an operator presses the working light switch.
2. The monitor sends state of pressing the switch to the controller via CAN communication.
3. The controller controls the working light and then transmits the result of it to the monitor via CAN communication.
4. The monitor activates the working light relay based on received control information to turn on the working light.

Operation condition

When an operator presses the working light switch to turn on the working light:

- The working light icon on the monitor is turned ON.
- Intensity of the back light of the monitor is set to day time brightness.
- Illumination of the switch panel is turned ON.

When an operator presses the working light switch to turn off the working light:

- The working light icon on the monitor is turned OFF.

- *Make sure that there should be no short to the GND circuit.*
- *Make sure that there should be no short to a metal component, such as the frame.*

4. If the CAN circuit is normal, inspect the DCU harness connector **CN.D1-2**.

   NOTE:
   - *Make sure that there should be no intermittent conditions, poor connections, or corrosion.*
   - *Make sure that there should be no water intrusion or adhering foreign material.*

   Replace the DCU. (Refer to **Dosing control unit - Remove (55.988)** and **Dosing control unit - Install (55.988)**)

5. Confirm resolution:

   1. Clear the diagnostic trouble code using the trouble diagnosis scan tool.

      NOTE:
      - *After clearing the DCU diagnostic trouble code, observe whether ECM diagnostic trouble code P20C9 is set.*
      - *If diagnostic trouble code P20C9 is set, clear it.*

   2. Turn OFF the ignition switch until communication with the trouble diagnosis scan tool is discontinued.

   3. Start the engine.

   4. Observe the diagnostic trouble code information with the trouble diagnosis scan tool. A diagnostic trouble code should not be set.

Wiring harnesses - Electrical schematic sheet 12 (55.100) Wiring harnesses - Electrical schematic sheet 06 (55.100) Wiring harnesses - Electrical schematic sheet 15 (55.100)

2049-Urea fluid injector circuit high voltage

Control Module : DCU

Solution:

1. Inspect the injector drive circuit (High) and the injector drive circuit (Low) between the DCU and the dosing module for a short to the battery or a short to the ignition power supply.

   A. If a problem is found, repair the injector drive circuit (High) or (Low).

   B. If there are no problems, proceed to Step **2**

2. Turn OFF the ignition switch.

   Disconnect the dosing module harness connector **CN.D17-3**.

   Inspect the dosing module harness connector **CN.D17-3**.

   NOTE:
   • Make sure that there should be no intermittent conditions, poor connections, or corrosion.
   • Make sure that there should be no water intrusion or adhering foreign material.

   A. If a problem is found, repair the connector **CN.D17-3**.

   B. If there are no problems, proceed to Step **3**

3. Measure the internal resistance between the dosing module connector terminals.

   A. If the reading is outside the specified value range of **11 - 15 Ω** , Replace the dosing module. (Refer to " **Diesel Exhaust Fluid (DEF)/AdBlue® dosing module - Remove (55.988)** and **Diesel Exhaust Fluid (DEF)/AdBlue® dosing module - Install (55.988)**")

   B. If there are no problems, proceed to Step **4**

   NOTE: *When the dosing module is replaced, perform Dosing module data reset with the trouble diagnosis scan tool.*

4. Disconnect the DCU harness connector **CN.D1-2**.

   Inspect the DCU harness connector **CN.D1-2**.

   NOTE:
   • Make sure that there should be no intermittent conditions, poor connections, or corrosion.
   • Make sure that there should be no water intrusion or adhering foreign material.

   A. If a problem is found, repair the harness connector **CN.D1-2**.

   B. If there are no problems, replace the DCU. (Refer to " **Dosing control unit - Remove (55.988)** and **Dosing control unit - Install (55.988)**")

5. Confirm resolution:

   1. Clear the diagnostic trouble code using the trouble diagnosis scan tool.

   NOTE:
   • After clearing the DCU diagnostic trouble code, observe whether ECM diagnostic trouble code P20C9 is set.
   • If diagnostic trouble code P20C9 is set, clear it.

   2. Turn OFF the ignition switch until communication with the trouble diagnosis scan tool is discontinued.

   3. Turn ON the ignition switch without starting the engine.

   4. Observe the diagnostic trouble code information with the trouble diagnosis scan tool. A diagnostic trouble code should not be set.

B. If there are no problems, replace the DCU. (Refer to " **Dosing control unit - Remove (55.988)** and **Dosing control unit - Install (55.988)**")

7. Confirm resolution:

1. Clear the diagnostic trouble code using the trouble diagnosis scan tool.

NOTE:
• After clearing the DCU diagnostic trouble code, observe whether ECM diagnostic trouble code P20C9 is set.
• If diagnostic trouble code P20C9 is set, clear it.

2. Turn OFF the ignition switch until communication with the trouble diagnosis scan tool is discontinued.

3. Turn ON the ignition switch without starting the engine.

4. Observe the diagnostic trouble code information with the trouble diagnosis scan tool. A diagnostic trouble code should not be set.

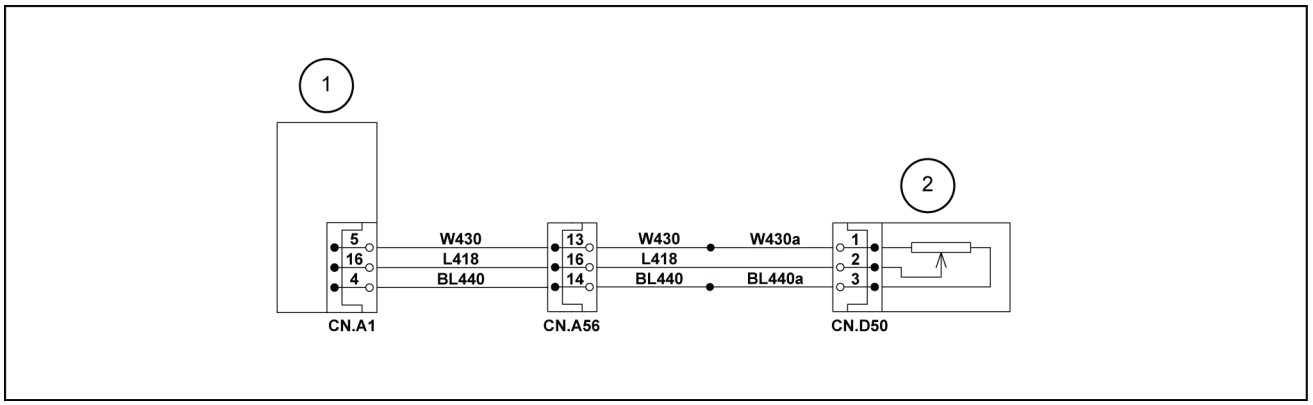
Wiring harnesses - Electrical schematic sheet 15 (55.100)

7001-P2 Pressure sensor signal abnormality

Control Module : MCM

Solution:

1. Use the below image for the fault code resolution process:



SMIL14CEX5188EB 1

1. Main controller
2. (P2) Pressure sensor

Turn the key switch ON.

Inspect the connection status of each connector. Make sure that all the connectors are secured.

A. If diagnostic trouble code 7001 is displayed, proceed to Step **2**.

2. Check the P2 pressure sensor **(2)** connector on the service support screen.

A. If the voltage is more than equal to **4.75 V**, proceed to Step **3**.

B. If the voltage is less than or equal to **0.25 V**, proceed to Step **6**.

3. Turn the key switch OFF and disconnect the P2 pressure sensor **(2)** connector **CN.D50**.

Turn the key switch ON.

Measure the voltage between the ground and terminal 1 of the P2 pressure sensor **(2)** connector **CN.D50** (harness side).

A. If the voltage is not about **5 V**, find and repair the short circuit on the wire ID W430a and W430.

B. If the voltage is about **5 V**, proceed to Step **4**.

4. Measure the voltage between the ground and terminal 2 of the P2 pressure sensor **(2)** connector **CN.D50** (harness side).

A. If the voltage is more than **4.75 V**, find and repair the short circuit on the wire ID L418.

B. If the voltage is less than or equal to **4.75 V**, proceed to Step **5**.

5. Measure the voltage between the ground and terminal 3 of the P2 pressure sensor **(2)** connector **CN.D50** (harness side).

A. If the voltage is more than **0.25 V**, find and repair the short circuit on the wire ID BL440a and BL440.

B. If the voltage is less than or equal to **0.25 V**, replace the main controller **(1)**.

6. Inspect the P2 pressure sensor **(2)**.

Turn the key switch OFF.

6. Measure the voltage between the ground and terminal 3 of the travel 1 pedal pressure sensor **(2) CN.D23-3** (harness side).

   A. If the voltage is more than **0.25 V**, find and replace the short circuit on the wire ID BW445u, BW445m and BW445.

   B. If the voltage is less than or equal to **0.25 V**, replace the main controller **(1)**.

7. Inspect the travel 1 pedal pressure sensor **(2)**.

   Turn the key switch OFF.

   Disconnect travel 1 pedal pressure sensor **(2)** connector **CN.D23-3**.

   Measure the resistance between the terminal 1 and terminal 3 of the travel 1 pedal pressure sensor side **CN.D23-3**.

   A. If the resistance is not about **10 kΩ**, replace the travel 1 pedal pressure sensor **(2)**.

   B. If the resistance is about **10 kΩ**, proceed to Step **8**.

8. Inspect for continuity between the ground and terminal 1 of the travel 1 pedal pressure sensor **(2) CN.D23-3** (harness side).

   Inspect for continuity between the ground and terminal 2 of the travel 1 pedal pressure sensor **(2) CN.D23-3** (harness side).

   A. If there is continuity, find and replace the short circuit on the wire ID WL435u, WL435m, WL435, WB435, O413 and OW413.

   B. If there is no continuity, proceed to Step **9**.

9. Inspect for continuity between the ground and terminal 3 of the travel 1 pedal pressure sensor **(2) CN.D23-3** (harness side).

   A. If there is no continuity, find and repair/replace the open circuit on the wire ID BW445u, BW445m, and BW445.

   B. If there is continuity, proceed to Step **10**.

10. Turn the key switch ON.

    Measure the voltage between the ground and terminal 1 of the travel 1 pedal pressure sensor **(2) CN.D23-3** (harness side).

    A. If the voltage is not about **5 V**, find and repair/replace the open circuit on the wire ID WL435u, WL435m, WL435 and WB435.

    B. If the voltage is about **5 V**, proceed to Step **11**.

11. Measure the voltage between the ground and terminal 2 of the travel 1 pedal pressure sensor **(2) CN.D23-3** (harness side).

    A. If the voltage is less than **0.25 V**, find and repair/replace the open circuit on the wire ID O413 and OW413.

    B. If the voltage is more than or equal to **0.25 V**, replace the main controller **(1)**.

B. If there is no continuity, replace the proportional valve **(2)**.

6. Remove the **CN.A1**.

   Inspect for continuity between the terminal 1of the connector **CN.D64** harness side and terminal 3 of the connector **CN.A1** harness side.

   A. If there is continuity, proceed to Step **7**.

   B. If there is no continuity, repair or replace the L912a harness.

7. Inspect for continuity between the terminal 2 of the connector **CN.D64** harness side and terminal 1of the connector **CN.A1** harness side.

   A. If there is continuity, replace the main controller **(1)**.

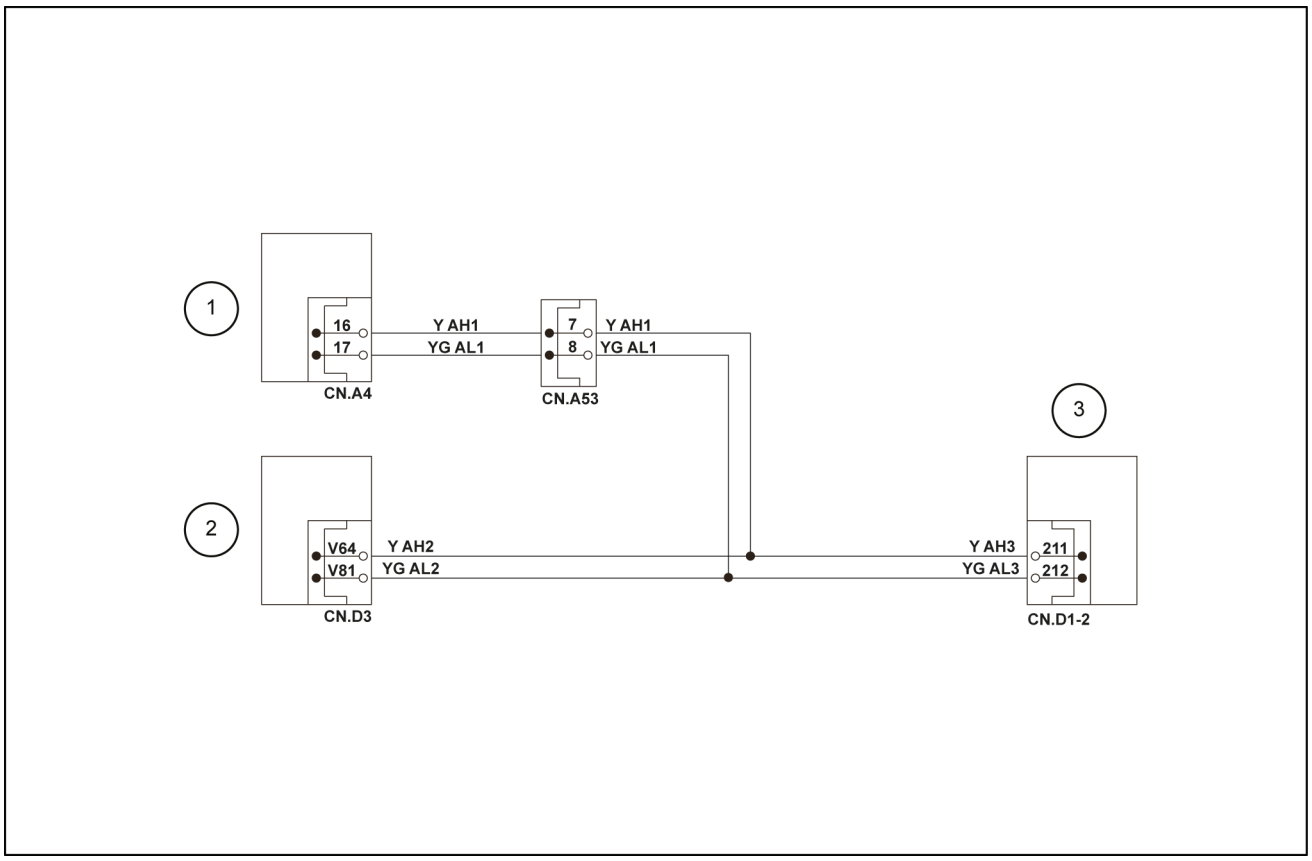
   B. If there is no continuity, repair or replace the BL912b and LY912b harnesses.

7618-DCU Communication Abnormality

Control Module : MCM

Solution:

1. Use the below image for the fault code resolution process:



SMIL14CEX3641FB 1

1. Main controller
2. Engine computer
3. Dosing controller

2. Turn the key switch ON.

   Inspect the connection status of each connector. Make sure that all the connectors are secured.

   A. If diagnostic trouble code 7613 is displayed, proceed to Step **3**.

3. Turn the key switch OFF.

   Disconnect the connectors **CN.A4**, **CN.D3** and CN.D1-2.

   Inspect the continuity between terminal 16 of the connector **CN.A4** harness side and terminal V64 of the connector **CN.D3** harness side and terminal 211 of the connector CN.D1-2 harness side.

   A. If there is continuity, repair or replace the Y AH1, Y AH2, and Y AH3 harnesses.

   B. If there is no continuity, proceed to Step **4**.

4. Inspect the continuity between terminal 17 of the connector **CN.A4** harness side and terminal V81 of the connector **CN.D3** harness side and terminal 212 of the connector CN.D1-2 harness side.

   A. If there is continuity, repair or replace the YG AL1, YG AL2, and YG AL3 harnesses.

NOTE:
• Conditions for setting engine run time or coolant temperature vary depending on the diagnostic trouble codes.
• For the conditions for setting the diagnostic trouble code, refer to the applicable code listed in 15E diagnostic trouble code information.

5. Use the trouble diagnosis scan tool to confirm that a diagnostic trouble code has not been detected.

P0404-EGR control circuit range/performance

Control Module : ECM

Solution:

1. Check and diagnose the below fault codes before you proceed with the diagnostics code P0404.

   Diagnostic trouble code P0409

2. Remove the EGR valve assembly from the engine. (Refer to " **Exhaust Gas Recirculation (EGR) valve - Remove (10.501)**")

   Inspect the EGR valve.

   • Make sure that there is no limit flow inside the EGR valve.

   • Make sure that there is no excessive accumulates inside the EGR valve.

   • Make sure that there is no bending with the valve shaft or valve itself inside the EGR valve.

   Turn OFF the ignition switch.

   Disconnect the harness connector **CN.E03** from the EGR valve.

   Inspect the EGR valve harness connector **CN.D3** for a poor connection.

   A. If a problem is found, repair the harness connector **CN.D3**.

   B. If there are no problems, proceed to Step **3**

3. Disconnect the harness connector **CN.D4** from the ECM.

   Inspect the ECM harness connector **CN.D4** for a poor connection.

   A. If a problem is found, repair the harness connector **CN.D4**.

   B. If there are no problems, proceed to Step **4**

4. Inspect to see if there is an open circuit or high resistance in the EGR control circuit.

   A. If a problem is found, repair the EGR control circuit.

   B. If there are no problems, proceed to Step **5**

5. Inspect the EGR motor circuit between the ECM and EGR valve.

   • Make sure that there is no short to GND.

   • Make sure that there is no short to the battery or ignition power supply circuit.

   • Make sure that there is no short between the circuits.

   • Make sure that there is no short to EGR position sensor circuit.

   A. If a problem is found, repair the EGR motor circuit.

   B. If the EGR motor circuit is normal, replace the EGR valve. (Refer to " **Exhaust Gas Recirculation (EGR) valve - Remove (10.501)** and **Exhaust Gas Recirculation (EGR) valve - Install (10.501)**")

   C. If there are no problems, proceed to Step **6**

6. Restore the machine.

   Turn ON the ignition switch.

   Clear the diagnostic trouble code using the trouble diagnosis scan tool.

P06A8-Sensor reference voltage 3 circuit

Control Module : ECM

Solution:

1. Turn OFF the ignition switch.

   Disconnect the harness connector P275 from the boost pressure sensor.

   Turn ON the ignition switch.

   Measure the voltage between the boost pressure sensor **5 V** power supply circuit of the boost pressure sensor harness connector P275 and the GND.

   If the reading is more than or equal to **5.5 V**, inspect the boost pressure sensor **5 V** power supply circuit between the ECM and the boost pressure sensor for a short to the battery or a short to the ignition power supply.

   A. If a problem is found, repair the boost pressure sensor **5 V** power supply circuit.

   B. If there are no problems, proceed to Step **2**.
2. Inspect the intake throttle position sensor **5 V** power supply circuit between the ECM and intake throttle position sensor for a short to the battery or a short to the ignition power supply.

   A. If a problem is found, repair the intake throttle position sensor **5 V** power supply circuit.

   B. If there are no problems, proceed to Step **3**.
3. If the reading is less than or equal to **5.5 V**, measure the voltage between the boost pressure sensor **5 V** power supply circuit of the boost pressure sensor harness connector P275 and the GND.

   If the reading is more than or equal to **4.5 V**, replace the boost pressure sensor. (Refer to " **Boost pressure sensor - Remove (55.014)** and **Boost pressure sensor - Install (55.014)**")

   If the reading is less than or equal to **4.5 V**, turn OFF the ignition switch.

   Disconnect the harness connector **CN.B2** from the intake throttle position sensor.

   Turn ON the ignition switch.

   Measure the voltage between the boost pressure sensor **5 V** power supply circuit of the boost pressure sensor harness connector P275 and the GND.

   If the reading is more than or equal to **4.5 V**, replace the intake throttle valve. (Refer to " **Intake manifold - Remove – Intake throttle valve (10.254)** and **Intake manifold - Install – Intake throttle valve (10.254)**")

   If the reading is less than or equal to **4.5 V**, inspect the boost pressure sensor **5 V** power supply circuit between the ECM and the boost pressure sensor for a short to GND.

   A. If a problem is found, repair the boost pressure sensor **5 V** power supply circuit.

   B. If there are no problems, proceed to Step **4**.
4. Inspect the intake throttle position sensor **5 V** power supply circuit between the ECM and intake throttle position sensor for a short to GND.

   A. If a problem is found, repair the intake throttle position sensor **5 V** power supply circuit.

   B. If there are no problems, proceed to Step **5**.
5. Replace the ECM. (Refer to " **Engine Control Unit (ECU) - Remove (55.015)** and **Engine Control Unit (ECU) - Install (55.015)**")

   Set the Injector ID Code, fuel delivery rate and engine No. for the ECM.
6. Confirm resolution:

P2123-Pedal position sensor 1 circuit high input

Control Module : ECM

Solution:

1. Check and diagnose the below fault codes before you proceed with the diagnostics code P2123.

   Diagnostic trouble code P06A6

2. Turn OFF the ignition switch.

   Disconnect the harness connector **CN.B2** from the accelerator position sensor.

   Observe the accelerator pedal sensor 1 display on the trouble diagnosis scan tool.

   If the reading is more than or equal to the **0.1 V**, inspect the sensor 1 signal circuit between the ECM and the accelerator position sensor.

   • Make sure that there is no short to the battery or ignition power supply.

   • Make sure that there is no short to the **5 V** power supply.

   A. If a problem is found, repair the sensor 1 signal circuit.

   B. If there are no problems, proceed to Step **3**

3. Connect the test light between the accelerator position sensor GND circuit and battery power supply.

   A. If the test light comes on, inspect the accelerator position sensor harness connector **CN.B2** for a poor connection.

   B. If a problem is found, repair the harness connector **CN.B2**.

   C. If the harness connector **CN.B2** is normal, replace the accelerator position sensor.

   D. If the test light does not come on, inspect to see if there is an open circuit or high resistance with the GND circuit between the ECM and the accelerator position sensor.

   E. If a problem is found, repair the GND circuit.

   F. If there are no problems, proceed to Step **4**

4. Inspect the ECM harness connector **CN.A1** for a poor connection.

   A. If a problem is found, repair the harness connector **CN.A1**.

   B. If the harness connector **CN.A1** is normal, replace the ECM. (Refer to " **Engine Control Unit (ECU) - Remove (55.015)** and **Engine Control Unit (ECU) - Install (55.015)**")

5. Set the Injector ID Code, fuel delivery rate and engine number for the ECM.

6. Confirm resolution:

   1. Clear the diagnostic trouble code using the trouble diagnosis scan tool.

   2. Turn OFF the ignition switch for at least **30 s**.

   3. Start the engine and fully depress and release the accelerator pedal while observing the accelerator pedal sensor 1 display on the trouble diagnosis scan tool.

   4. Confirm that the trouble diagnosis scan tool does not show a value at or above the specified value while depressing and then releasing the pedal.

   5. Use the trouble diagnosis scan tool to confirm that a diagnostic trouble code has not been detected.

U2106-Lost CAN communications with wheel loader transmission control system

Control Module : ECM

Solution:

1. Turn OFF the ignition switch.

   Inspect the CAN circuit between the machine control unit and the ECM for a short circuit, an open circuit, or high resistance.

   A. If a problem is found, repair the applicable circuit.

   B. If there are no problems, proceed to Step **2**
2. Inspect for poor connections at the harness connector **CN.A4**.

   A. If a problem is found, repair the harness connector **CN.A4**.

   B. If there are no problems, proceed to Step **3**
3. Inspect for poor connections at the ECM harness connector **CN.D3**.

   A. If a problem is found, repair the harness connector **CN.D3**.
4. Confirm resolution:

   1. Clear the diagnostic trouble code using the trouble diagnosis scan tool.

   2. Turn OFF the ignition switch for at least **30 s**.

   3. Start the engine.

   4. Perform a test-run under the conditions for running the diagnostic trouble code.

   NOTE:
   • Conditions for setting engine run time or coolant temperature vary depending on the diagnostic trouble codes.
   • For the conditions for setting the diagnostic trouble code, refer to the applicable code listed in 15E diagnostic trouble code information.

   5. Observe the diagnostic trouble code information with the trouble diagnosis scan tool.

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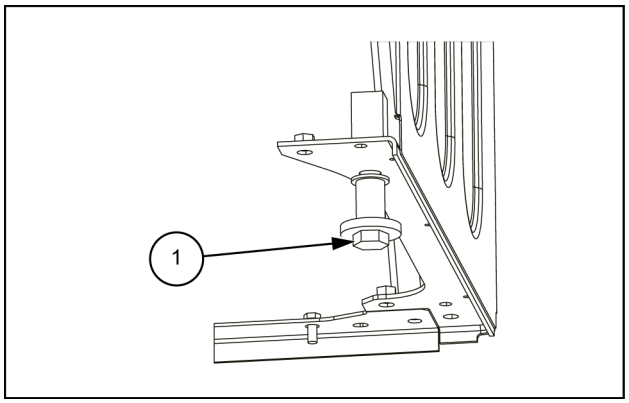
18. Remove the anchor bolt **(1)** with a wrench [**41 mm**].



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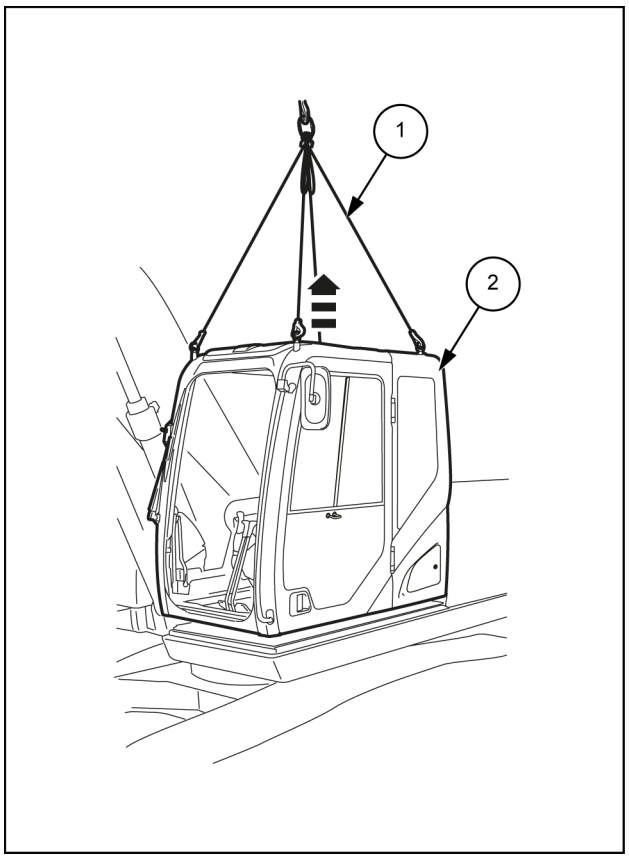
19. Remove the cab **(2)** by lifting it with a chain **(1)** and liftcrane.



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