WSM

WORKSHOP MANUAL

TRACTOR

M5091,M5111

Kubota

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CONTENTS

1. SAFETY

SAFETY FIRST 1-1
1. Preparing for emergencies 1-1
2. Working cautions 1-1
3. Starting machine safely 1-2
4. Preventing fires 1-2
5. Preventing acid burns 1-3
6. Avoiding high pressure fluid 1-3
7. Avoiding hot exhaust 1-3
8. Cleaning exhaust filter 1-4
SAFETY LABELS 1-5
1. ROPS model 1-5
1.1 Safety labels 1-5
2. Cabin model 1-9
2.1 Safety labels 1-9
3. Care of danger, warning and caution labels 1-14

2. GENERAL

GENERAL WORKING INSTRUCTIONS 2-1
1. General working precautions 2-1
2. Tightening bolts and nuts 2-1
3. Applying thread-locking fluid 2-1
4. Installing circlips 2-2
5. Installing spring pins 2-2
6. Handling split pin 2-2
7. Handling chain joint and split pin 2-2
8. Handling liquid gasket 2-3
9. Replacing O-rings 2-3
10. Replacing oil seals 2-3
11. Replacing floating seals 2-4
12. Connecting hydraulic hoses 2-4
13. Wrapping thread seal tape 2-4
14. Installing elbows with male seat 2-4
15. Connecting and disconnecting quick hose couplings 2-5
16. Handling the battery 2-5

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SAFETY FIRST

This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and on labels on the machine itself to warn of the possibility of personal injury. Read these instructions carefully. It is essential that you read the instructions and safety regulations before you attempt to assemble or use this unit.

⚠ DANGER
- **Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

⚠ WARNING
- **Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.**

⚠ CAUTION
- **Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.**

■ IMPORTANT
- **Indicates that equipment or property damage could result if instructions are not followed.**

■ NOTE
- **Gives helpful information.**

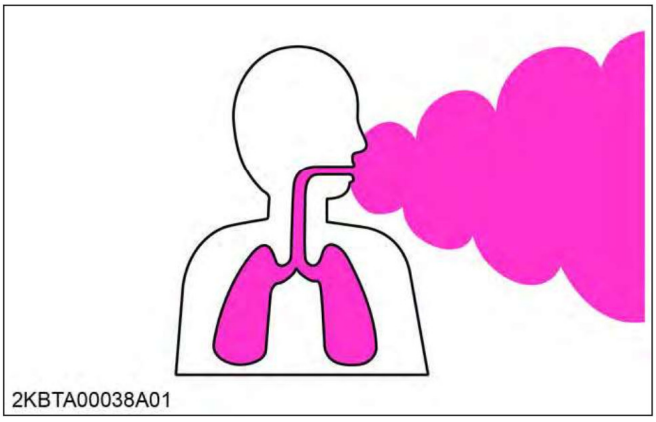
1. Preparing for emergencies



2. Working cautions



- Wear proper service attire when performing work. Do not wear loose clothing as they could get caught on machine components.
- Wear the proper protective equipment when working around the machine. For example helmet, eye protector and protective shoes.
- Do not work around the machine if you are tired or have consumed alcohol or drugs.



- Keep the machine away from obstacles and hazardous materials.
- Ensure the working environment is properly ventilated.
- Do not allow third parties to come near the machine.

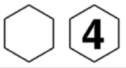
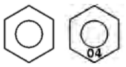
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TIGHTENING TORQUES

Refer to the following table if the tightening torques of screws, bolts and nuts are not specified in each part.

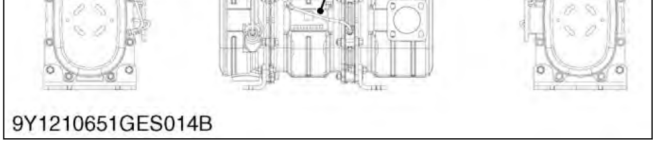
1. General use screws, bolts and nuts

Indication on top of bolt	 No-grade or 4T					
Indication on top of nut	 No-grade or 4T					
Material of opponent part	Ordinariness			Aluminum		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M6	7.9 to 9.3	0.80 to 0.95	5.8 to 6.8	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5
M8	18 to 20	1.8 to 2.1	13 to 15	17 to 19	1.7 to 2.0	13 to 14
M10	40 to 45	4.0 to 4.6	29 to 33	32 to 34	3.2 to 3.5	24 to 25
M12	63 to 72	6.4 to 7.4	47 to 53	—	—	—
M14	108 to 125	11.0 to 12.8	79.6 to 92.5	—	—	—
M16	167 to 191	17.0 to 19.5	123 to 141	—	—	—
M18	246 to 284	25.0 to 29.0	181 to 209	—	—	—
M20	334 to 392	34.0 to 40.0	246 to 289	—	—	—

Indication on top of bolt	 7T					
Indication on top of nut	 No-grade or 4T					
Material of opponent part	Ordinariness			Aluminum		
Unit	N·m	kgf·m	lbf·ft	N·m	kgf·m	lbf·ft
M6	9.81 to 11.2	1.00 to 1.15	7.24 to 8.31	7.9 to 8.8	0.80 to 0.90	5.8 to 6.5
M8	24 to 27	2.4 to 2.8	18 to 20	18 to 20	1.8 to 2.1	13 to 15
M10	48 to 55	4.9 to 5.7	36 to 41	40 to 44	4.0 to 4.5	29 to 32
M12	78 to 90	7.9 to 9.2	58 to 66	63 to 72	6.4 to 7.4	47 to 53
M14	124 to 147	12.6 to 15.0	91.2 to 108	—	—	—
M16	197 to 225	20.0 to 23.0	145 to 166	—	—	—
M18	275 to 318	28.0 to 32.5	203 to 235	—	—	—
M20	368 to 431	37.5 to 44.0	272 to 318	—	—	—

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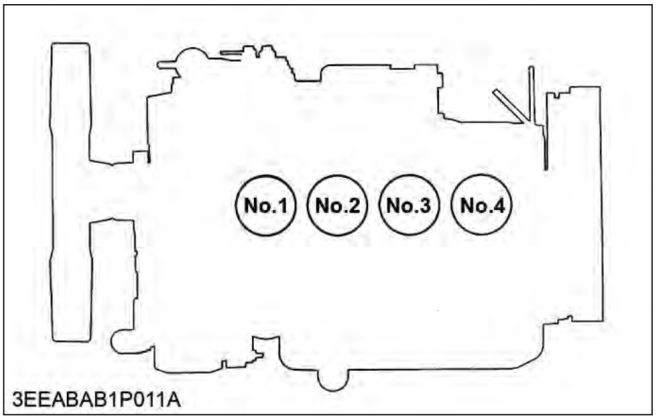
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9Y1210651GES014B

(1) DPF muffler full assembly part number and serial number
(2) Body (DPF outlet) part number and serial number
(3) Filter comp (DPF) part number and serial number
(4) Catalyst (DOC) part number and serial number

1.4 Cylinder number

You can see the cylinder numbers of Kubota diesel engine in the figure.



3EEABAB1P011A

The sequence of cylinder numbers is No. 1, No. 2, No. 3 and No. 4.
The cylinder number starts from the gear case side.

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2. Specifications

2.1 ROPS model

2.1.1 Specification table

Model			M5091	M5111
			4WD	4WD
Engine	Model		V3800-CR-TE4-G7	V3800-CR-TIE4-G7
	Type		4-cylinder inline, common rail system, direct injection	4-cylinder inline, common rail system, direct injection, intercooler
	Number of cylinders		4	
	Total displacement	cm^3	3769	
	Bore and stroke	mm	100 x 120	
	Rated revolution	rpm	2400	
	Low idling revolution	rpm	800 to 850	
	Rated engine HP (97/68/EC)	kW (HP)	68.6 (92)	76.7 (103)
	Net power *1	kW (HP)	65.6 (88)	73.7 (98.8)
	Maximum torque	N·m/rpm	320.0/1500	346.1/1500
	Battery capacity		12 V, RC: 160 min, CCA 900 A	
	Fuel tank capacity	L	105	

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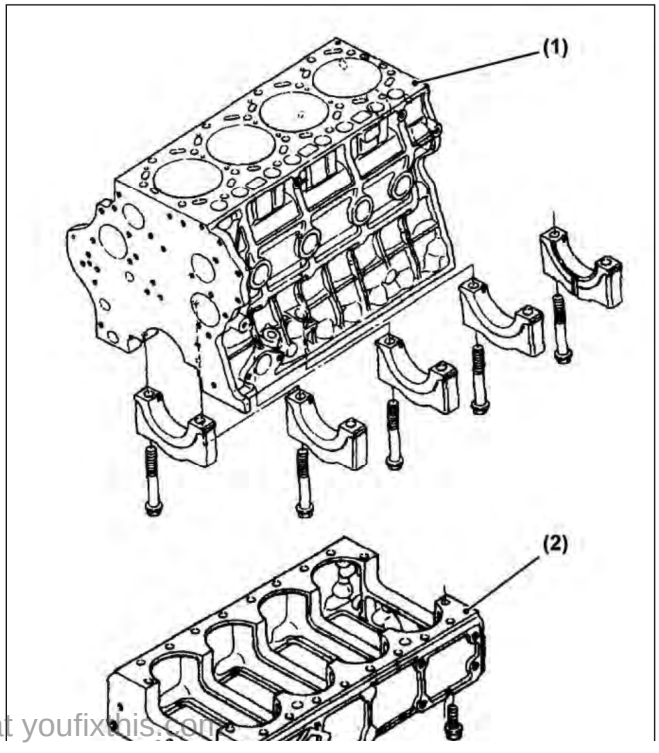
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MECHANISM

1. Engine

1.1 Feature of cylinder block

The engine uses a split crankcase to produce greater durability and operate more quietly; the crankcase is split into two parts, crankcase 1 (1), which houses the parts for combustion and crankcase 2 (2), which completes crankcase 1 and produces low-noise.
It uses a hanger type of crankshaft support which allows for easy dis/assembly and the lining of the cylinder is a linerless type, which offers good cooling performance and excellent resistance to wear as it is little affected by distortion.



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2. Service specifications for engine

Engine body

Item		Service specification	Service limit
Compression pressure		3.09 to 3.28 MPa / 200 min^{-1} (rpm) 31.5 to 33.5 kgf/cm^2 / 200 min^{-1} (rpm) 448 to 476 psi / 200 min^{-1} (rpm)	2.41 MPa / 200 min^{-1} (rpm) 24.6 kgf/cm^2 / 200 min^{-1} (rpm) 350 psi / 200 min^{-1} (rpm)
Valve clearance (Cool)		0.23 to 0.27 mm 0.0091 to 0.010 in.	—
Positive terminal	clearance	1.0 to 1.5 mm 0.040 to 0.059 in.	—
Crankshaft position sensor	Air gap	0.25 to 1.4 mm 0.0099 to 0.055 in.	—
Top clearance		0.701 to 0.930 mm 0.0276 to 0.0366 in.	—
Cylinder head surface	Flatness	—	0.05 mm 0.002 in.
Valve recessing	Intake	0.60 to 0.80 mm 0.024 to 0.031 in.	1.2 mm 0.047 in.
	Exhaust	0.850 to 1.05 mm 0.0335 to 0.0413 in.	1.2 mm 0.047 in.
Valve stem to valve guide	Clearance (Intake)	0.035 to 0.065 mm 0.0014 to 0.0025 in.	0.1 mm 0.004 in.
• Valve stem	O.D. (Intake)	6.960 to 6.975 mm	—

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SERVICING

1. Troubleshooting for engine

This troubleshooting shows only mechanical failures.
The failures related to the Common Rail System (CRS), and DPF, refer to the Diagnosis Manual (DM) for common rail system engine (*9Y120-03140*).

Symptom	Probable cause and checking procedure	Solution	Reference page
The engine does not start	1. No fuel	Fill up the fuel	3-5
	2. Air in the fuel system	Bleed the air	—
	3. Water in the fuel system	Change the fuel and repair or replace the fuel system	3-36
	4. The fuel pump is damaged	Replace	—
	5. The fuel hose is clogged	Clean or replace	3-36
	6. The fuel filter is clogged	Replace	3-22
	7. The viscosity of fuel at low temperature is too high	Replace the specified fuel	3-5
	8. The cetane number of fuel is low	Replace the specified fuel	3-5
	9. Fuel leakage because of loose injection pipe retaining nut	Tighten the retaining nut	4-74
	10. The injector is clogged	Replace	4-78
	11. The supply pump is damaged	Replace	4-85
	12. Seizure of the crankshaft, camshaft, piston or bearing	Repair or replace	—
	13. Compression leakage from the cylinder	Replace the head gasket Tighten the cylinder head screw	4-81 4-82
	14. Incorrect valve timing	Check the timing gear	4-97
	15. Piston ring and cylinder are worn out	Replace	4-111 4-111 4-115
	16. Incorrect valve clearance	Adjust valve clearance	3-27

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SERVICE INTERVALS

	Interval	Items		Ref. page	
A	initial 50 Hr	Engine oil	Change	3-12	
		Engine oil filter	Re-place	3-12	
B	every 50 Hr	Engine start system	Check	3-12	
		Wheel bolt torque	Check	3-13	
		Tie-rod dust cover	Check	3-13	
C	every 100 Hr	Greasing	—	3-13	
		Air cleaner primary ele-ment	Clean	3-15	*1
		Fan belt	Adjust	3-15	
		Brake pedal	Adjust	3-16	
		Gear-locked parking brake	Check	3-16	
		Parking brake	Adjust	3-17	
		Battery condition	Check	3-17	*2
		Air conditioner drive belt	Adjust	3-18	
D	every 200 Hr	Toe-in	Adjust	3-19	
		Fuel tank water	Drain	3-19	
		Inner air filter	Clean	3-19	
		Fresh air filter	Clean	3-20	*3
E	every 400 Hr	Water separator	Clean	3-20	
F	every 500 Hr	Engine oil	Change	3-21	*4
		Engine oil filter	Re-place	3-21	*4
		Fuel filter	Re-place	3-22	
		Hydraulic oil filter	Re-place	3-22	
		Power steering oil line	Check	3-23	*5
		Radiator hose and clamp	Check	3-23	*5
		Fuel line	Check	3-24	*5
		Intake air line	Check	3-24	*5
		Lift cylinder hose	Check	3-25	*5

	Interval	Items		Ref. page	
H	every 1000 Hr	Transmission fluid	Change	3-26	
		Front differential case oil	Change	3-27	
		Front axle gear case oil	Change	3-27	
		Engine valve clearance	Adjust	3-27	
I	every 1000 Hr or 1 year*6	Air cleaner primary ele-ment	Re-place	3-28	
		Air cleaner secondary element	Re-place	3-28	
		Exhaust manifold	Check	3-29	
		Fresh air filter	Re-place	-	
J	every 1500 Hr	Fuel injector nozzle tip	Check	3-29	
		EGR cooler	Check Clean	3-29	
K	every 2000 Hr or 2 years*7	Cooling system	Flush	3-30	
		Coolant	Change	3-31	
L	every 3000 Hr	Turbocharger	Check	3-31	
		Supply pump	Check	3-32	
		Intake air heater	Check	3-32	
		EGR system	Check Clean	3-32	
		DPF muffler	Clean	3-33	
M	every 1 year	CAB isolation cushion	Check	3-33	
		DPF related pipe	Check	3-33	
		EGR pipe	Check	3-33	
N	every 2 years	Breather related rubber pipe	Re-place	3-33	
		Boost sensor hose	Re-place	3-34	
		DPF related rubber pipe	Re-place	3-34	
		EGR cooler hose	Re-place	3-34	
		Master cylinder filter	Clean	3-34	

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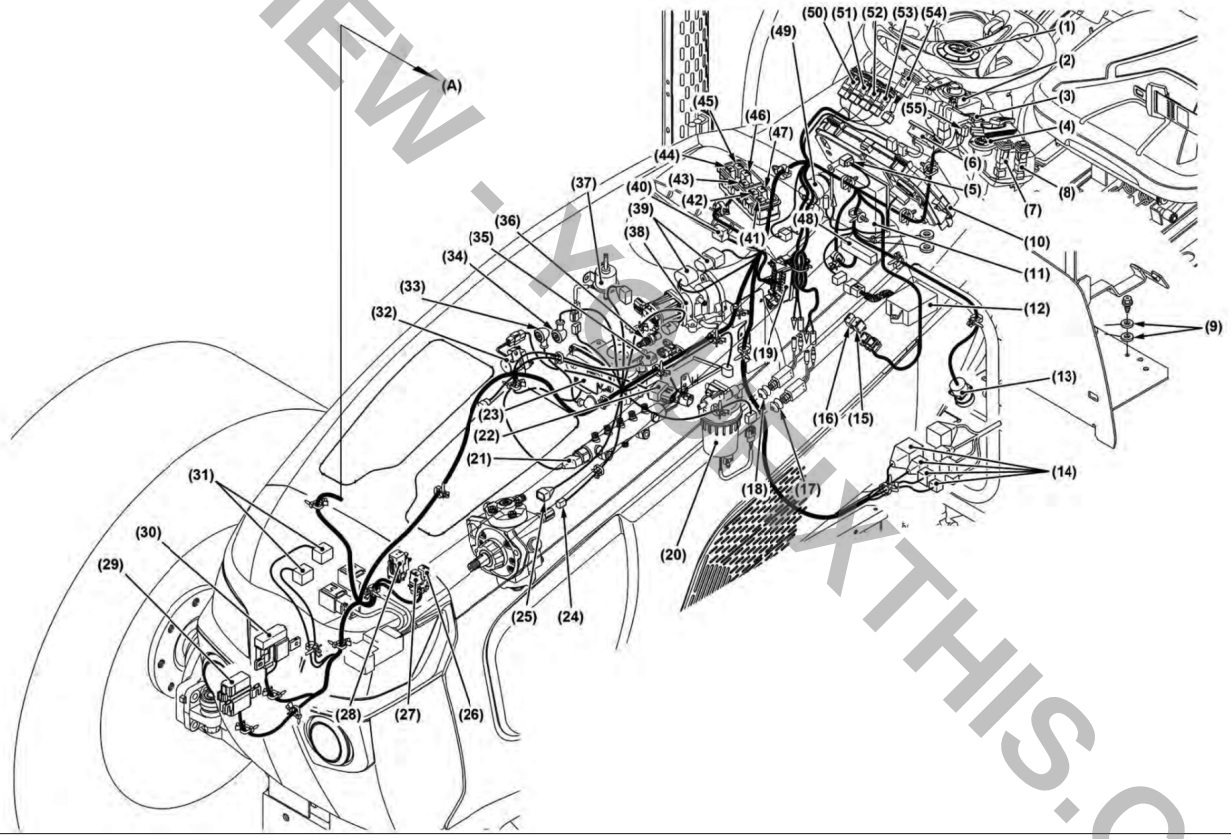
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MECHANISM

. Location of electrical components

.1 ROPS model

.1.1 Electrical component location on main harness 1



TCXX00013A01

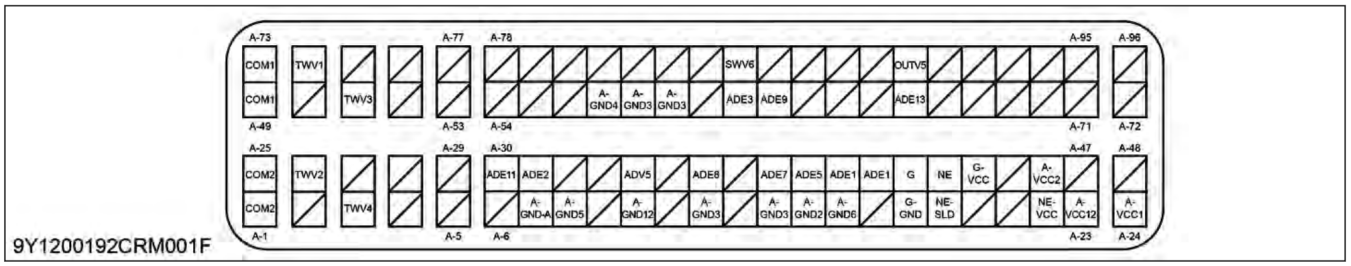
) Horn switch
) Combination switch
) Shuttle switch
) Shuttle sensor
) Diode
) Meter select switch
) Auto differential lock switch
) Hazard light switch
(9) Grounding
(10) Meter panel
(11) Tractor ECU
(12) Flasher unit
(13) K-OBD connector
(14) Connectors to body harness
(15) Trailer brake gear lock parking relay
(16) Trailer brake secondary brake relay
(17) Brake switch (L.H.)
(18) Brake switch (R.H.)
(19) Fuse box 1
(20) Water separator
(21) Rail pressure sensor
(22) Connector to injector harness
(23) Intake throttle valve
(24) Fuel temperature sensor
(25) SCV connector
(26) CRS relay 2
(27) CRS relay 1
(28) Starter relay
(29) Slow blow fuse box 2
(30) Slow blow fuse box 1
(31) Connector to battery
(32) Intake air heater relay
(33) Intake air heater cable
(34) Connector to intake air heater
(35) Boost pressure sensor
(36) Coolant temperature sensor
(37) Feed pump
(38) EGR valve
(39) Check connector
(40) Connector to front loader
(41) Brake detect relay
(42) Head light relay
(43) PTO safety relay
(44) Auxiliary power relay
(45) Work light relay
(46) Neutral relay
(47) Stop lamp relay
(48) J/C 3
(49) Main switch
(50) Front work lamp switch
(51) Constant RPM management switch
(52) DPF INHIBIT switch
(53) Parked regeneration switch
(54) 4WD switch
(55) Horn switch
(A) To main harness 2

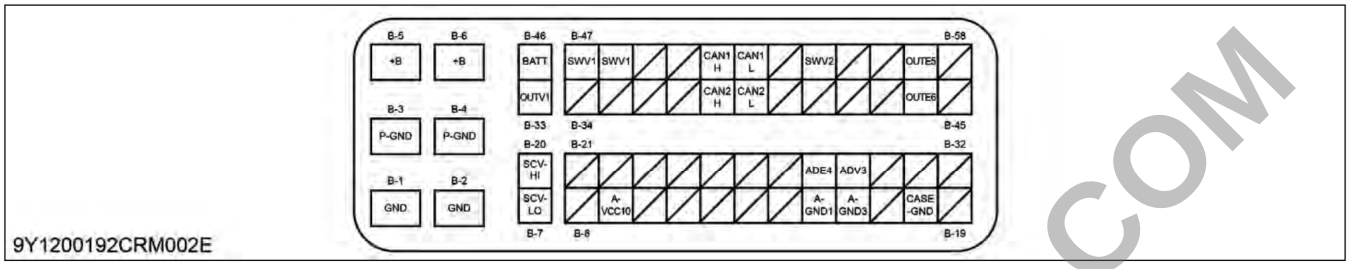
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5.9 Engine ECU

5.9.1 Terminal position of engine ECU





[A] Engine ECU connector A [B] Engine ECU connector B

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ion	Reference value	WSM link page
	–	–
not drive	–	–
	–	Checking wire harness conduction for shuttle switch: 11-117
	–	Checking wire harness conduction for shuttle switch: 11-117
	–	Checking PTO, 2WD and rear differential lock solenoid valve: 5-124
	–	Checking PTO, 2WD and rear differential lock solenoid valve: 5-124
	–	–
	–	–
	–	–
	–	–
	–	–
	F position: below 1.73 V R position: above 3.27 V	Shuttle lever sensor: 11-150
	F position: below 1.73 V R position: above 3.27 V	Shuttle lever sensor: 11-150
	3.85 V < MAIN + SUB < 6.15 V	Shuttle lever sensor: 11-150
	F position: above 3.27 V R position: below 1.73 V	Shuttle lever sensor: 11-150
	F position: above 3.27 V R position: below 1.73 V	Shuttle lever sensor: 11-150
	–	Checking PTO, 2WD and rear differential lock solenoid valve: 5-124
	–	Checking PTO, 2WD and rear differential lock solenoid valve: 5-124
ed is limit-	6-speed position: switch signal is Open Other position: switch signal is +B	Main gear shift (6th) switch: 11-130

(Continued)

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SERVICING
2. Diagnostic trouble code (DTC)

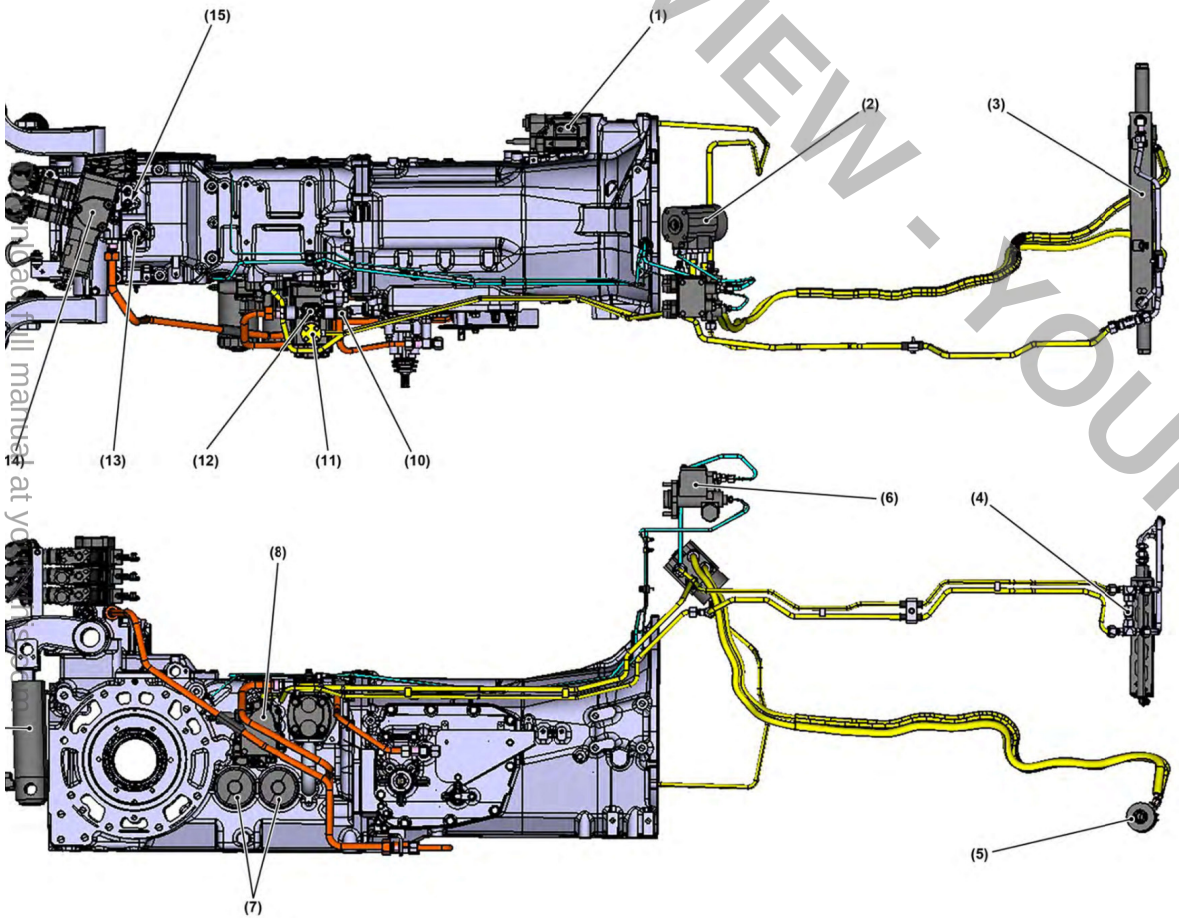
2. Diagnostic trouble code (DTC)

2.1 Diagnostic trouble code for VCU

SPN	FMI	Error code	Problem description	DTC set parameter	Probable cause	DTC set precondition	S
70	14	ERROR-8	Parking brake switch signal error	Switch signal error Position by gear lock parking lever switch signal and position by gear lock parking brake switch signal is different	1. Fix position of gear lock parking lever switch or/and gear lock parking brake switch inappropriate 2. Gear lock parking lever switch or/and gear lock parking brake switch malfunction 3. Cable disconnection or/and short to ground/power supply line	Anytime during key on	Can not
91	3	ERROR-1	Throttle sensor (MAIN) voltage High	Main voltage High Voltage > 4.9 V	1. Short to power supply line 2. Fix position of throttle sensor inappropriate 3. Throttle sensor malfunction 4. Cable disconnection	Anytime during key on	Engine id
91	4	ERROR-1	Throttle sensor (MAIN) voltage Low	Main voltage Low Voltage < 0.2 V	1. Short to ground line 2. Fix position of throttle sensor inappropriate 3. Throttle sensor malfunction	Anytime during key on	Engine id
91	8	ERROR-3	Throttle sensor phase shifting trouble	Phase shifting trouble MAIN + SUB ≥ 6.15 V MAIN + SUB ≤ 3.85 V	1. Short to power supply or ground line 2. Fix position of throttle sensor inappropriate 3. Throttle sensor malfunction 4. Cable disconnection	Anytime during key on	Engine id
604	14	ERROR-7	Shuttle sensor or switch signal error	Signal error Position by sensor signal and position by switch signal is different	1. Fix position of shuttle sensor or/and shuttle neutral switch inappropriate 2. Shuttle sensor or/and shuttle neutral switch malfunction 3. Cable disconnection or/and short to ground/power supply line	Anytime during key on	Can not
741	4	ERROR-14	Shuttle forward solenoid valve short to ground	Short to ground	1. Short to ground line 2. Solenoid valve malfunction	Anytime during engine on	Can not
741	5	ERROR-14	Shuttle forward solenoid valve open circuit	Open circuit	1. Solenoid valve malfunction 2. Cable disconnection	Anytime during key on	Can not
746	4	ERROR-17	Differential lock solenoid valve short to ground	Short to ground	1. Short to ground line 2. Solenoid valve malfunction	Anytime during engine on	Unavaila
746	5	ERROR-17	Differential lock solenoid valve open circuit	Open circuit	1. Solenoid valve malfunction 2. Cable disconnection	Anytime during key on	Unavaila
778	3	ERROR-21	Range gear shift High switch voltage High	Voltage High Traveling gear and gear switch signal is different	1. Switch malfunction 2. Short to power supply line	Main gear shift 6th and range gear shift "L" or "C"	Engine m ed
778	4	ERROR-21	Range gear shift High switch voltage Low	Voltage Low Traveling gear and gear switch signal is different	1. Switch malfunction 2. Short to ground line	Main gear shift 6th and range gear shift "H"	Engine m ed
2623	3	ERROR-2	Throttle sensor (SUB) voltage High	Sub voltage High Voltage > 4.9 V	1. Short to power supply line 2. Fix position of throttle sensor inappropriate 3. Throttle sensor malfunction 4. Cable disconnection	Anytime during key on	Engine id
2623	4	ERROR-2	Throttle sensor (SUB) voltage Low	Sub voltage Low Voltage < 0.2 V	1. Short to ground line 2. Fix position of throttle sensor inappropriate 3. Throttle sensor malfunction	Anytime during key on	Engine id
3452	14	ERROR-20	Rear PTO control switch signal error	Signal error Two or more signals exist at the same time.	1. Control switch malfunction	Anytime during key on	Unavaila

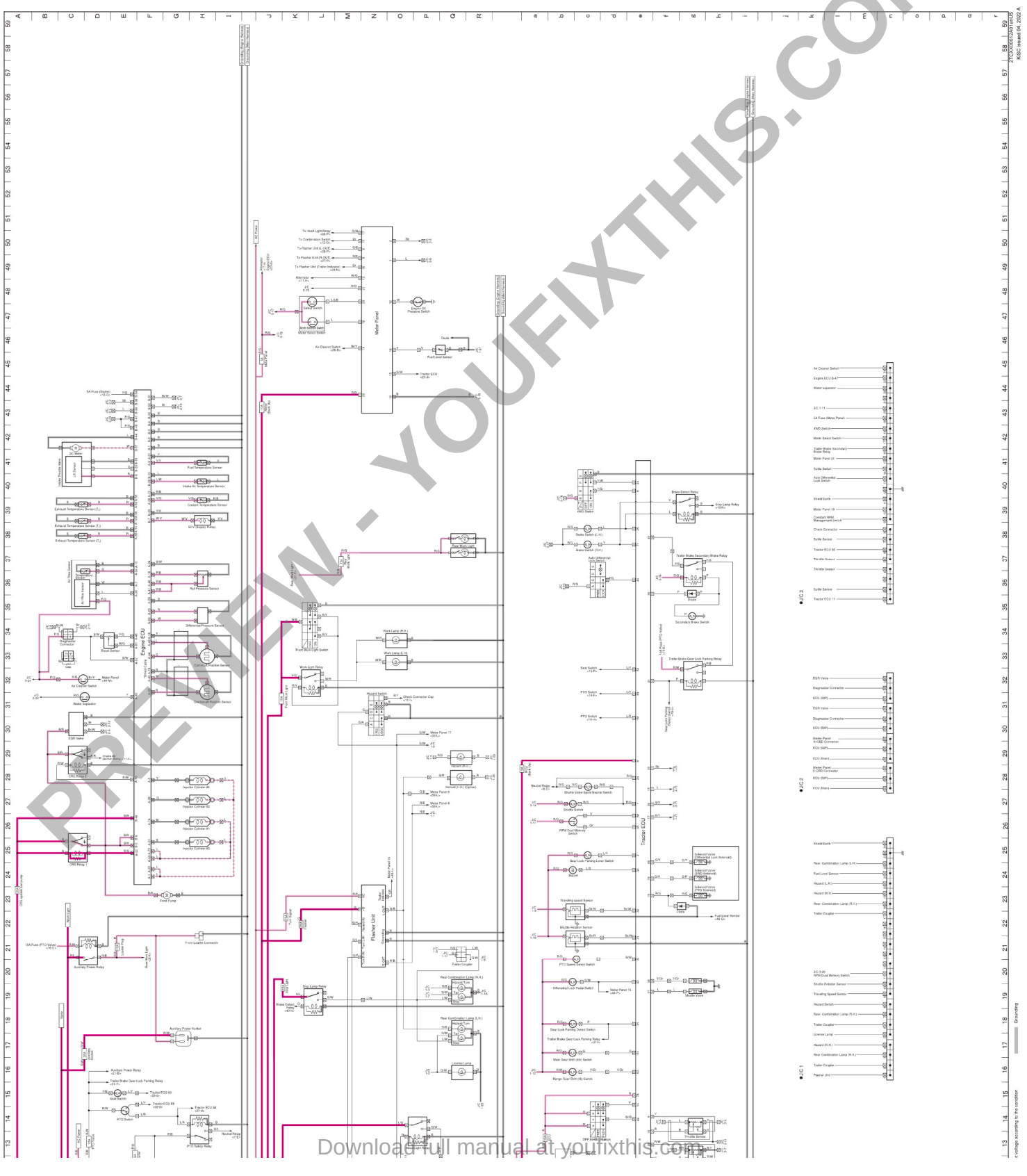
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ɪsmission model hydraulic system



(7) Oil filter
(8) Solenoid valve assembly (PTO, 4WD, differential lock)
(9) Hydraulic cylinder
(10) Relief valve (3-point lifting linkage)
(11) Hydraulic pump (Power steering, shuttle and solenoid valve)
(12) Hydraulic pump (3-point hitch)
(13) Cylinder safety valve
(14) Auxiliary control valve
(15) Lowering speed adjusting valve

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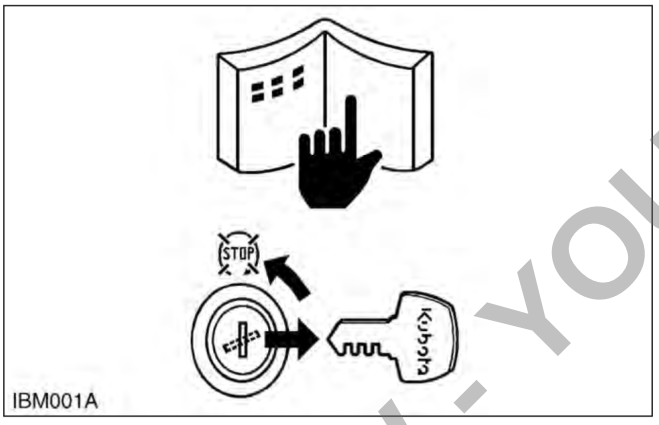


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GENERAL WORKING INSTRUCTIONS

1. General working precautions



- When servicing, observe the safety instructions in the operator's manual and workshop manual.
- Clean the machine before maintenance.
- Service the machine at a clean location.
- Park the machine on a stable and level ground then lower the attachment to check the machine safely.
- Stop the engine and remove the key when leaving the operator's seat for cleaning, maintenance, and servicing.
- Before working, remove the negative (-) terminal from the battery or turn off the battery isolator switch.
- Whenever a special tool is required, use the special tool that Kubota recommends.
- Use genuine Kubota parts to ensure safety and machine performance.



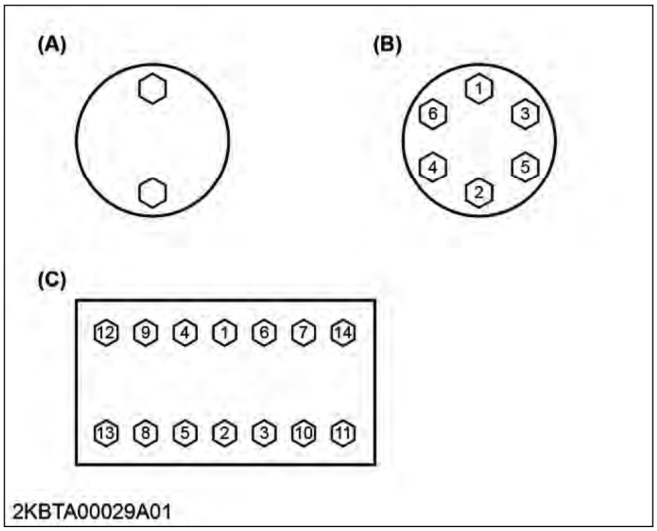
2. Tightening bolts and nuts

- Tighten the bolts and nuts to their specified torque.

■ NOTE

– Tighten the bolts and nuts alternately from top to bottom and left to right so the torque is distributed evenly.

– Gradually tighten the bolts and nuts two or three times.



(A) Alternately
(B) Diagonally
(C) Diagonally from center to outside

3. Applying thread-locking fluid

1. Clean and dry the location where a thread-locking fluid will be applied with a solvent to remove moisture, oil, and dirt.
2. Apply the thread-locking fluid to the tip of the bolt.
3. If the threads are large, apply the thread-locking fluid all around the bolt hole.

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INDEX

Symbols

16P connector
checking connector voltage..... 12-35
18T bevel gear
checking backlash.....5-119
19T bevel gear
checking backlash.....5-119
1st shaft
checking side clearance.....5-116
disassembling..... 5-81
removing..... 5-80
27T gear
removing..... 5-78
2nd shaft
disassembling..... 5-85
removing..... 5-80
2WD solenoid valve
checking.....5-124
3-point hitch hydraulic circuit diagram
outline..... 10-8
3-point hitch lowering speed linkage (cabin model)
removing.....6-11,9-19,10-48,12-47
3-point link
removing..... 6-9
3-point linkage
removing.....5-61,5-72,10-44,10-47
30T gear
removing..... 5-78
3rd shaft
disassembling..... 5-85
removing..... 5-80
4 wheel drive
structure.....8-2
4WD
oil flow.....5-19
4WD clutch
removing..... 5-89
4WD control
structure..... 11-38
4WD hydraulic clutch
function..... 5-18
4WD hydraulic pack
disassembling..... 5-89
4WD indicator
function.....11-40
4WD piston
disassembling..... 5-89
4WD propeller shaft
removing..... 5-86
4WD switch
checking connector voltage.....11-144
checking wire harness conduction..... 11-145
function.....11-41
4WD switch (cabin model)
checking.....11-145
4WD switch (ROPS model)
checking.....11-144
4WD wheels tread (front)
adjusting..... 2-30,2-32

A

A/C blower
feature.....12-4
A/C switch
checking.....12-35
accelerator lever
checking.....5-34
accelerator pedal
adjusting.....5-35
adaptor (M6) for sliding hammer.....2-67
adjustment shim
selecting.....4-76
after treatment device
overview.....4-18
air cleaner hose
removing.....4-52,4-65,9-28,12-56
air cleaner pipe
removing.....4-52,4-65,9-28,12-56
air cleaner primary element
cleaning.....3-15
replacing..... 3-28
air cleaner secondary element
replacing..... 3-28
air cleaner switch
checking.....11-173
checking connector voltage.....11-172
air conditioner
electrical circuit..... 12-7
system control.....12-5
air conditioner belt
adjusting tension.....3-18
air conditioner condenser
cleaning..... 3-9,3-10
air conditioner condenser assembly
sliding.....3-10
air conditioner duct
removing.....4-64,9-21,12-50,12-65
air conditioner hose
replacing..... 3-37
air conditioner pipe
checking.....3-26
air conditioner unit
disassembling..... 12-67
feature.....12-3
air conditioning system
structure.....12-1

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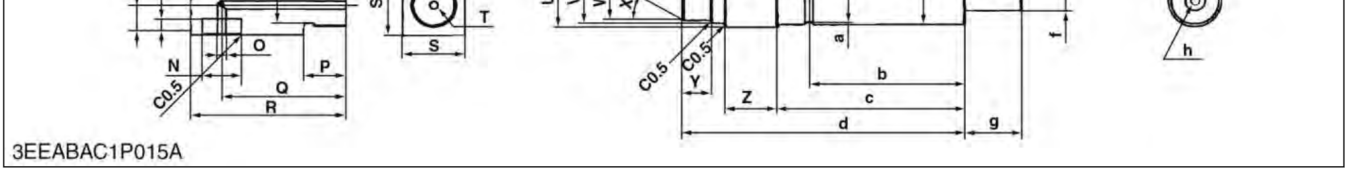
RECORD OF REVISIONS

For pdf, use search function [Search word] to find all the revised locations.

Last digit of the code No.	Month of revision	Main revised point and corrective measure [Search word]	Reference page
1	2020 Sep.	Addition of ROPS model content.	–
2	2022 Apr.	Corrected a typographical error in the electric circuit for Cabin.	–

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(1) Material SS400
(2) Material S43C-D
(3) Pin 05012-00408
(4) O-ring 04811-00150
(5) Arc welding

A	5 mm (0.1969 in.)
B	115.9 to 116.1 mm (4.5630 to 4.5709 in.)
C	105 mm (4.1339 in.)
D	4 mm dia., 4 mm depth (0.1575 in dia., 0.1575 in. depth)
E	6 mm (0.2362 in.)
F	5.3 mm (0.2087 in.)
G	1.9 mm (0.0748 in.)
H	3.5 mm (0.1378 in.)
I	11.6 to 12.1 mm (0.4567 to 0.4764 in.)
J	6 to 6.1 mm (0.2362 to 0.2402 in.)
K	13 mm dia. (0.5118 in. dia.)
L	11 mm (0.4331 in.)
M	5/8-18UNF-2B
N	14.0 to 14.011 mm dia. (0.5512 to 0.5516 in. dia.)
O	3 mm dia. (0.1181 in. dia.)
P	15 mm (0.5906 in.)
Q	44 mm (1.7323 in.)

(Continued)

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R	55 mm (2.1654 in.)
S	22 mm (0.8661 in.)
T	3 mm dia., 44.5 to 45 mm depth (0.1181 in. dia., 1.7520 to 1.7717 in. depth)
U	19 mm dia. (0.7480 in. dia.)
V	16 mm dia. (0.6299 in. dia.)
W	14 mm dia. (0.5512 in. dia.)
X	0.524 rad. (30°)
Y	10 mm (0.3937 in.)
Z	19 mm (0.7480 in.)
a	14.94 to 15 mm dia. (0.5882 to 0.5906 in. dia.)
b	55 mm (2.1654 in.)
c	66 mm (2.5984 in.)
d	100 to 100.1 mm (3.9370 to 3.9409 in.)
e	16.89 to 17 mm dia. (0.6650 to 0.6693 in. dia.)
f	7.1 to 7.2 mm dia. (0.2795 to 0.2835 in. dia.)
g	20.3 to 20.5 mm (0.7992 to 0.8071 in.)

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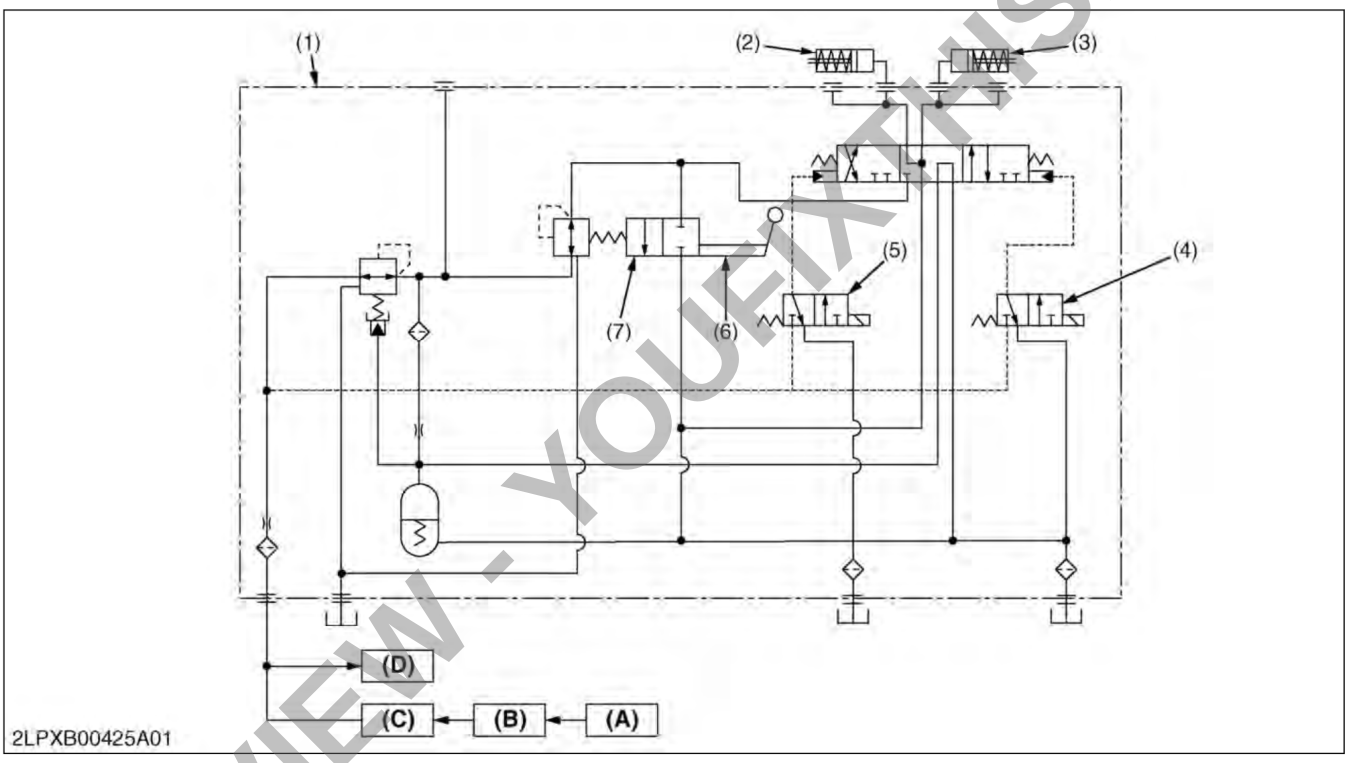
PM warning level 0 to 5 as shown below is set according to the amount of accumulated PM to prompt the operator to perform the required procedure in each level.

- Level 0: Normal operation. Regeneration is not required.
- Level 1: Auto Regeneration is possible in the Auto Regeneration Mode.
- Level 2: Auto Regeneration is possible in the Auto Regeneration Mode. Parked Regeneration is possible in both of the Auto Regeneration Mode and Inhibit Mode.
- Level 3: Auto Regeneration is not possible in above level 3. Parked Regeneration is required as soon as possible.
- Level 4: Only by using diagmaster, Parked Regeneration is possible. Parked Regeneration is required as soon as possible.
- Level 5: Cleaning or replacement is required. Regeneration is not possible.

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2.1.2 Oil flow of hydraulic shuttle



(1) Shuttle valve
(2) Reverse clutch
(3) Forward clutch
(4) Reverse clutch solenoid valve
(5) Forward clutch solenoid valve
(6) Clutch pedal
(7) Spool
(A) Pump
(B) Power steering controller
(C) Oil cooler
(D) PTO clutch and other clutches

When the shuttle lever is shifted to the **[forward]** or **[reverse]**, the oil flows to the forward clutch (3) or reverse clutch (2).
When clutch pedal (6) is depressed, feeding oil returns to the tank through the spool (7), and the clutch is in a "Disengaged" position.

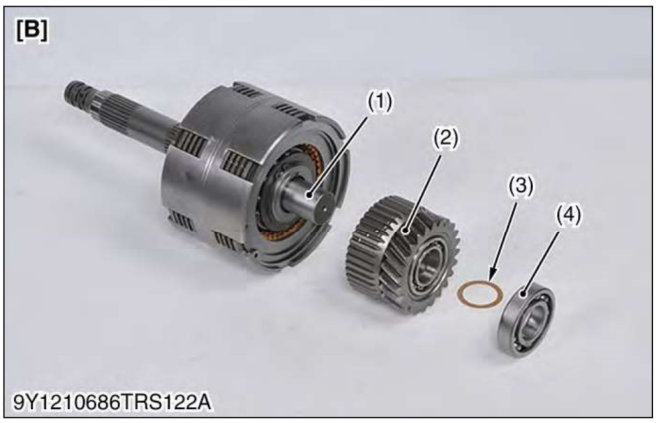
2.1.3 Power train of shuttle shift section

The shuttle shift section allows the operators to change forward and reverse with a shuttle lever. It is using hydraulic clutch shifting.
When the shuttle lever is moved to the F or R position, clutch is engaged to the front or rear by the hydraulic.

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Gear (5)	28T gear

F36/R36 speed transmission model

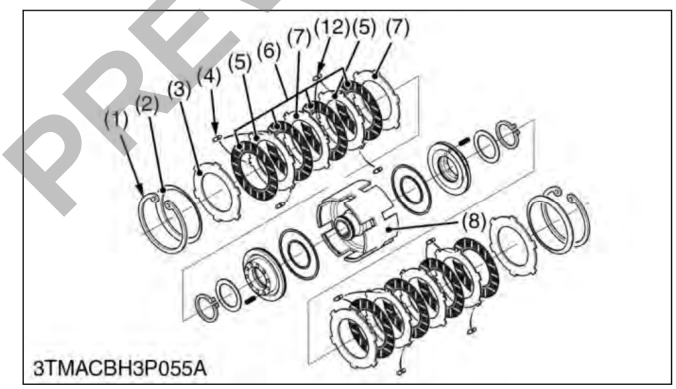
Gear (2)	24T gear
Gear (5)	27T gear

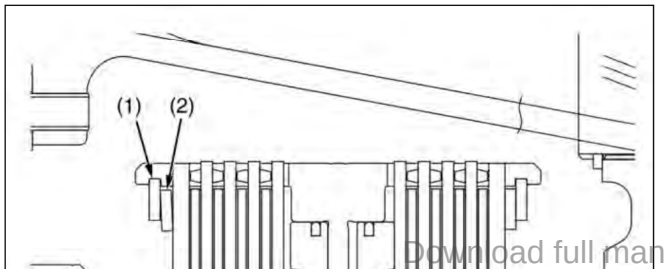
5.7.2.4 Disassembling hydraulic shuttle clutch pack

1. Remove the internal circlip (1).

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2. Remove the belleville washer (2), pressure plate (3), steel plates (5), (7) and clutch discs (6).





- Two steel plates (5) match the position of rubber (4) from the piston side, and two remaining steel plates (7) are not matched.
- Do not confuse the pressure plate (3) and steel plate (7). The pressure plate (3) is thicker than the steel plate (7).
- Be sure to assemble the belleville washer (cupped spring washer) (2) direction as shown in the figure.
- When installing the internal circlip (1) to the clutch body (8), align its split portion to the notched portion of clutch body as shown in the photo.
- When assembling the shuttle shaft (10) with gear (11) for reverse side, temporarily align the spline and clutch disc teeth using the gear (9).
  - Insert the steel piece (a) between belleville washer (cupped spring washer) (2) and pressure plate (3) to prevent the clutch discs (6) from turning during assembling.
  - Draw out the gear (9) after inserting the steel piece (a). And then tap in the shuttle shaft (10) with gear (11).
  - Do the same procedure for forward side.
- Make sure the piston moves smoothly when 0.50 to

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LSD slip torque	Service specification	54 to 67 N·m 5.5 to 6.9 kgf·m 40 to 49 lbf·ft

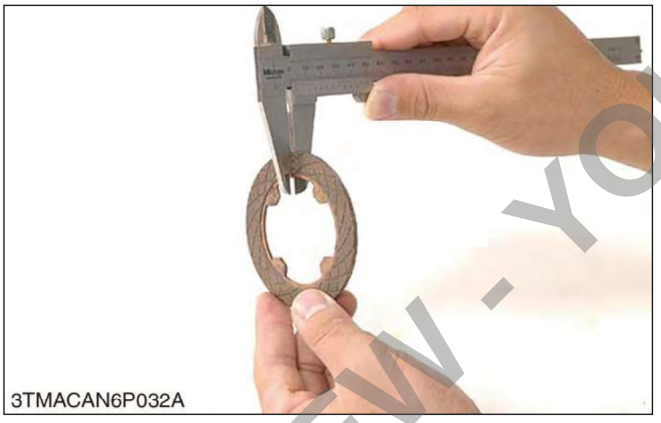
(Reference)

- Jig in the photo: Spline from yoke shafts welded with box wrench.

Thickness of adjusting shim	0.1 mm 0.004 in.	Code No. 35533-43010
	0.2 mm 0.008 in.	Code No. 35533-43020
	0.4 mm 0.016 in.	Code No. 35533-43030
	0.8 mm 0.032 in.	Code No. 35533-43040
	1.0 mm 0.039 in.	Code No. 35533-43050
	1.2 mm 0.047 in.	Code No. 35533-43060

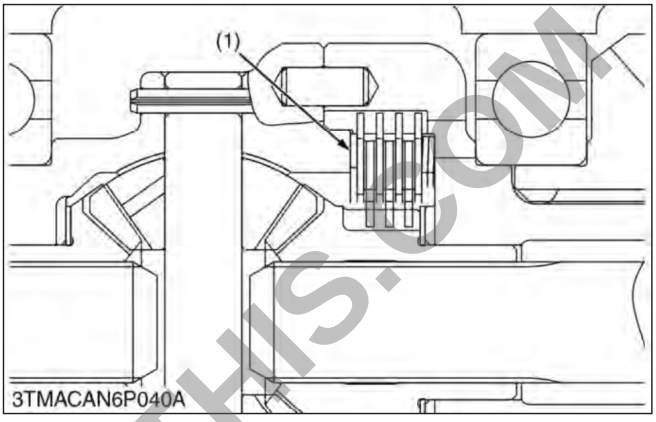
Thickness of steel plate	Service specification	1.32 to 1.48 mm 0.0520 to 0.0582 in.
Thickness of LSD disc		2.55 to 2.65 mm 0.101 to 0.104 in.

Change of slip torque per 0.1 mm (0.004 in.) shim	Approximately 5 to 6 N·m 0.5 to 0.7 kgf·m 4 to 5 lbf·ft





3. If the LSD slip torque is not within the service specification, adjust with LSD shim (1).



(1) Shim

RELATED PAGE
2.15 LSD adaptor on page 2-68

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6.1.8 Checking front bracket and rear

Bearing retainer	Service specifi-	59.97 to 60.00 mm

Draft feedback length		10.7 in.

5.3.6 Removing draft spool lever and position spool lever

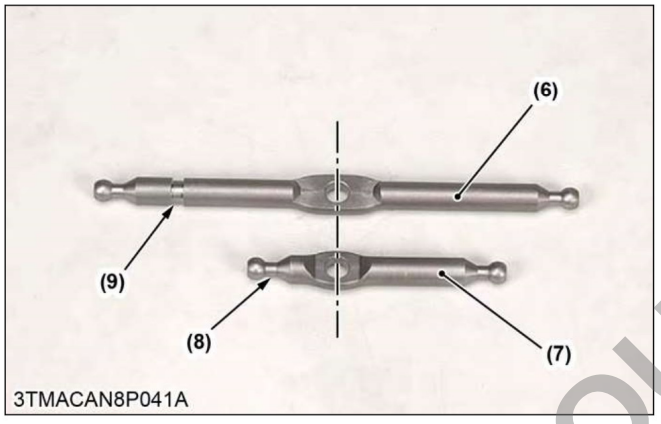
■ NOTE

- **Do not disassemble the spool joint 1 (11) from the spool (10) unless necessary.**

(4) Draft shaft
(5) Position shaft

(When reassembling)

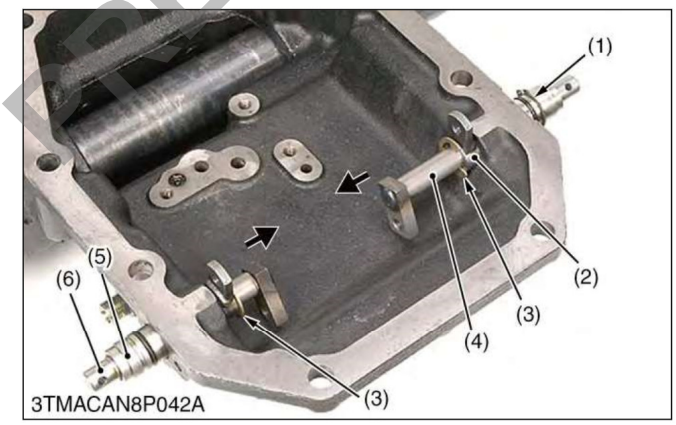
- Fix the groove (9) side on the draft spool lever (6) and the shorter side (8) on the position spool lever (7) facing to the hydraulic operating lever side.
- Be sure to fix the O-rings to the control valve and apply grease to them.



(6) Draft spool lever
(7) Position spool lever
(8) Shorter side
(9) Groove

5.3.7 Removing position and draft control shaft and position and draft feedback shaft

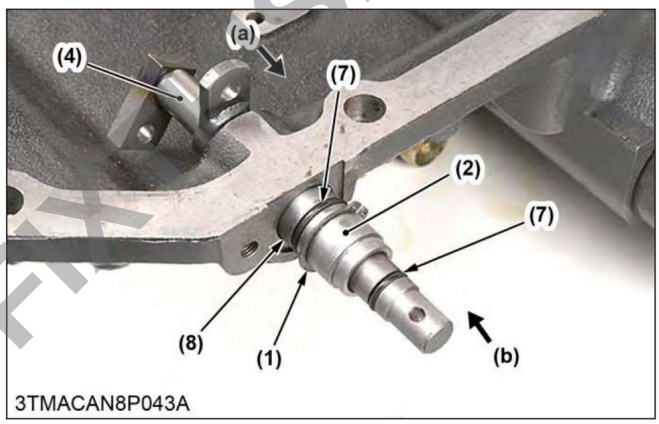
1. Remove the position and draft feedback rod.
2. Remove the external circlip (1). Draw out the position and draft control shaft (4) and (2).
3. Remove the E-shaped stopper (3).
4. Remove the position feedback shaft (6) from draft feedback shaft (5) and remove the position control shaft (4) from draft control shaft (2).



(1) External circlip
(2) Draft control shaft
(3) E-shaped stopper
(4) Position control shaft
(5) Draft feedback shaft
(6) Position feedback shaft

(When reassembling)

1. Remove the O-ring (7) from position control shaft



(1) External circlip
(2) Draft control shaft
(4) Position control shaft
(7) O-ring
(8) Chamfer
(a) To fix O-rings
(b) To assemble shafts

5.4 Control valve

5.4.1 Removing control valve

■ NOTE

- **Do not disassemble the spool joint (5) from the spool (7) unless necessary.**
  If disassembled due to unavoidable reasons, record the installation length L1 between the spool joint (5) and spring retainer. (as shown figure).
  When reassembling, be sure to make a former length.
- **Do not loosen the adjusting bolt (8) unless necessary.**

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ERROR-3	Acceleration sensor main/sub phase shifting trouble	Sum of sensor voltage < 3.85 V or 6.14 ≦ sum of sensor voltage	
ERROR-4	Shuttle Lever Sensor (main) trouble	Sensor voltage ≦ 0.2 V or 4.9 V ≦ sensor voltage	Cannot Drive
ERROR-5	Shuttle Lever Sensor (sub) trouble	Sensor voltage ≦ 0.2 V or 4.9 V ≦ sensor voltage	
ERROR-6	Shuttle sensor main/sub phase shifting trouble	Sum of sensor voltage < 3.85 V or 6.14 ≦ sum of sensor voltage	
ERROR-7	Shuttle sensor signal trouble	Although shuttle lever sensor is F/R position, shuttle lever Neutral switch is ON.	
ERROR-8	Gear lock signal trouble	Open circuit or short circuit	—
ERROR-11	PTO relay trouble	Open circuit or short circuit	Unavailable PTO
ERROR-12	4-wheel-drive solenoid trouble	Open circuit or short circuit	Unavailable 4WD
ERROR-14	Shuttle forward solenoid trouble	Open circuit or short circuit	Cannot Drive
ERROR-15	Shuttle reverse solenoid trouble	Open circuit or short circuit	
ERROR-21	Range gear shift (Hi) switch trouble	Switch status and estimate shift is different	Engine maximum speed is limited.
ERROR-22	Main gear shift (6th) switch trouble	Switch status and estimate shift is different	
ERROR-23	Shuttle rotating sensor trouble	Pulse is not detected when driving at H6 shift.	
ERROR-24	Machine speed sensor trouble	Pulse is not detected when driving at H6 shift.	
ERROR-ENG *(ERROR-41)	Engine communication trouble	Communication breakdown more than 5 seconds	Engine loss of control

(Continued)

Error code	Trouble content	Detail	System action
ERROR-ECU ***(ERROR-43)	ECU communication trouble or Meter communication trouble	Communication breakdown more than 5 seconds	Undisplayed meter panel
ERROR-60	Analog reference supply voltage +5 V trouble	Short circuit of sensor voltage	Engine Idling and cannot drive
ERROR-63	Acceleration and engine adjustment trouble		Engine Idling
ERROR-NET	Communication trouble	Disconnection of CAN harness or short circuit	Loss of various control

* When you check the error history using CHK-1, error code is displayed as (ERROR-41).

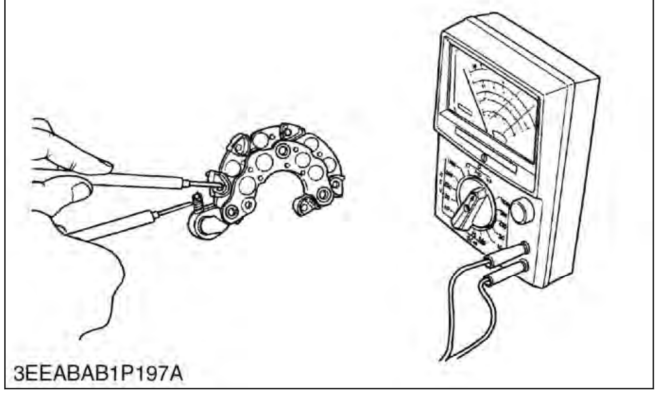
*** When you check the error history using CHK-1, error code is displayed as (ERROR-43).

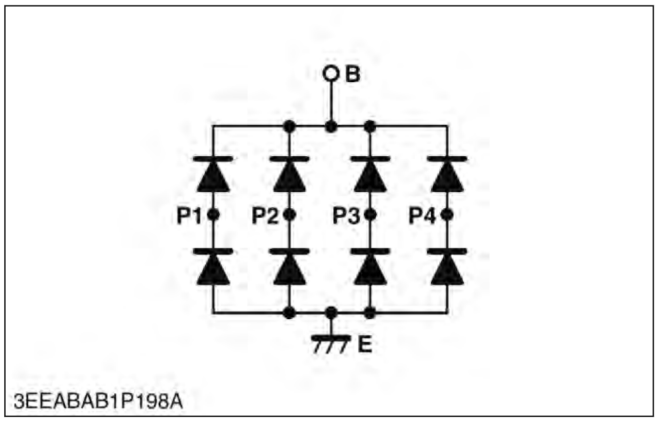
5.1.3.2 Clearing error history CHK-2

Select the item number "CHK-2".



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3EEABAB1P197A



3EEABAB1P198A

1. Check the continuity across each diode of rectifier with an ohmmeter.
2. If the diode in the rectifier conducts in one direction and does not conduct in the reverse direction, the rectifier is normal.

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