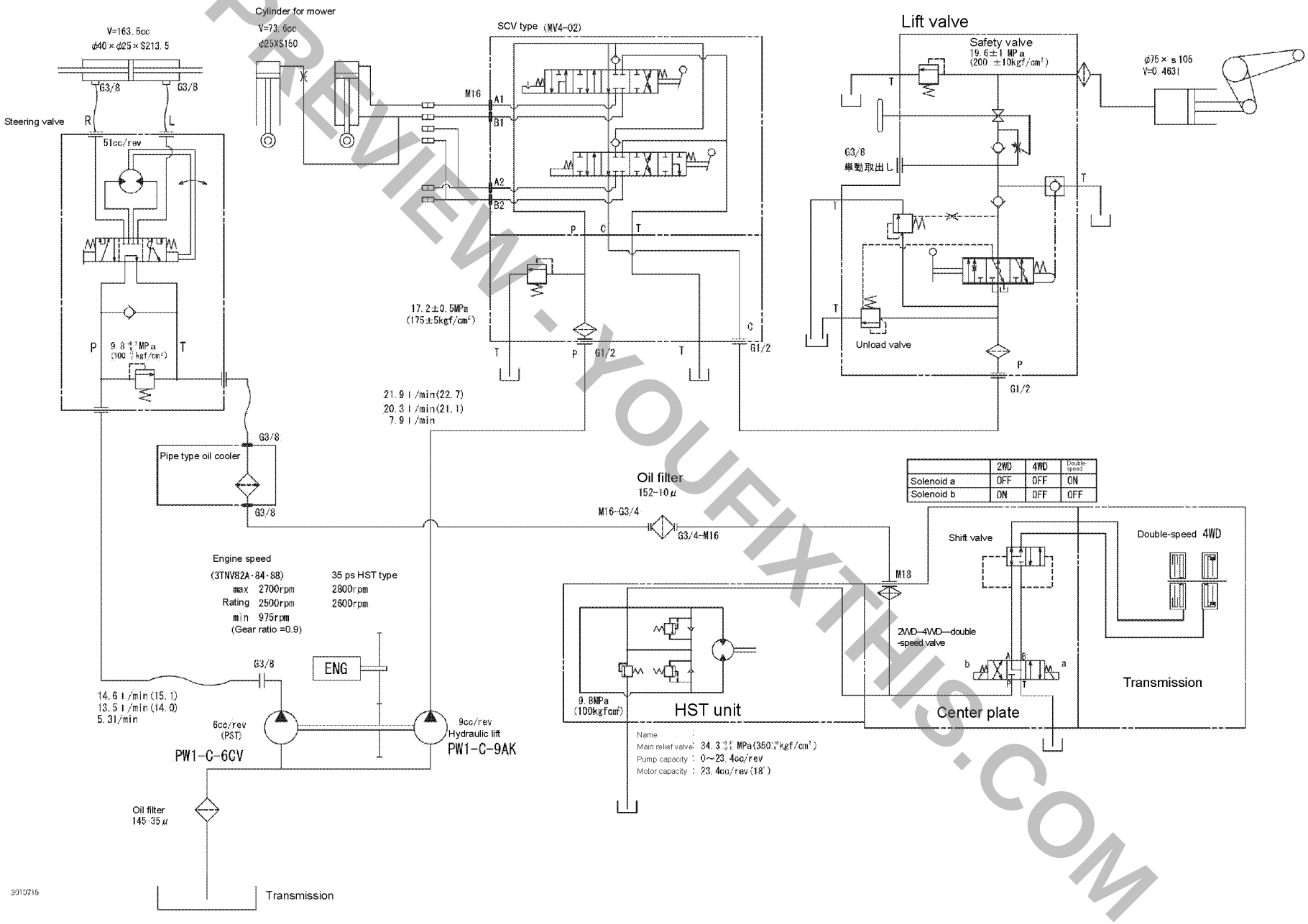
1. Hydraulic Circuit Diagram



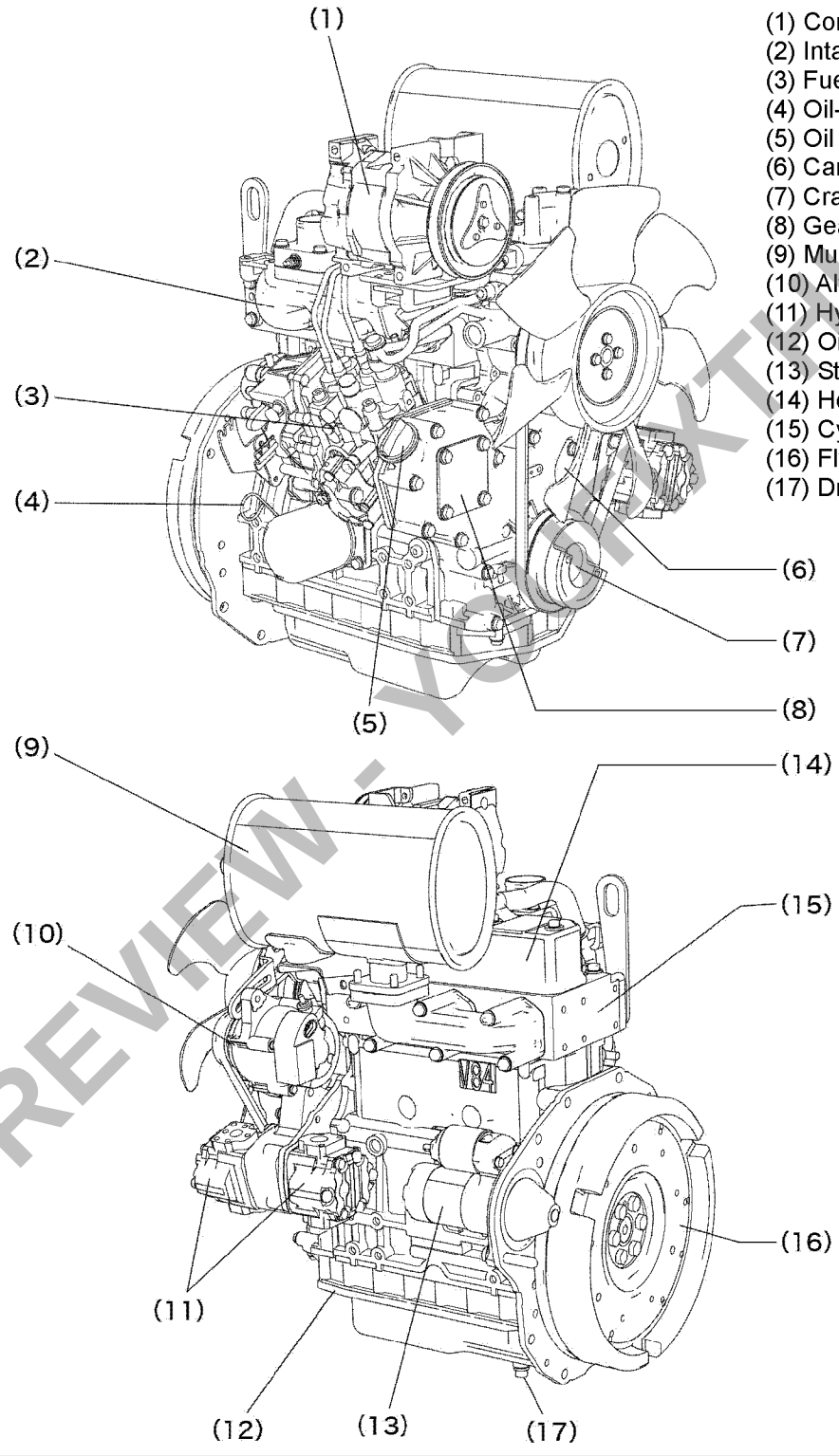
PREVIEW-YOUFIXTHIS.COM

Download full manual at youfixthis.com

1. Structure and Functions

1-1. Overview

This tractor uses a powerful, clean engine that has been designed to minimize harmful substances such as particulate matter (PM), dry soot, and nitrogen oxides (NOX) contained in exhaust gas; achieve more homogeneous mixing of fuel with air for higher output; and reduce the wasteful volume of the combustion chamber toward the ultimately complete combustion; thereby complying with ecological issues about which people have become more concerned in recent years.



(1) Compressor (cabin type)
(2) Intake manifold
(3) Fuel injection pump
(4) Oil-level stick
(5) Oil inlet
(6) Cam shaft
(7) Crank shaft
(8) Gear lid for fuel injection pump
(9) Muffler
(10) Alternator
(11) Hydraulic pump
(12) Oil pan
(13) Starter
(14) Hood
(15) Cylinder head
(16) Flywheel
(17) Drain plug

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

2-3. General tightening torques

The bolts for which torques are specified are identified in the corresponding paragraphs.

To tighten any bolt other than those specified, follow the table below.
For the purpose of factory line management, all the bolts may have been unified into 7T bolts. In this recent trend, when any aluminum part is concerned or when any bolt with rubber or any rubber packing is used, follow the instructions for 4T bolts (*1).

General tightening torques

Item	Screw diameter	Tightening torque N·m(kgf·m)	Remarks
Hex bolt and nut	6mm	8 to 12 (0.8 to 1.2)	1) When hex bolts and nuts are tightened to any aluminum part, use 80% of the values indicated at left. 2) For 4T bolts and locknuts, use 60% of the values shown at left (*1).
	8mm	23 to 29 (2.3 to 3.0)	
	10mm	44 to 59 (4.5 to 6.0)	
	12mm	78 to 98 (8.01 to 0.0)	
	14mm	118 to 147 (12.0 to 15.0)	
	16mm	167 to 206 (17.0 to 21.0)	
	18mm	235 to 284 (24.0 to 29.0)	
	20mm	324 to 402 (33.0 to 41.0)	
PT plug	1/8	9.8 (1.0)	
	1/4	19.6 (2.0)	
	3/8	29.4 (3.0)	
	1/2	58.8 (6.0)	
Pipe joint bolt	8mm	12 to 17 (1.2 to 1.7)	
	12mm	25 to 34 (2.5 to 3.5)	
	14mm	39 to 49 (4.0 to 5.0)	
	16mm	49 to 59 (5.0 to 6.0)	
	18mm	69 to 78 (7.0 to 8.0)	
	20mm	88 to 98 (9.0 to 10.0)	
	22mm	113 to 123 (11.5 to 12.5)	

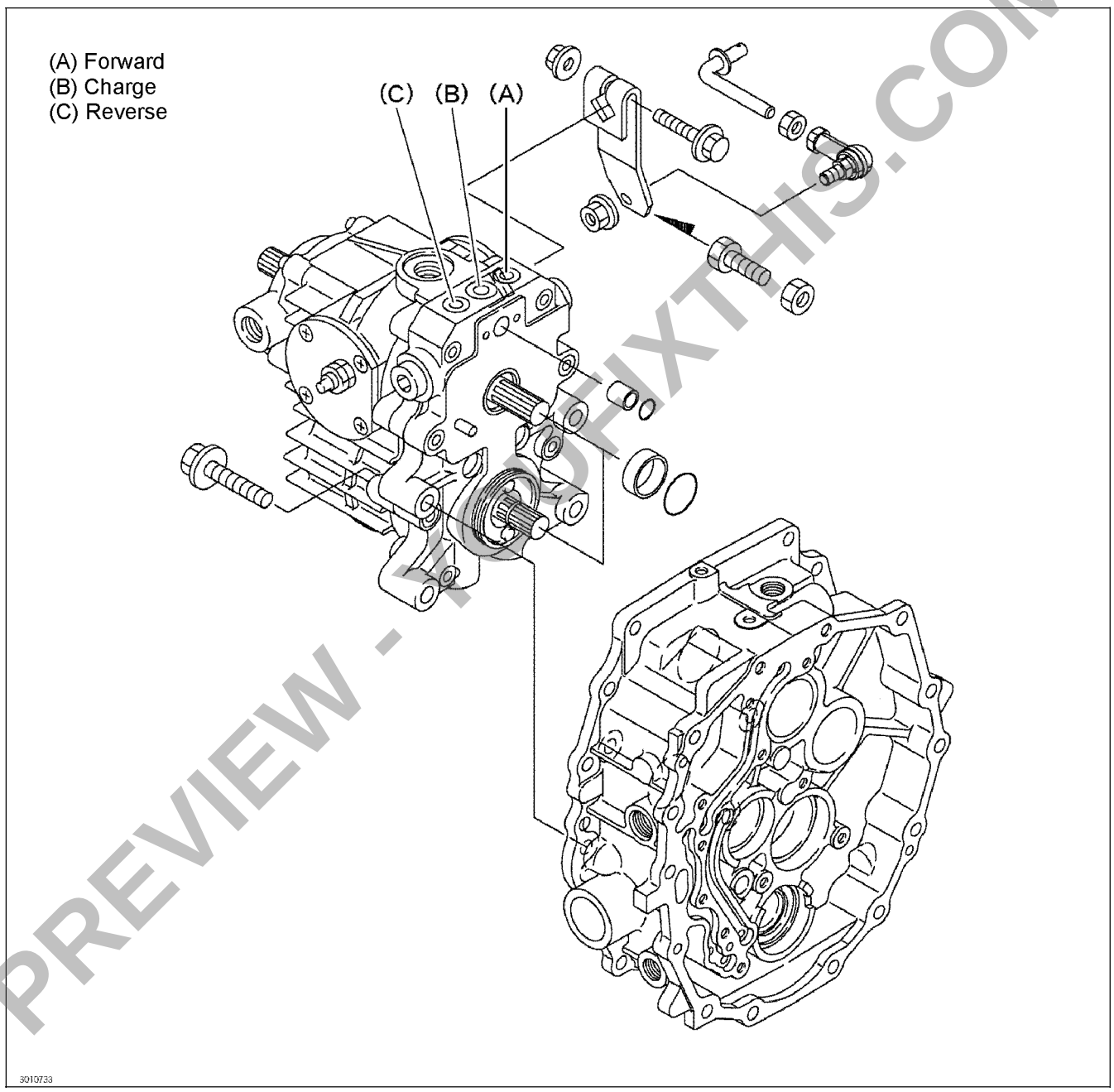
PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

(4) Checking the operating pressure

[How to measure]
Install a plug used to measure hydraulic pressure into the measurement ports (A) to (C) shown in the following illustration.

Relief pressure	Forward and reverse	$34.3^{+1.0}_{-0.5}$ MPa (350^{+10}_{-5} kgf/cm^2)
	Charge	9.8MPa (100kgf/cm^2)



PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

1. Specifications

ITEM		EF227H	EF230H	EF233H	EF235H
ENGINE Model		3TNV82A	3TNV84	3TNV88	3TNV88
Type		4-cycle, water-cooled diesel			
Output	HP/rpm	26.5 /2500	29.5 /2500	32.5/2500	34.5 /2600
ECE R24	KW	17.3	19.6	21.6	22.4
DISPLACEMENT	cc	1330	1496	1642	1642
LENGTH	mm	2920			
WIDTH (TIRE)	mm	1315 (315/80D16), 1240 (9.5-22), 1245 (9.5-20)			
HEIGHT (TIRE) CAB	mm	2000 (315/80D16), 2035 (9.5-22), 2025 (9.5-20)			
HEIGHT (TIRE) ROPS	mm	2390 (315/80D16), 2435 (9.5-22), 2420 (9.5-20)			
WHEEL BASE	mm	1600			
TREAD (TIRE) FRONT	mm	995 (24X8.50-12), 1120 (6-14)			
TREAD (TIRE) REAR	mm	1000 (315/80D16), 1005 (9.5-22), 1010 (9.5-20)			
WEIGHT CAB (ROPS)	kg	1090 (965)	1110 (985)	1110 (985)	1110 (985)
TRANSMISSION (RANGE)		HST (3)			
TURF TIRE FRONT		24X8.50-12			
TURF TIRE REAR		315/80D-16			
AG TIRE FRONT		6-14			
AG TIRE REAR		9.5-22			
FUEL TANK CAPACITY	liters	28			
HYDRAULIC LIFT	kg	1150			
REAR PTO	rpm	540			560
MID PTO	rpm	2000			2100

TRAVELING SPEED & TIRE SIZE

TIRE SIZE / RANGE			315/80D16	9.5-22	9.5-20
1	Forward	Km/h	0-6.3	0-7.0	0-6.5
2		Km/h	0-11.0	0-13.0	0-12.0
3		Km/h	0-27.0	0-30.0	0-28.0
1	Reverse	Km/h	0-4.1	0-4.6	0-4.2
2		Km/h	0-7.2	0-8.5	0-7.8
3		Km/h	**0-17.6**	**0-20**	**0-18.2**

TRACTOR MASS AND TIRE SPECIFICATIONS

TIRE SIZE (Ply number)		FRONT AXLE		REAR AXLE	
		Permissible load capacity on tires	Technically permissible mass on each axle	Permissible load capacity on tires	Technically permissible mass on each axle
F: 24x8.50-12(6), R: 315/80d-16(6)	kg	1080	980	1800	1675
F: 6-14(4), R: 9.5-22(6)	kg	610	980	1700	1675
F: 6-14(4), R: 9.5-20(6)	kg	610	980	1680	1675

IMPORTANT

Set up the implement so that the front wheel load and the rear wheel load of the tractor are not more than whichever is smaller, either the permissible load capacity on the tires or the technically permissible mass on each axle.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

2-5. Oil, grease and anti-freezing fluid

OIL, GREASE	Type
Fuel oil	Diesel fuels; grade 1-D or 2-D defined by ASTM Designation D975
Engine oil	No SAE Class CC or higher grade 10W-30
Grease	Multi-purpose type
Anti-freezing liquid	Ethylene-glycol antifreeze compound (follow its instructions)
Transmission oil, Hydraulic system oil	Yanmar TF-500A transmission fluid or equivalent
Gear oil for front axle	Gear oil SAE #90

2-6. Capacity of oils and water

		EF227H (Cabin)	EF230H, 233H, 235H (Cabin)
Fuel oil		28 Lit	28 Lit
Cooling water	Radiator	3.5 (4.0) Lit	3.7 (4.2) Lit
	Sub-tank	0.4 Lit	0.4 Lit
Engine oil		3.3 Lit	3.3 Lit
Transmission oil		25 Lit	25 Lit
Front axle oil		5.7 Lit	5.7 Lit
Power steering oil		Transmission oil	

Equivalent oil to transmission fluid TF500A

Supplier	Brand name
Mobil	Mobil Fluid 425
Castrol	Agricastrol MP
ESSO	Torque Fluid 56
Shell	Shell Tellus Oil 32 or 37

* Different brands of oil must not be mixed with each other.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

2-4. Periodical check items

CHECK ITEMS	50 h	100h	150h	200h	250h	300h	350h	400h	450h	500h	550h	600h
Engine lubrication oil	Replace	Replace		Replace		Replace		Replace		Replace		Replace
Transmission oil	Replace	O	O	O	O	Replace	O	O	O	O	O	Replace
Front axle oil	Replace	O	O	O	O	Replace	O	O	O	O	O	Replace
Engine oil element	Replace					Replace						Replace
HST oil element (HST model only)	Replace					Replace						Replace
Radiator interior	Clean the interior of radiator when replacing cooling water											
Fuel strainer, element			Clean	Clean	Clean	Replace	Clean	Clean	Clean	Clean	Clean	Replace
Cooling water (Replace)	Check before every work (Replacing every year)											
Transmission oil strainer	Clean					Clean						Clean
Air cleaner element	O	O	O	O	O	O	O	Replace	O	O	O	O
Clean dust net	O	O	O	O	O	O	O	O	O	O	O	O
Clean cooling fan, radiator	O	O	O	O	O	O	O	O	O	O	O	O
Battery liquid level	Check before every work											
Battery liquid gravity		O		O		O		O		O		O
Fuel piping, connections	O	O	O	O	O	O	O	O	O	O	O	O
Rubber hoses (Power steering)	O	O	O	O	O	O	O	O	O	O	O	O
Radiator hoses	Replace hoses every two years											
Hydraulic rubber hoses	Replace hoses every two years											
Fuel pipe, electric wires	Replace pipes and wires every two years											
Electric wiring, connections	O	O	O	O	O	O	O	O	O	O	O	O
Grease-up	O	O	O	O	O	O	O	O	O	O	O	O
Fastening of steering wheel fix nut		O		O		O		O		O		O
Important nuts and bolts	O	O		O		O		O		O		O
Cooling fan belt	O	O		O		O		O		O		O
Engine breather pipe	O	O	O	O	O	O	O	O	O	O	O	O
Engine crank case												O
Clearance of exhaust valve												O
Fuel injection valve												O
Generator, start motor	O	O				O				O		
Hydraulic system	O	O				O				O		

Check at the first 50 operating hours or after the first year operation.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

1. Periodical Check Items

1-1. Checking and changing oils

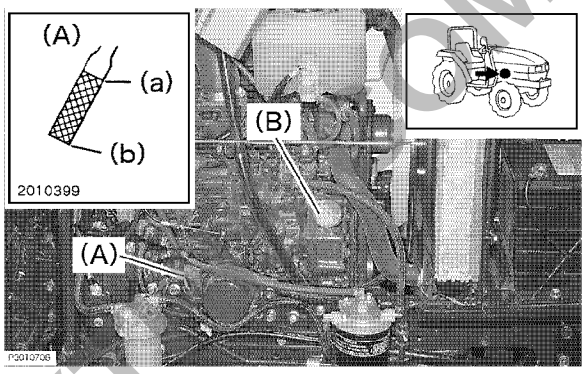
DANGER

- **Never add oil when the engine is operating or hot. Failure to observe this instruction could cause a fire.**

(1) Engine oil

<Check>

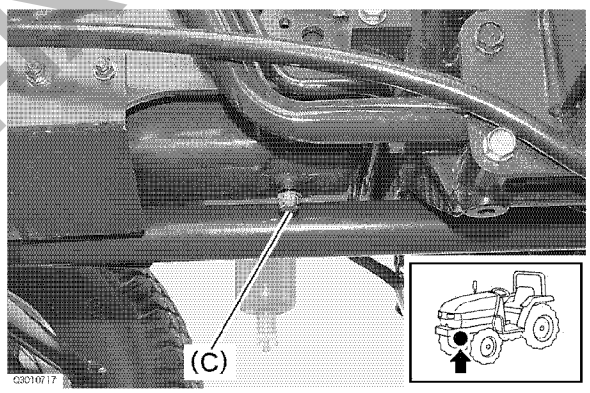
Check to see whether the oil level is between the upper and lower limits of the oil gauge. If the oil level is too low, add oil through the oil inlet to the specified level of the oil gauge.



(A) Oil gauge (a) Upper limit
(B) Oil inlet (b) Lower limit
(C) Drain plug

NOTE

- **When checking the oil level, park the tractor in a level place.**
- **The oil level should be checked before the engine is started or when the engine is cool.**



<Change>

Time of change		After 50 and 100 hours; subsequently every 100 hours
Oil	Type	SAE, CC grade or higher, 10W-30
	Quantity	3.3 liters

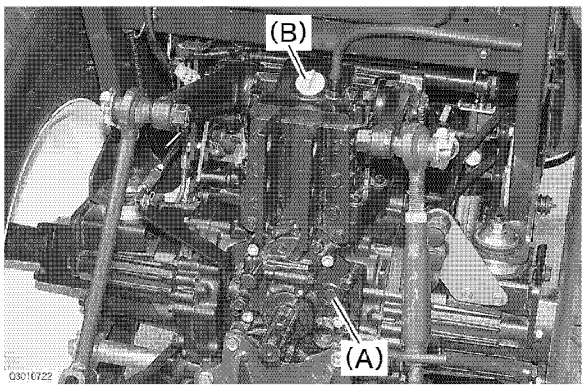
[Tips]

- **When draining the engine oil, it is easy if the oil is slightly warm.**

(2) Transmission oil

<Check>

Check the oil level through the oil check window located near the PTO shaft. If the oil level is too low, add oil through the oil inlet to the specified level of the oil check window.



(A) Oil check window
(B) Oil inlet

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

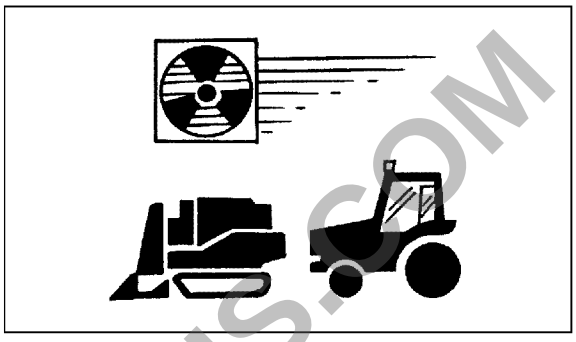
1. Safety Work

1-1. Precautions for safe services

(1) Maintenance shop (location)

DANGER

Your workshop shall be ventilated sufficiently.



If your work involves emitting exhaust gas from the engine, welding any painted part, applying sandpaper to any painted surface, or similar operations, choose a well ventilated location as your workshop.

[If not observed]
The human body will be exposed to serious danger from the inhalation of poisonous gas or dust.

CAUTION

Your workshop shall have a large, flat area.

The floor of the maintenance shop (location) to check and service your tractor shall be large and flat without holes and the like.

[If not observed]
The tractor may overturn or a similar accident may occur.

CAUTION

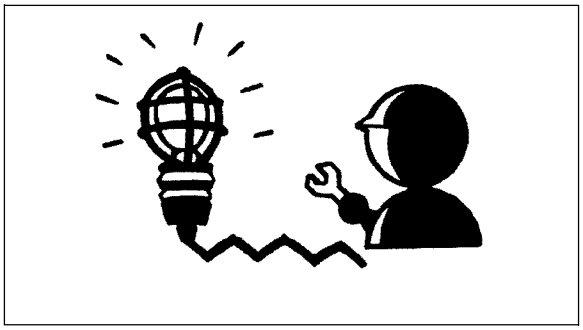
Your workshop shall be cleaned and kept in order.

Do not leave any dust, dirt, oil, parts, or the like on the floor.

[If not observed]
An accident may occur.

CAUTION

Your workshop shall be given bright, safe illumination.



Your workshop shall be illuminated sufficiently and safely. If you work inside or under the tractor, use a portable safety lamp with its bulb covered with a wire cage.

[If not observed]

The bulb may be broken accidentally, causing any leaked oil to catch fire.

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

Contents

I Safety Items and Services ---------- 4

1. Safety Work ----------5
   1-1. Precautions for safe services ----------5
   1-2. Location of safety signs ----------9
2. General Precautions for Services --------11
   2-1. Identification and hour meter of tractor -------11
   2-2. General precautions for services ----------11
   2-3. General tightening torques ----------14
   2-4. Periodical check items ----------15
   2-5. Oil, grease and anti-freezing fluid ----------16
   2-6. Capacity of oils and water ----------16

II Specifications ---------- 18

1. Specifications ----------19

III General ---------- 20

1. Periodical Check Items ----------21
   1-1. Checking and changing oils ----------21
   1-2. Replacing each element ----------23
   1-3. Checking and changing cooling water -------25
   1-4. Checking and filling fuel ----------26
   1-5. Air bleed from fuel ----------26
   1-6. Cleaning and replacing the radiator screen and the air cleaner element ---------27
   1-7. Checking and replacing the battery ----------27
   1-8. Checking pipes and hoses ----------29
   1-9. Checking electrical wiring ----------29
   1-10. Locations of applying grease ----------30
   1-11. Checking and adjusting the brakes ----------31
   1-12. Checking and adjusting the steering wheel -----32
   1-13. Checking and adjusting the fan belt ---------32
   1-14. Checking and adjusting toe-in ----------33
   1-15. Checking and replacing the fuses and the slow blow fuses ----------34
   1-16. Checking the tires ----------35
2. Exterior ----------36
   2-1. Opening/closing the hood ----------36
   2-2. Opening/closing the engine side cover ------36
3. Separating the Cabin or the Floor --------37
4. Front Axle Mechanism ----------41
5. Rear Axle Mechanism ----------42
6. Hydraulic Cylinder Case ----------43

IV Engine ---------- 46

1. Structure and Functions ----------47
   1-1. Overview ----------47
   1-2. Fuel system ----------48
   1-3. Combustion system ----------52
   1-4. Lubricating oil system ----------55
   1-5. Cooling water system ----------56
   1-6. Maintenance standards ----------58
2. Removing the Fuel Injection Pump ----65

V Transmission ---------- 68

1. Transmission Mechanism ----------69
2. HST ----------70
   2-1. Outline ----------70
   2-2. Outline of operation ----------70
   2-3. Maintenance standards ----------74
   2-4. Troubleshooting ----------76
3. Structure and Functions ----------78
   3-1. Gearshift and power transmission route ---78
   3-2. Separation and assembly of the center plate ----------79
   3-3. Disassembling the inside of the transmission ----------81
4. Checks and Adjustments ----------84
   4-1. Adjusting the change pedal ----------84
   4-2. Adjusting the PTO levers ----------86
   4-3. Sub-shift lever ----------87
   4-4. Adjusting the hand brake ----------87
5. On-the-go High Grip Turn ----------88
   5-1. Outline ----------88
   5-2. Electrical control parts ----------91
   5-3. Checking electric parts ----------94
   5-4. Hydraulic control parts ----------96
6. Disassembly and Reassembly ------97
   6-1. Maintenance standards ----------97
   6-2. Development view ----------98
   6-3. Measuring the double-speed clutch pressure -------100

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

YANMAR

YANMAR

DIESEL TRACTOR

EF227H/230H/233H/235H

TECHNICAL MANUAL

PREVIEW - YOUFIXTHIS.COM



Read this manual thoroughly before attempting repair or maintenance work on this machine. Failure to understand the information contained in this manual could result in an accident or a decline in the performance or condition of the machine.

YANMAR AGRICULTURAL EQUIPMENT CO.,LTD.

Download full manual at youfixthis.com

VI Front Axle ---------- 102

1. Structure and functions ----------103
   1-1. Front wheel alignment ----------103
   1-2. Structure ----------104
2. Disassembly and Reassembly ----------105
   2-1. Maintenance standards ----------105
   2-2. Development view ----------106
   2-3. Replacing the axle ----------107

VII Rear Axle and Brake ---------- 108

1. Structure and Functions ----------109
   1-1. Structure ----------109
   1-2. Structure of differential gear unit----------110
   1-3. Structure of braking device ----------111
2. Disassembly and Reassembly ----------113
   2-1. Maintenance standards ----------113
   2-2. Development view ----------113
   2-3. PTO clutch and differential mechanism ---------114
   2-4. Braking device ----------116
   2-5. Axle oil seal ----------117
   2-6. MID PTO case ----------118

VIII Power Steering ---------- 120

1. Structure and Functions ----------121
   1-1. Structure ----------121
   1-2. Components ----------122
   1-3. Operation of power steering valve and flow of oil ----------123
2. Checks and Adjustments ----------125
   2-1. Measuring the power steering relief pressure ----------125
   2-2. Troubleshooting ----------125

IX Hydraulic lifting unit ---------- 126

1. Structure and Functions ----------127
   1-1. Structure ----------127
   1-2. Hydraulic circuit ----------128
   1-3. Components ----------129
   1-4. Operation of position control valve and flow of oil ----------133
   1-5. Position control ----------135
   1-6. Hydraulic outlets ----------138
2. Checks and Adjustments ----------139
   2-1. Adjusting the feedback link ----------139
   2-2. Measuring the hydraulic relief pressure ---------140

X Electrical Equipment -------- 142

1. Engine starting circuit ----------143
   1-1. Positions and functions of components ----------143
   1-2. Circuit diagram ----------145
   1-3. Check items for electrical components --146
2. Charging Circuit ----------149
   2-1. Positions and functions of components ----------149
   2-2. Circuit diagram ----------151
   2-3. Check items for electrical components --152
3. Preheating Circuit ----------154
   3-1. Positions and functions of components ----------154
   3-2. Circuit diagram ----------157
   3-3. Check items for electrical components --158
4. Fuel Circuit ----------161
   4-1. Positions and functions of components ----------161
   4-2. Circuit diagram ----------163
   4-3. Check items for electrical components --164
5. Warning Circuit ----------166
   5-1. Positions and functions of components ----------166
   5-2. Circuit diagram ----------168
   5-3. Check items for electrical components --169
6. Safety Circuit ----------170
   6-1. Positions and functions of components ----------170
   6-2. Circuit diagram ----------173
   6-3. Check items for electrical components --175
7. Cabin Circuit ----------178
   7-1. Positions and functions of components ----------178
   7-2. Circuit diagram ----------181
   7-3. Check items for electrical components --182

XI Appendixes ---------- 184

1. Hydraulic Circuit Diagram ----------185
2. Electrical Wiring Diagram ----------186

PREVIEW - YOUFIXTHIS.COM

Download full manual at youfixthis.com

PREVIEW ONLY

You're viewing 12 of 189 pages

The full manual includes:

- All 189 pages, complete
- Searchable PDF (find any keyword)
- No watermarks
- Instant download
- Print-ready quality

GET FULL MANUAL NOW

Yanmar EF227H/230H/233H/235H Technical Manual

Scan or click anywhere
youfixthis.com

Click anywhere on this page to get the full manual