YANMAR

TECHNICAL MANUAL

DIESEL TRACTOR

EF453T

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SYMBOL INDICATION

1 Safety-alert Symbol

This is the safety-alert symbol. When you see this symbol on your tractor or in this manual, personal injury is possible or even likely if you do not follow the advice given. Read the messages that follow carefully.



2 Signal Words

The signal words "DANGER" "WARNING" "CAUTION" are used with the safety-alert symbol.

(1) "DANGER" indicates the extreme hazard that would result in high probability of irreparable injury if proper precautions are not taken.

(2) "WARNING" indicates the hazard that would result in injury if proper precautions are not taken.

(3) "CAUTION" indicates the general precautions.



3 Service Instructions

(1) This stop symbol indicates an important message about proper operation or service. When you see this symbol, read the message that follows carefully.

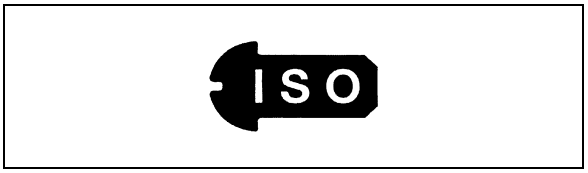


(2) NOTE describes precautions to take while working.



4 Measurements

This tractor is based on metric measurements. All hardware is therefore metric (ISO). Make sure to use the specified metric hardware when service is necessary.



5 Direction

The right and left sides of the tractor are determined by facing in the same direction as the tractor moves when going forward.



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0.3.3 SCREW TIGHTENING TORQUE TABLE

Tighten screws, bolts and nuts according to the table below. If the tightening torque is specified, follow the specification.

General tightening torque Unit: N-m (kgf-m)

Items	Thread diameter	Tightening torque
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	M8	13.0 - 16.4 (1.3 - 1.7)
	M12	24.5 - 34.3 (2.5 - 3.5)
	M14	39.2 - 49.0 (4.0 - 5.0)
	M16	49.0 - 58.8 (5.0 - 6.0)

General tightening torque of bolts N-m (kgf-m)

	Standard thread screw	
Nominal size	4T	7T
M6	4.90 - 6.86 (0.5 - 0.7)	8 - 12 (0.8 - 1.2)
M8	12.74 - 16.66 (1.3 - 1.7)	23 - 29 (2.3 - 3.0)
M10	24.50 - 34.36 (2.5 - 3.5)	44 - 59 (4.5 - 6.0)
M12	44.10 - 58.80 (4.5 - 6.0)	78 - 98 (8.0 - 10.0)
M14	68.80 - 83.30 (7.0 - 8.5)	118 - 147 (12.0 - 15.0)
M16	107.80 - 137.20 (11.0 - 14.0)	167 - 206 (17.0 - 21.0)
M18	156.80 - 186.20 (16.0 - 19.0)	235 - 284 (24.0 - 29.0)
M20	215.60 - 264.60 (22.0 - 27.0)	324 - 402 (33.0 - 41.0)



IMPORTANT

- **The tightening torque of fine thread screws shall be 80% of that of the standard thread screws.**
- **To tighten any aluminum part, apply torque equivalent to 80% of the specified value.**
- **Recently, all the bolts may be standardized to 7T bolts under the plant line management of Yanmar.**
- **When 7T bolt is used with rubber, rubber packing or aluminum parts, tighten the bolt following the values in the 4T-bolt table.**

Bolt standard

		4T	7T
Tensile Strength (kgf/sq.mm)	Minimum	40	70
Brinell Hardness (Hb)	Minimum	105	201
	Maximum	229	277
Yield Point (kgf/sq.mm)	Minimum	23	50

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0.3.7 SPECIFICATIONS

Model			**EF453T**
Drive type			4-wheel Drive
Dimensions	Overall length (mm)		3,230
	Overall width (mm)		1,605
	Overall height (mm)		1,534 (ROPS 2,459)
	Wheelbase (mm)		1,830
	Tread	Front (mm)	1,290 - 1,570
		Rear (mm)	1,270 - 1,830
	Ground clearance (mm)		375
Weight (kg)			1,450 (ROPS 1,485)
Engine	Model		4TNV88
	Type		4-cycle, water-cooled diesel
	Output (SAE Gross) (HP/rpm)		45/2,700
	Number of cylinders		4
	Bore x Stroke (mm)		88 x 90
	Displacement (cc)		2,189
	Air cleaner		Dry, dual element
	Fuel tank capacity (liter)		40
	Battery		12V-64AH
Steering			Hydrostatic
Clutch			Dry, single
Brake			Mechanical, wet disc
Transmission	Type		Collar shift
	Gear shift (Forward x Reverse)		F9 x R9
	Forward speed (km/hr)		1.6-27.8
	Reverses speed (km/hr)		1.6-28.6
	Max. speed, forward (km/hr)		29.7
Tire	Front		8-18-6
	Rear		13.6-26
Rear PTO	Type		Continuous live PTO
	PTO shaft		SAE1-3/8 inch (35mm), 6 spline
	Speed (rpm)		547 741 at rated engine speed
Hydraulic	Type		Position control
	Hitch		3 point hitch, category SAE #1
Draw bar hitch			Clevis type

NOTE:
All technical data, measurement and weight are approximate, and the manufacturer has the right to make alteration without prior notice.

0.3.8 TRACTOR MASS AND TIRE SPECIFICATION

TIRE SIZE (Number of plies)		**FRONT AXLE**		**REAR AXLE**	
		Maximum working load of tires	Technically permissible mass on each axle	Maximum working load of tires	Technically permissible mass on each axle
F: 8-18(6), R: 13.6-26(4)	kg	650	980	1065	1675

IMPORTANT
Set up the implement so that the front wheel load and the rear wheel load are not greater than the smaller of the following: the permissible load capacity of the tires or the technically permissible mass on each axle.

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1.1 CHECK INTERVALS

x: Checks required

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
Engine oil element	Replace					Replace						Replace
Transmission oil	Replace	x	x	x	x	Replace	x	x	x	x	x	Replace
Line filter (Hydraulic)	Replace					Replace						Replace
Transmission oil strainer	Clean					Clean						Clean
Fuel filter						Replace						Replace
Water separator element	Clean			Clean		Replace		Clean		Clean		Replace
Radiator interior	Clean the interior of radiator when replacing cooling water											
Cooling water	Check before every work / Replacing every year											
Front axle oil	Replace	x	x	x	x	Replace	x	x	x	x	x	Replace
Air cleaner element	x	x	x	x	x	Replace	x	x	x	x	x	Replace
Radiator screen	x	x	x	x	x	x	x	x	x	x	x	x
Clean cooling fan, radiator	x	x	x	x	x	x	x	x	x	x	x	x
Battery liquid level	Check before every work											
Battery liquid gravity		x		x		x		x		x		x
Fuel piping, connections	x	x	x	x	x	x	x	x	x	x	x	x
Rubber hoses (Power steering)	x	x	x	x	x	x	x	x	x	x	x	x
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	x	x	x	x	x	x	x	x	x	x	x	x
Grease-up	x	x	x	x	x	x	x	x	x	x	x	x
Fastening of steering wheel fix nut		x		x		x		x		x		x
Important nuts and bolts	x	x		x		x		x		x		x
Cooling fan belt	x	x		x		x		x		x		x
Engine breather pipe	x	x	x	x	x	x	x	x	x	x	x	x
Engine crank case												x
Clearance of exhaust valve												x
Fuel injection valve												x
Generator, start motor	x	x				x				x		
Hydraulic system	x	x				x				x		

Break-in period is 50 hours. If not reached, take up 1 year instead.
Items marked "Replace" should be replaced every two years even before suggested time intervals.
Replace the power steering hoses every 2 years.

1.2 OIL AND GREASE

OIL, GREASE	Type
Fuel	Diesel fuel only
Engine oil	SAE 30 or 40 API Grade CD or better
Grease	Multipurpose Grease
Transmission oil, Hydraulic system oil	TF-500 Transmission fluid

* At temperature below – 10°C, use Super No.3 light oil.

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1.3 OIL AND WATER VOLUME

(Unit: liters)

		EF453T	Oil type
Fuel		40	Diesel light oil
Cooling water	Radiator	4	Anti-rusting fluid
	Sub-tank	0.45	Anti-rusting fluid
Engine oil		5.3	10W-30, API Grade CD
Transmission oil		27	TF-500A Transmission fluid
Front axle oil		7.5	TF-500A Transmission fluid

1.4 EQUIVALENT TO TF-500

Supplier	Brand name
Mobil	Mobil Fluid 425, 424
Castrol	Agricastrol MP, CASTROL UTF
Shell	Tellus Oil 32 or 37, Donax TD
Ford	ESN-M-2C-134A
Esso	Torque Fluid 56
John Deere	J20B, J14A
BP	Tractran UTH

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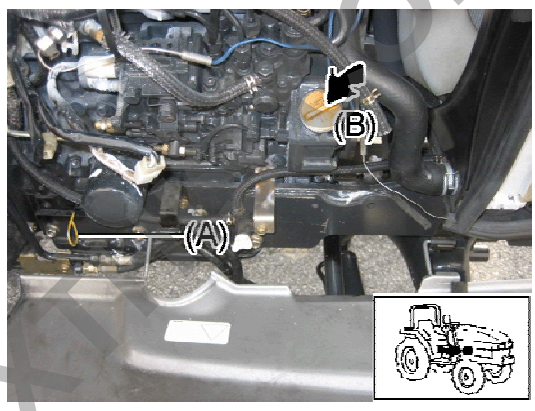
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1.5 REPLACING OIL

DANGER
Never add oil while the engine is warm or running.
A fire may occur.

CAUTION
Never add oil just after stopping the engine. You may be burned.

Engine oil



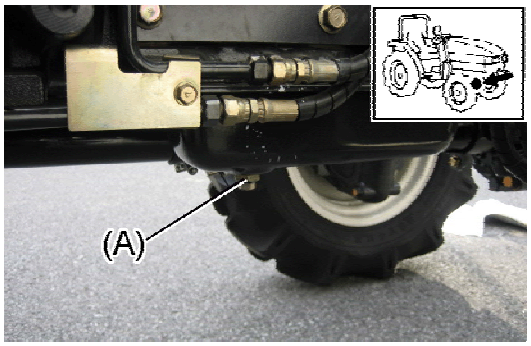
Check
Draw out the oil gauge on the right side of the engine and wipe off oil with a cloth. Reinsert and remove it again to see if the oil level is within the upper and lower marks.

If insufficient, add the new oil as much as the normal level through the supply port.

(A) Oil gauge
(B) Oil supply port

NOTE:
Check the oil level before the engine starts or when the engine is cool.

Replacing oil
Remove remaining oil through the drain plug on the lower part of the engine. Add the new oil through the oil supply port. Select a proper type of engine oil and replace it periodically considering the temperature and operating conditions.



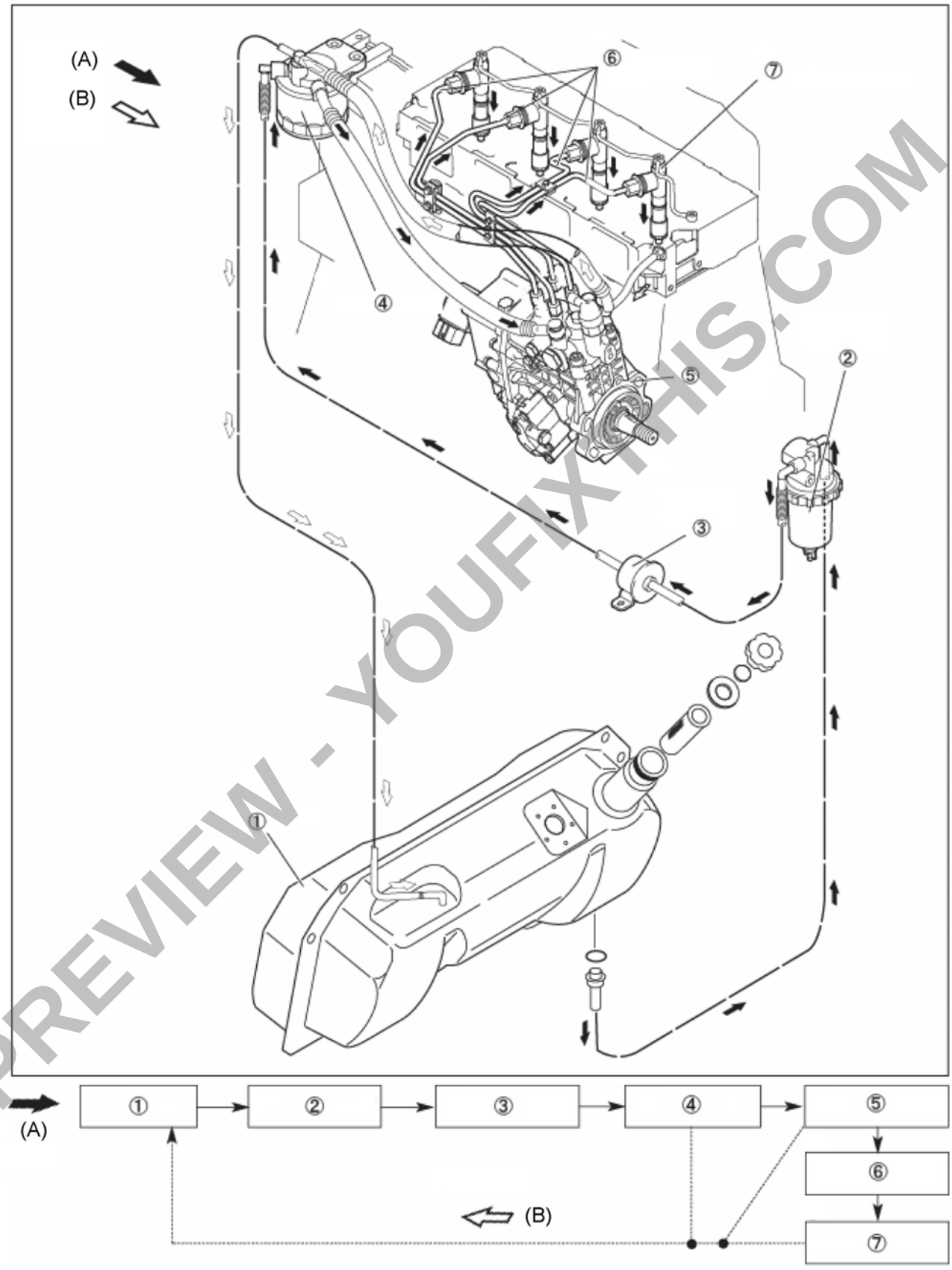
(A) Drain plug

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3.1 FUEL SYSTEM

3.1.1 Flow of fuel and layout of components



(1) Fuel tank
(2) Water separator
(3) Fuel feed pump
(4) Fuel filter
(5) Fuel injection pump
(6) High-pressure tubes
(7) Injection nozzles
(A) Feed
(B) Return

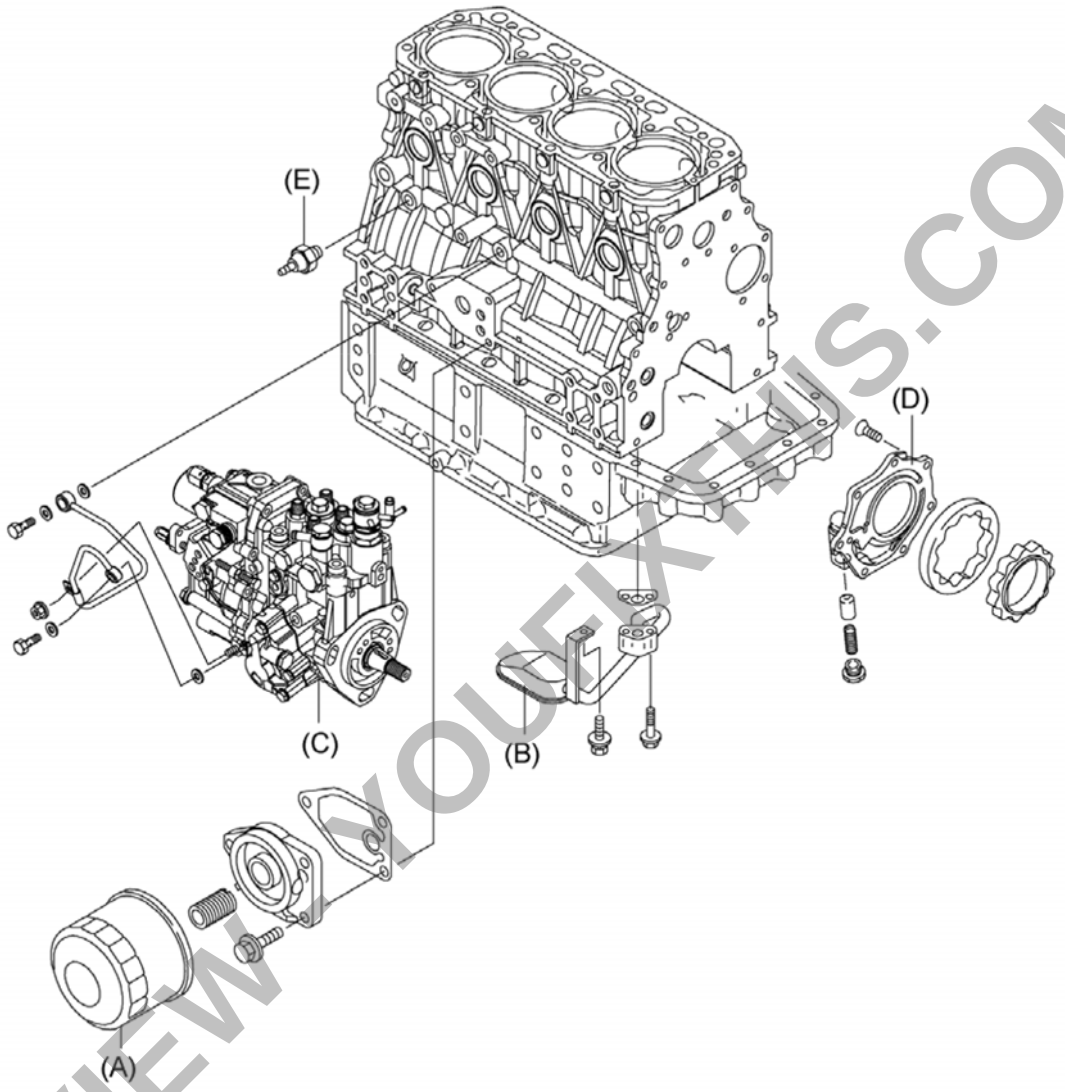
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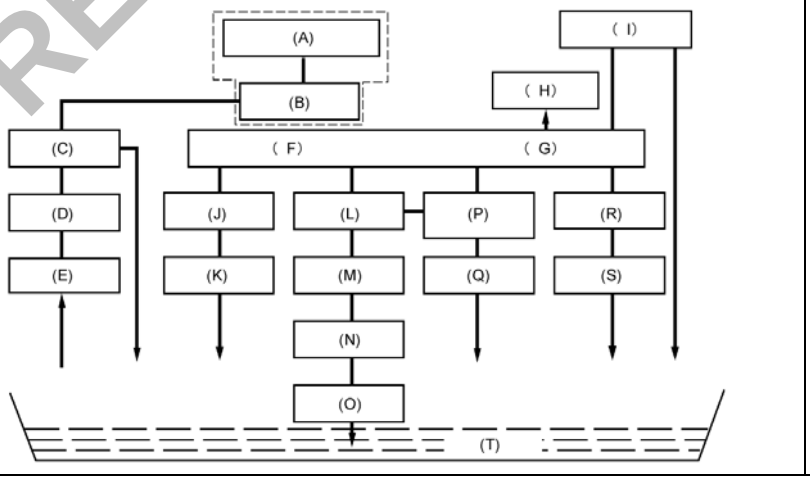
3.3 LUBRICATING OIL SYSTEM

3.3.1 Flow of lubricating oil

The oil in the oil pan passes through the strainer, is sucked up by the lubricating oil pump, and then lubricates the interior of the engine block and cylinder head through the oil filter and cooler.



(A) Oil filter
(B) Strainer
(C) Fuel injection pump
(D) Lubrication pump
(E) Hydraulic pressure switch

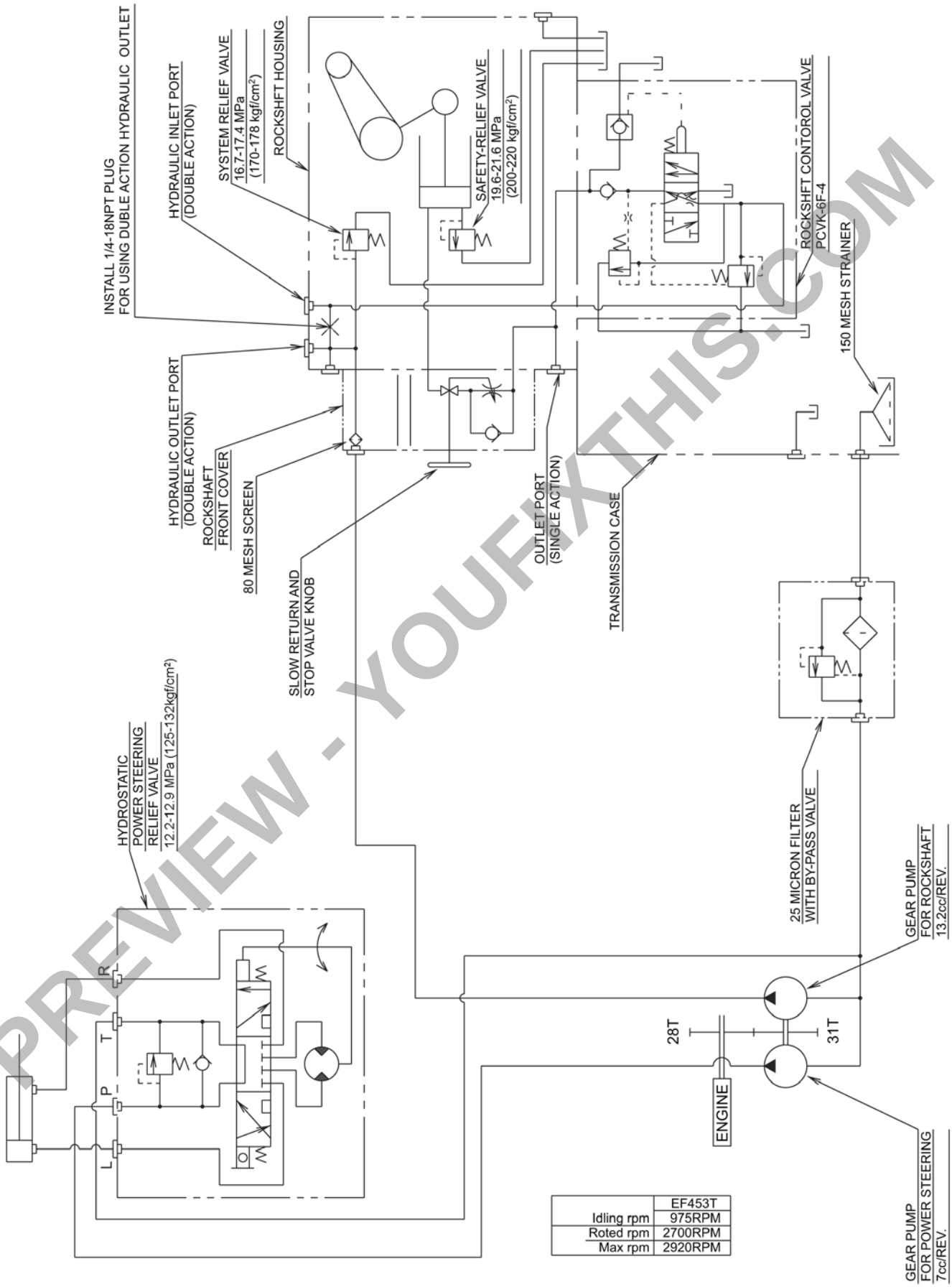


(A) Relief valve (bypass)
(B) Lubricating oil filter
(C) Regulator
(D) Lubricating oil pump
(E) Lubricating oil filter
(F) Cylinder body
(G) Main gallery
(H) Hydraulic switch
(I) Fuel injection pump
(J) Intermediate gear shaft
(K) Gear shaft
(L) Cam bearing
(M) Valve arm pin
(N) Valve arm
(O) Tappet-cam face
(P) Crank journal
(Q) Crank pin
(R) Injection nozzle
(S) Piston
(T) Oil pan

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11.1 HYDRAULIC CIRCUIT DIAGRAM



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