SERVICE MANUAL

TT35 / TT40 / TT45

Tractor

Part number 47899736

English

September 2015

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Steering control - General specification – Mechanical steering

Type	Manual worm and roller type
Make	ZF
Reduction ratio	23.7:1 (lever at centre)
No. of turns	4.3
Steering column angle	**61 °**
Oil capacity (approximately)	**560 mL (19 US fl oz)** (approximately)
Oil type	**SAE 90 / 140**
Oil change period	**1200 h**

Steering control - General specification – Hydrostatic steering

Type	Hydrostatic
Make	DANFOSS
Hydraulic circuit	Independent, separate pump
Oil reservoir	Transparent plastic on right-hand side of engine
Oil filter	In oil reservoir, gauze
Hydraulic pump	
Type	Gear
Model	C-25
Make	Dowty
Drive	From engine valve gear
Rotation (seen from rear)	Clockwise
Drive ratio	1 to 0.931
Rated speed (at engine governed speed)	**2328 RPM**
Rated output at maximum rated speed	**26.4 L/min (7.0 US gpm)**
On-bench output at **1450 RPM (70 102 Kg/cm²)**	
• New or reconditioned pump	**15.3 L/min (4.0 US gpm)**
• Used pump	**10.7 L/min (2.8 US gpm)**
• Test oil temperature	**55 - 65 °C (131 - 149 °F)**
• Test oil viscosity	**SAE 20**
Drive/driven gear journal diameter	**17.400 - 17.418 mm (0.685 - 0.686 in)**
Bearing bore diameter	**17.450 - 17.470 mm (0.687 - 0.688 in)**
Gear journal clearance in bearing	**0.032 - 0.070 mm (0.001 - 0.003 in)**
Maximum wear clearance	**0.100 mm (0.004 in)**
Gear clearance in pump body	**0.020 - 0.064 mm (0.001 - 0.003 in)**
Maximum wear clearance	**0.100 mm (0.004 in)**
Bearing width	**19.812 mm (0.780 in)**
Gear width	**18.348 mm (0.722 in)**
Pump body width	**58.072 - 58.122 mm (2.286 - 2.288 in)**
Bearing and gear end clearance in pump body (to be restored on overhaul)	**0.1 - 0.2 mm (0.004 - 0.008 in)**
Control valve	DANFOSS
Type	With steering column operated rotary valve (permitting steering also in case of pump failure)
Outfit code • DANFOSS (with valves in control valve)	OSPC 1 00
Relief valve setting	**100 - 110 bar (1450 - 1595 psi)**
Power cylinder overload valve setting	**200 bar (2900 psi)**
Power cylinder	
Type	Double acting, located front of front axle
Make	WEBER, or SIMA ERBER
Cylinder bore diameter	**48 mm (2 in)**
Piston rod diameter	**22 mm (1 in)**

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Steering control - Troubleshooting – Mechanical steering

Problem	Possible Cause	Correction
Wobbling	Knuckle joint pin wears off	Renew knuckle joint
	King pin/spindle bush wear off	Renew bushes
	Steering play	Adjust the play by adding or removing shims at worm shaft flange
	Wrong wheel alignment	Check and correct toe-in
	Steering roller shaft loose/play	Adjust the play
One side pulling	Tire pressure less	Check tire pressure and inflate accordingly
	Knuckle joint wears off	Renew knuckle joint
	Wrong wheel alignment	Check and correct toe-in
	Spindle bush tight	Check and renew bushes
	Play between arm and spindle	Renew the worn-out parts
	Wheel bearing play	Check bearing pre-loading and adjust
	More wear on a tire	Renew the wear off tire
	Rim run out	Change rim
	Axle bearing broken/damaged/tight	Renew bearings
Hard steering	Oil level/quality	Check and replace/top-up
	Tyre pressure	Check and inflate to correct pressure
	Grease less	Clean and grease
	Wheel alignment	Check toe-in setting
	Spindle seize in bush	Renew bush/repair spindle
	Excessive wear of tire	Retread/change tire
	Thrust washers damaged	Renew thrust washers
	Wrong play setting in steering assembly	Check and adjust

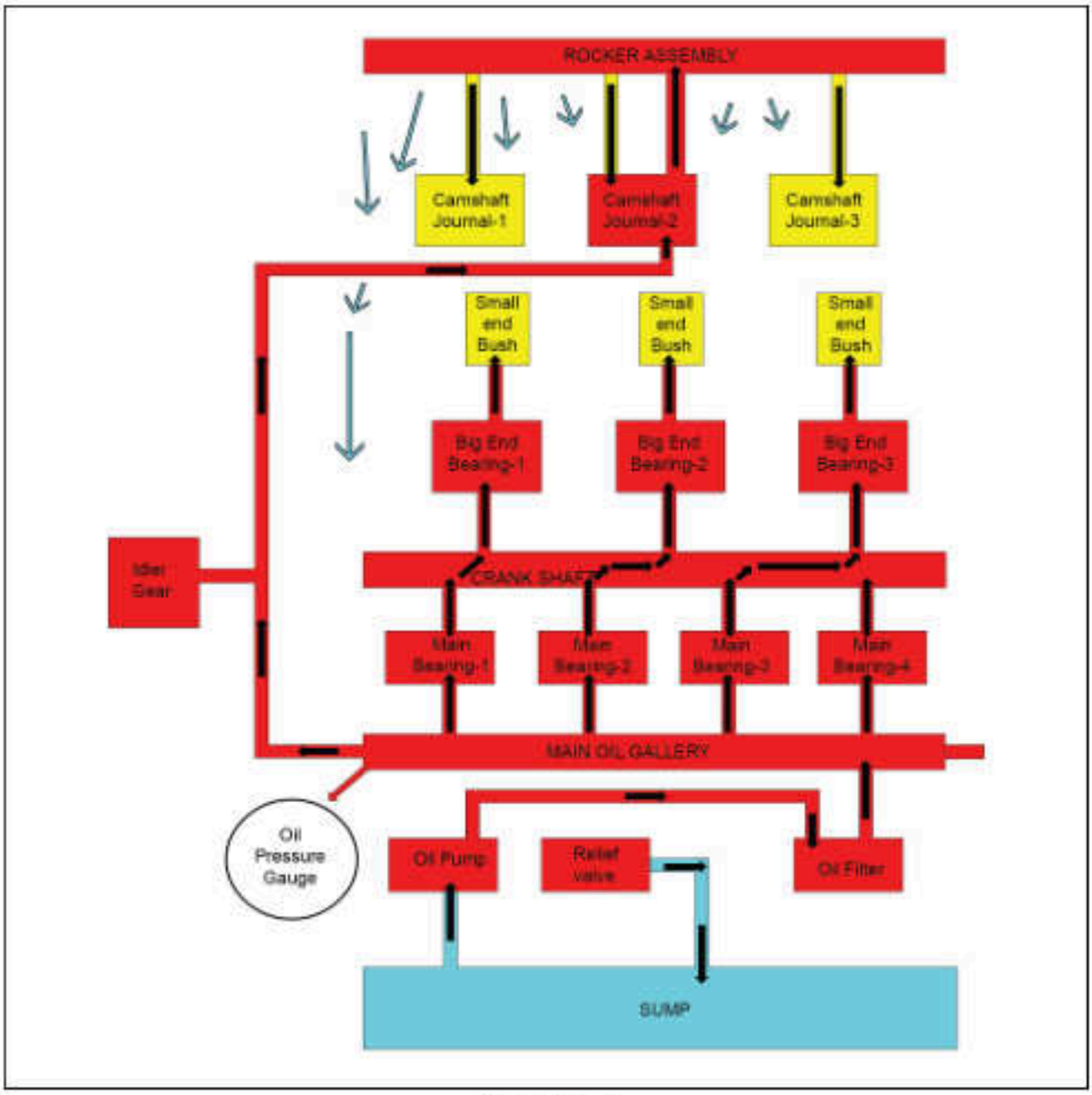
Steering control - Troubleshooting – Hydrostatic steering

Problem	Possible Cause	Correction
Steering wheel is heavy to turn	No or insufficient oil pressure a) Pump does not run b) Pump defective c) Pump runs in the wrong the direction d) Pump is worn out e) Pump is under dimensioned	 Start up pump (loose V-belt) Repair or replace pump Correct direction of rotation of pump or replace pump Replace pump Install a larger pump (examine pressure need and flow)
	Pressure relief valve is stuck in open position or setting pressure is too low	Repair or clean pressure relief valve. Adjust the valve to the correct pressure
	Priority valve is stuck in open position	Repair or clean the priority valve
	Too much friction in the mechanical parts of the vehicle	Lubricate bearings and joints of steering gear or repair if necessary. Check steering column installation
	Emergency steering balls missing	Install new balls
	Combination: Downstream system + steering unit with suction valve and differential cylinder are inexpedient	Change cylinder type (through going piston rod). If necessary use two differential cylinders
Regular adjustments of the steering wheel are necessary ("snake-like driving")	Leaf spring without spring force or broken	Replace leaf springs
	Spring in double shock valve broken	Replace shock valve
	Gear wheel set worn	Replace gear wheel set
	Cylinder seized or piston seals worn	Replace defective parts
Neutral position of steering wheel cannot be obtained, i.e. there is a tendency towards "Motoring"	Steering Column and steering unit out of line	Align the steering column with steering unit

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Harnesses and connectors - Electrical schematic sheet 01

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Fuel system

The diesel fuel system consists of fuel tank, fuel filters, fuel feed pump, injection pump, injector nozzles and inter connecting tubes and lines.

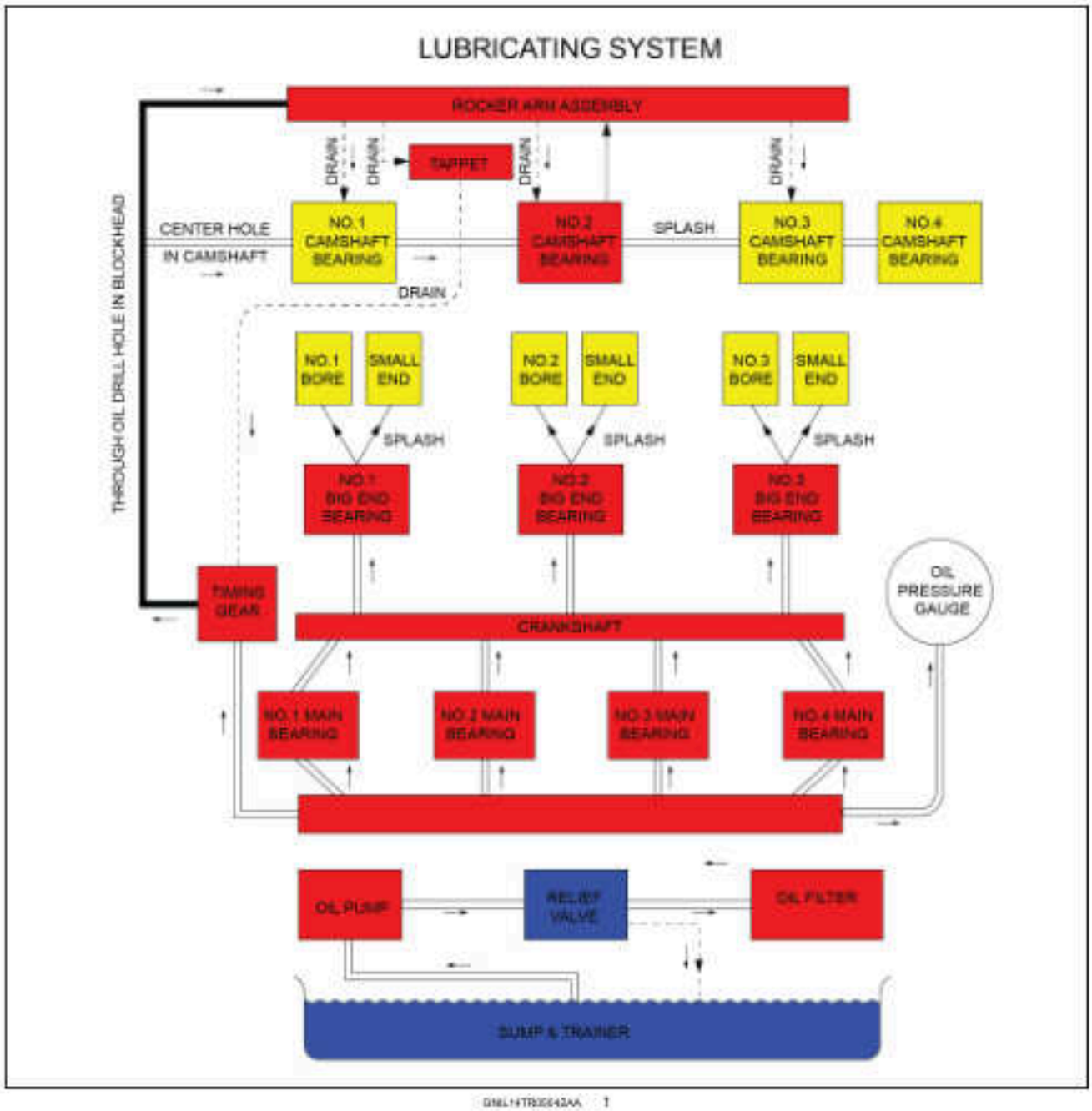
The injection pump is located on left side of the engine, is pressure fed from fuel feed pump. Fuel flows from fuel tank to the fuel feed pump strainer, through feed pump and then through the fuel filters.

From the filter the fuel passes to the injection pump to supply fuel at high pressure to each injector. The extra fuel from injection pump and injectors is recirculated by means of the leak offline to the fuel tank.

Fuel shut-off

Supply of fuel to the combustion chamber is stopped by means of a pull type knob provided just below the rear hood.

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The small end bushes are lubricated by splash and lubricating oil mist.

Running across the front of the cylinder block is an internal passage which connects with the pressure rail. The oil comes out from this passage to camshaft 1st journal and flows through the central hole running to full length of hollow camshaft. Cross drilling from this central hole delivers oil to 2nd, 3rd and 4th camshaft journals.

Oil under pressure is feed to rocker shaft though a vertical and a cross drilled passages from oil gallery.

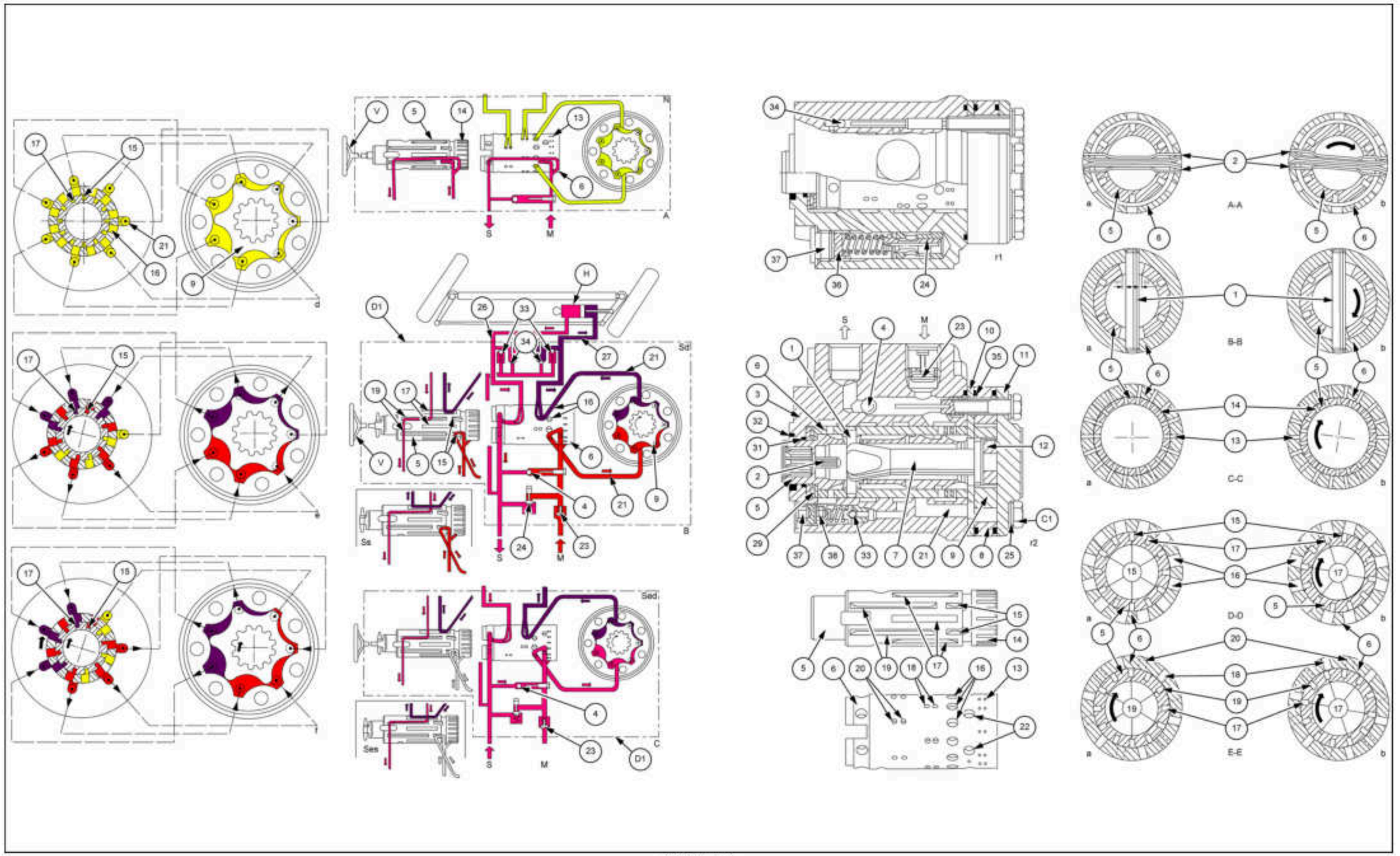
The overflow of oil from the rocker shaft flows from the cylinder head into the camshaft tunnel and from the front of the tunnel on to the timing gears and then returns to the sump.

Lubrication of the timing gear idler hubs is by a force feed.

Lower hub

A drilling from the front face of the cylinder block into the main bearing oil gallery, is aligned with a drilling which passes through the axle of the hub, connecting with a transverse hole in the hub, through which oil is fed to the bearing surfaces of the hub gear.

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