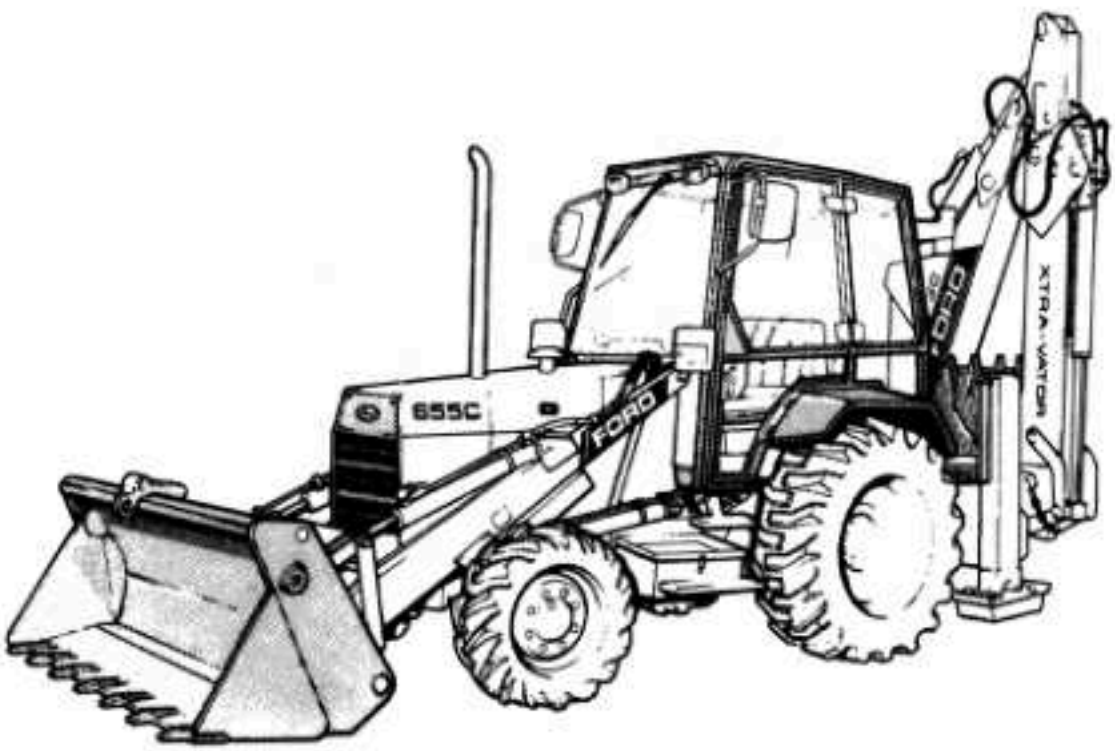
FORD

Service Manual

Tractor Loader Backhoe
455C, 555C, 655C



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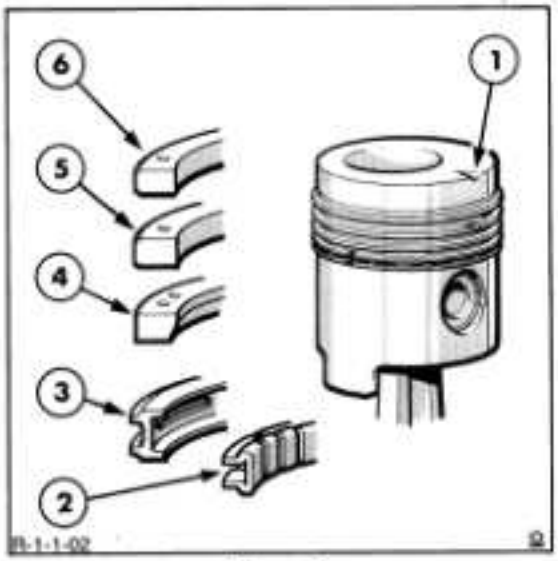


Figure 2
Conventional Piston and Rings

1. Notch to Front of Engine
2. Expander for Oil Control Ring
3. Oil Control Ring
4. 1st Compression Ring
5. 2nd Compression Ring
6. Top Compression Ring

Pistons

Pistons are an aluminium alloy with combustion chambers recessed into the piston crowns. Each piston, Figure 2, has three compression rings and one oil control ring, all of which are located above the piston pin.

Connecting Rods

The piston connecting rods are of 'I' section, with replaceable bronze piston pin bushings. Full-floating piston pins are retained by two snap rings in each piston.

Manifolds

The cast iron intake and exhaust manifolds are on opposite sides of the cylinder head for better heat distribution in the head, and less heat transfer to the intake manifold. All tractors are fitted with vertical exhaust systems.

The intake manifolds are connected through tubing to the air cleaner. The diesel engine intake manifold is provided with a tapped hole for installation of a thermostart or an ether cold starting aid kit.

NOTE: *On tractors where cold start equipment is not installed, the plug in the manifold should remain securely installed at all times, since considerable damage to the cylinder bores could result from its absence. The cylinder bores can also be damaged by grit and other foreign matter passing through the air cleaner hose connections if they are not properly secured.*

Cylinder Block Assembly

The cylinder block is alloy cast iron with heavy webbing and deep cylinder skirts. The block features full length water jackets for cooling the cylinders, which are bored integral with the block. Cylinders are in-line and vertical, and numbered from 1 to 3, front to rear.

The oil pan is attached to the bottom of the cylinder block and is the sump for the lubrication system. The engine front cover is attached to the front engine adapter plate forming a cover for the timing gears.

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HARNESS ROUTING

Engine and Transmission Harness

The engine and transmission harness, Figure 5, is routed along the length of the engine and connects the harness to the instrument and lighting harness.

The engine and transmission harness connects the following components to the electrical system:

- P.T.O. Safety start switch (Ford 455C with 8 × 8 transmission)
- Fuel tank level sender.
- Air cleaner restrictor switch.
- Water temperature warning switch.
- Water temperature switch.
- Starter motor solenoid.
- Starter motor.
- Fuel shut off solenoid.
- Horn.
- Oil pressure switch.
- Alternator.
- Tachometer sensor.
- Transmission control valve and solenoids.
- Transmission oil temperature sender.
- Thermostart.
- Air conditioning compressor clutch.
- Battery temperature sender.
- Battery.

Also connected to the engine/transmission harness is the wiring for the hydraulic filter pressure differential switch and transmission disconnect buttons. On 555C and 655C Units the wiring for the loader return to dig system is also incorporated. A snap type connector located in close proximity to the loader control valve is used to connect this wiring to the engine/transmission harness.

Steering Console Harness

The steering console harness, Figure 6, is adaptable to suit both North American and Canadian markets (NASO) and all markets except North America and Canada (ISO) lighting requirements. In order to achieve this adaptability two turn indicator connectors are provided in the harness, one for NASO and a second for ISO requirements. When the harness is connected only the appropriate connector for the vehicle build is used and the remaining connector left disconnected. Similarly, where an electrical component is not fitted the connector or wiring is also left free beneath the console after ensuring any bare wires are fully insulated to prevent a short circuit from occurring.

The steering console harness connects the following components to the electrical system.

- Brake light switch.
- Transmission control lever.
- Transmission modulator.
- Indicator light panel.
- Stop light switch.
- Washer motor.
- Turn indicator switch.
- Accessory socket.

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PART 6

POWER TAKE-OFF

Chapter 2
TROUBLE SHOOTING, SPECIFICATIONS AND SPECIAL TOOLS

Section		Page
A.	TROUBLE SHOOTING	1
B.	SPECIFICATIONS	2
C.	SPECIAL TOOLS	3

A. TROUBLE SHOOTING

IMPORTANT: *Whenever effecting a repair the reason for the cause of the problem must be investigated and corrected to avoid repeat failures.*

The following table lists problems and their possible causes with recommended remedial action.

PROBLEM	POSSIBLE CAUSES	REMEDY
P.T.O. will not engage with load or stop without load	1. Low rear axle oil level	Check level and top-up
	2. Selector lever linkage broken	Inspect and repair
	3. I.P.T.O. pump fails	Pressure test pump
	4. Fracture of clutch feed tube	Inspect and repair
	5. Broken I.P.T.O. control valve	Check valve operation, renew components if necessary
	6. Pressure regulating valve broken	Check valve operation, renew components if necessary
P.T.O. will not engage with load but shaft stops without load	1. I.P.T.O. clutch to support sealing rings leak	Inspect and renew rings
	2. I.P.T.O. control valve piston stuck or spring broken	Inspect and renew components
	3. I.P.T.O. clutch plates worn or teeth broken	Inspect and renew plates
	4. I.P.T.O. clutch piston seals leaking	Inspect and renew seals
	5. I.P.T.O. clutch piston or housing cracked	Inspect and renew components if necessary
	6. Blocked I.P.T.O. oilways	Inspect and repair

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B. SPECIFICATIONS – STEERING

POWER STEERING MOTOR

Type	Hydrostatic
Steering Wheel Turns Lock to Lock	
Two Wheel Drive Axle	4.1
Four Wheel Drive Axle – Left Turn	3.1
Four Wheel Drive Axle – Right Turn	3.75
Upper Cover Shim Sizes	0.0025 in (0.064 mm) 0.005 in (0.127 mm) 0.010 in (0.254 mm) 0.030 in (0.762 mm)

POWER STEERING PUMP

Type	Gear
Pump Output at 1000 rev/min	3.0 Imp. Gal/min 3.6 U.S. Gal/min 13.6 Litres/min
Pump Output at 2200 rev/min	6.6 Imp. Gal/min 7.9 U.S. Gal/min 29.9 Litres/min
Relief Valve Pressure	1850 ± 50lbf/in² at 1100 rev/min 128 ± 3.5 bar
Shim Thickness	Pressure Change
0.010 in (0.25 mm)	66 – 74 lbf/in² (4.54 – 5.10 bar)
0.015 in (0.38 mm)	99 – 110 lbf/in² (6.82 – 7.58 bar)

OIL SPECIFICATION

Fill with the correct grade, quantity and type of oil as specified in the relevant Operators Manual.

STEERING MOTOR AND PUMP TORQUE SPECIFICATIONS

	Nm	Kgfm	lbf.ft.
Steering Wheel Retaining Nut	54	5.5	40
Steering Motor Securing Bolt	18	1.8	13
Steering Tube to Motor Connections	31	3.2	23
Steering Motor Upper Cover Bolts	27	2.8	20
Steering Motor End Cover Bolts	23	2.3	17
Steering Pump Retaining Bolts	31	3.2	23
Steering Pump Through Bolts	36	3.6	26
Steering Pump Reservoir Bolt	16	1.6	12
Steering Pump Drive Gear Securing Nut	42	4.3	31
Steering Pump Relief Valve	42	4.3	31

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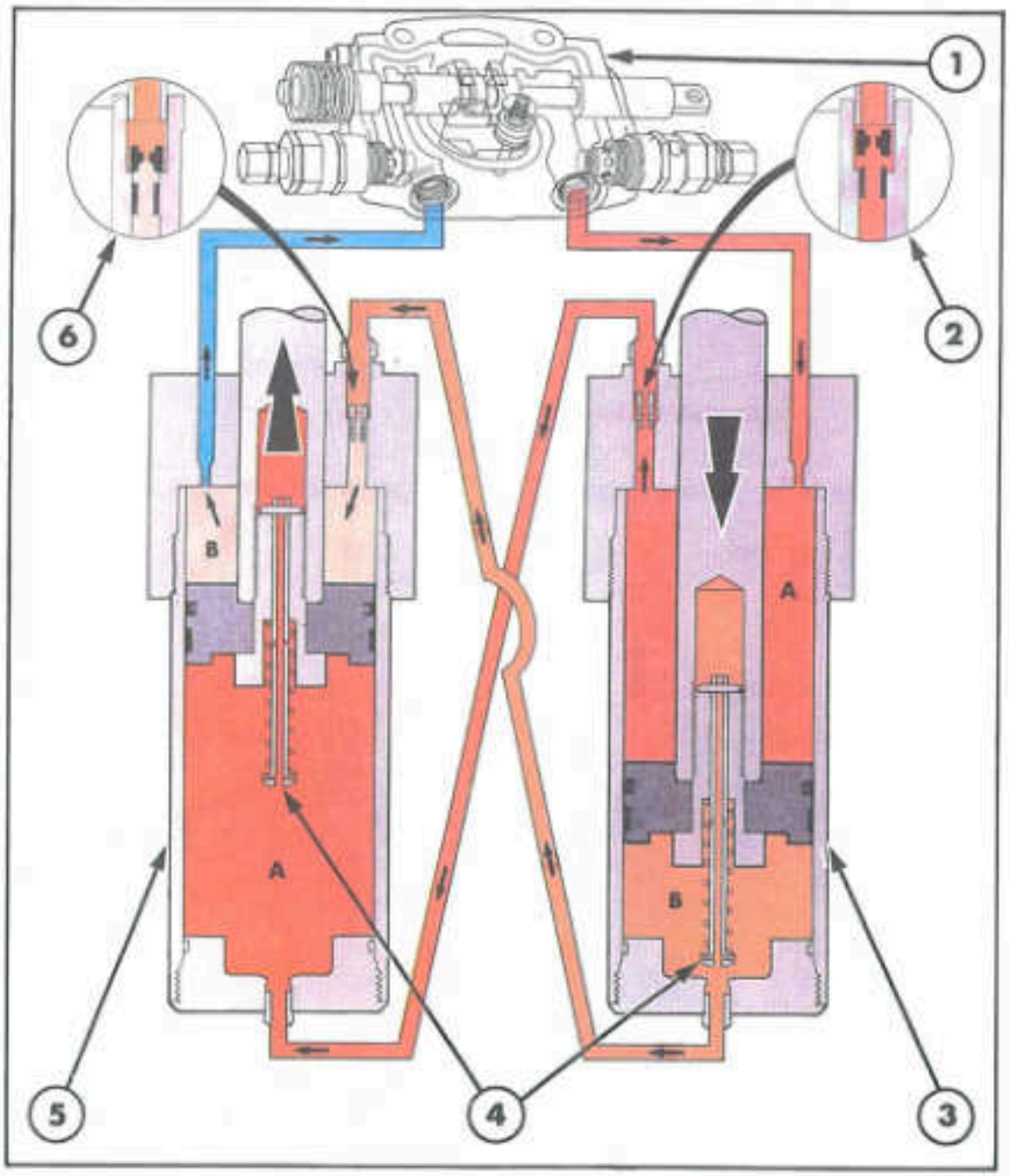


Figure 8
Swing Cylinders – Working Schematic Normal Swing (Centre Pivot shown)

Pump Pressure Oil
1st Stage Restricted Return Oil
2nd Stage Restricted Return Oil
Return to Reservoir Oil

1. Control Valve Swing Section
2. One Way Restrictor
3. Left Swing Cylinder
4. Cushioning Rod
5. Right Swing Cylinder
6. One Way Restrictor

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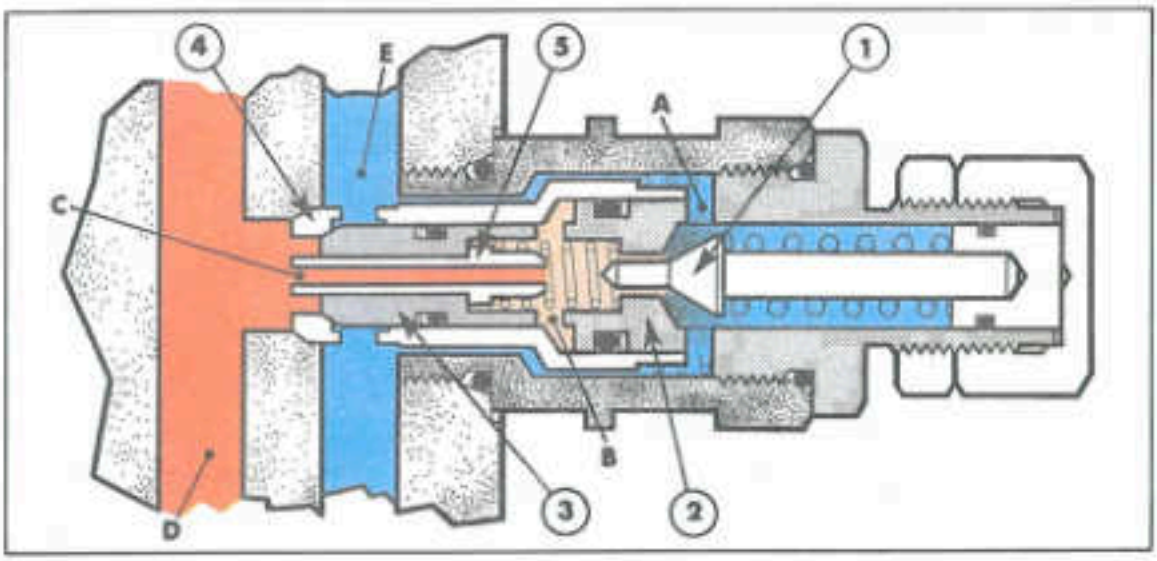


Figure 14
Circuit Relief Valve Pilot Operated with Anti Cavitation Feature
Sectioned View – showing Valve with Initial Pilot Valve Opening

High Pressure Oil | Reduced Pressure Oil | Exhaust/Reservoir Oil

1. Pilot Valve
2. Pilot Valve Body
3. Poppet Valve
4. Sleeve Poppet
5. Piston

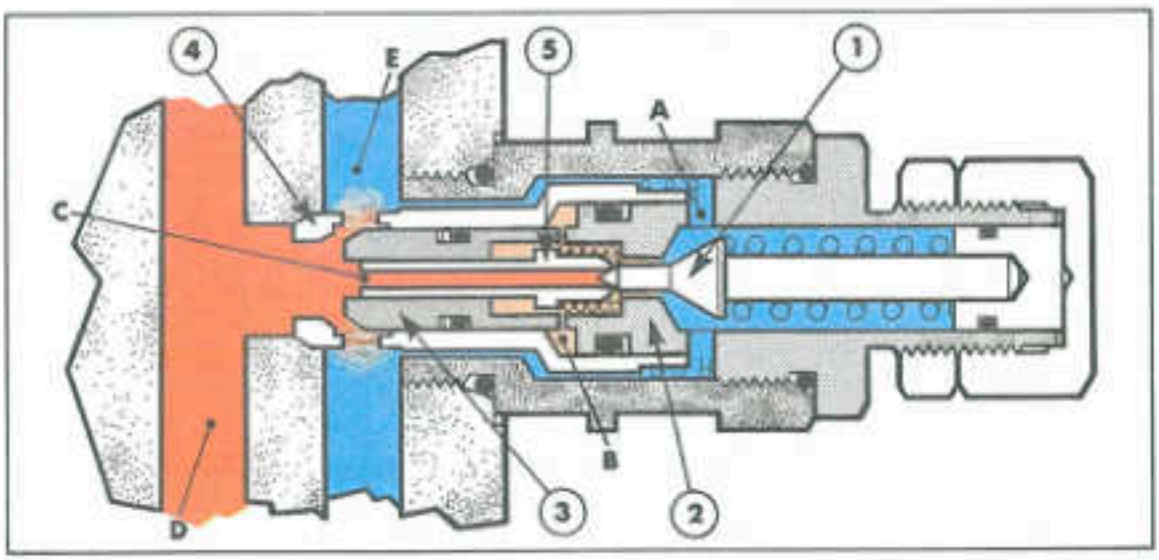
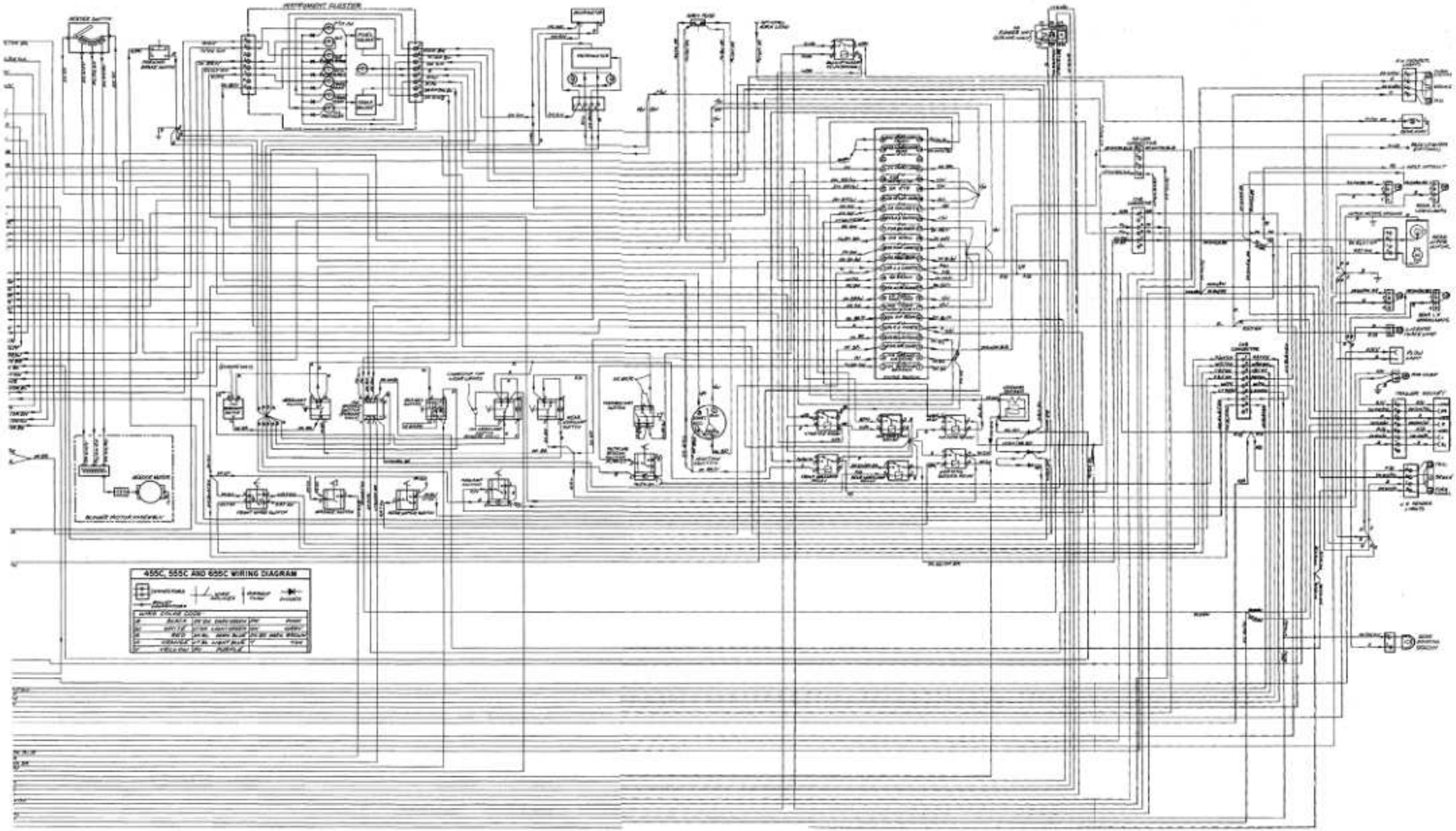


Figure 15
Circuit Relief Valve Pilot Operated with Anti Cavitation Feature
Sectioned View – showing Valve fully relieving High Pressure Oil

High Pressure Oil | Reduced Pressure Oil | Exhaust/Reservoir Oil

1. Pilot Valve
2. Pilot Valve Body
3. Poppet Valve
4. Sleeve Poppet
5. Piston

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