Service Manual

3CX, 4CX,
214e, 214, 215, 217
& VARIANTS

Backhoe Loader

From M/c No. 930000 Onwards
From M/c No. 903000 Onwards (USA)

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ITEM	CAPACITY Litres	CAPACITY UK Gal	FLUID/LUBRICANT	INTERNATIONAL SPECIFICATION
Hydraulic System ③	130	28.6	**JCB High Performance Hydraulic Oil** (Above 38 °C, 100 °F)	ISO VG46
			JCB Hydraulic Fluid HP32 (Below 38 °C, 100 °F)	ISO VG32
Grease Points	---	---	**JCB HP Grease**	Lithium complex NLGI No.2 consistency including extreme pressure additives
			or **JCB Special MPL-EP Grease** ④	Lithium based NLGI No.2 consistency including extreme pressure additives
Extending Dipper	---	---	**Waxoyl** ⑤	
Electrical connections	---	---	As a corrosion and moisture inhibitor all exposed connections should be coated liberally with petroleum jelly.	
Power Sideshift Chains	---	---	**JCB Chain Lubricant**	

① Engines of new machines are filled at the factory with JCB 10W/30 Multigrade oil. This oil should be drained after the first 100 hours operation and the engine filled with the appropriate recommended grade as shown in the lubrication chart. JCB 10W/30 Multigrade should also be used for the first 100 hours operation whenever a new or reconditioned engine is fitted to the machine. After the first 100 hours operation, it is essential that the 10W/30 oil is replaced by the lubricant recommended. The figure quoted is TOTAL system capacity. Use the MIN and MAX marks on the dipstick when filling the system. Figures quoted within ±0.5 litre (0.11 U.K. gal).

② **Note:** The figure quoted is TOTAL system capacity. Use the MIN and MAX marks on the dipstick when filling the system. Figures quoted within ±1.0 litre (0.22 U.K. gal).

③ **Note:** The total hydraulic system capacity depends on the equipment being used. Fill with all rams closed. Watch level indicator on hydraulic tank.

④ **Note:** JCB HP Grease is the recommended specification grease, if using JCB Special MPL-EP then the greasing must be carried out more frequently.

⑤ ⚠ **WARNING:** Waxoyl contains turpentine substitute, which is inflammable. Keep flames away when applying Waxoyl. Waxoyl can take a few weeks to dry completely. Keep flames away during the drying period. Do not weld near the affected area during the drying period. Take the same precautions as for oil to keep Waxoyl off your skin. Do not breathe the fumes. Apply in a well-ventilated area.

GEN-1-3

⑥ **Note:** 4WS axles with limited slip differential must use **JCB Special Gear Oil Plus**.

Coolant Mixtures

⚠ WARNING

Antifreeze can be harmful. Obey the manufacturers instructions when handling neat or diluted antifreeze.

7-3-4-4

The protection provided by JCB Four Seasons Antifreeze and Summer Coolant is shown below. If any other anti-freeze is used, refer to the manufacturer's instructions and ensure that a corrosion inhibitor is included. DO NOT use solutions of more than 60% or less than 50% or damage to the cooling system will occur.

55% Solution - Maintains circulation down to -36 deg C (-33 degF), protects against damage down to -41 deg C (-42 degF)

The strength of the anti-freeze solution must be checked at least once a year, preferably at the beginning of the cold period. It is an advantage to leave the anti-freeze in all the year round as it gives continued protection against corrosion. Always renew the anti-freeze every two years. A 50% anti-freeze mixture must be used even if frost protection is not needed. This gives protection against corrosion and raises the coolants boiling point.

It should be noted that serious damage to the cooling system can occur if corrosion inhibitors are not used.

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Harness Drawing - Hammer Solenoid Valve Link - Component Key - CAD 721/10969 Issue 1

IMPORTANT NOTE: See **Harness Interconnection** pages at the front of the **Harness Data** section for applicable machines fitted with this harness.

Connector Key

LA	Bypass Feed Connector
LB	Solenoid Valve Connector
LC	Solenoid Valve Connector

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Powershift Gearbox

Introduction

The fault finding procedures are given in the form of flow charts. There are a number of charts, each one dedicated to a particular fault. The charts are designed to identify possible causes by performing checks and where applicable, specific tests on the gearbox. Having identified a cause the suggested remedy is given. The charts are designed to identify causes through a process of elimination, starting with the simplest, most easily rectified faults.

* Gearbox faults may be caused by faulty electrical connectors or components as indicated in the fault finding charts. Full explanations of the relevant electrical systems for both 4 speed and 6 speed (Shiftmaster) gearboxes are given in **Electrical Connections**.

Due to the time and effort involved in removing, dismantling, assembling and replacing a gearbox, it is recommended that fault finding procedures are carried out until a fault can be identified with a good degree of certainty.
Full details of the test procedures referred to in the charts are given in **Service Procedures, Powershift Gearbox.**

Fault Finding Charts:

Chart A - Machine drives but lacks power in all gears. Gearbox oil may also be overheating.

Chart B - Machine does not drive in any gear.

Chart C - Some gears fail to engage or lack power. 4WD fails to engage.

Chart D - (6 speed gearbox only) Shiftmaster fails to function normally - fails to autoshift - shifts at incorrect road speed.

Note: 4th, 5th and 6th gears utilise clutches used for 1st, 2nd and 3rd gears. If 4th, 5th or 6th gears fail to engage, check that the lower 3 gears function correctly before investigating a possible Shiftmaster fault. See **Fault Finding Chart C.**

Chart E - Gearbox oil overheats

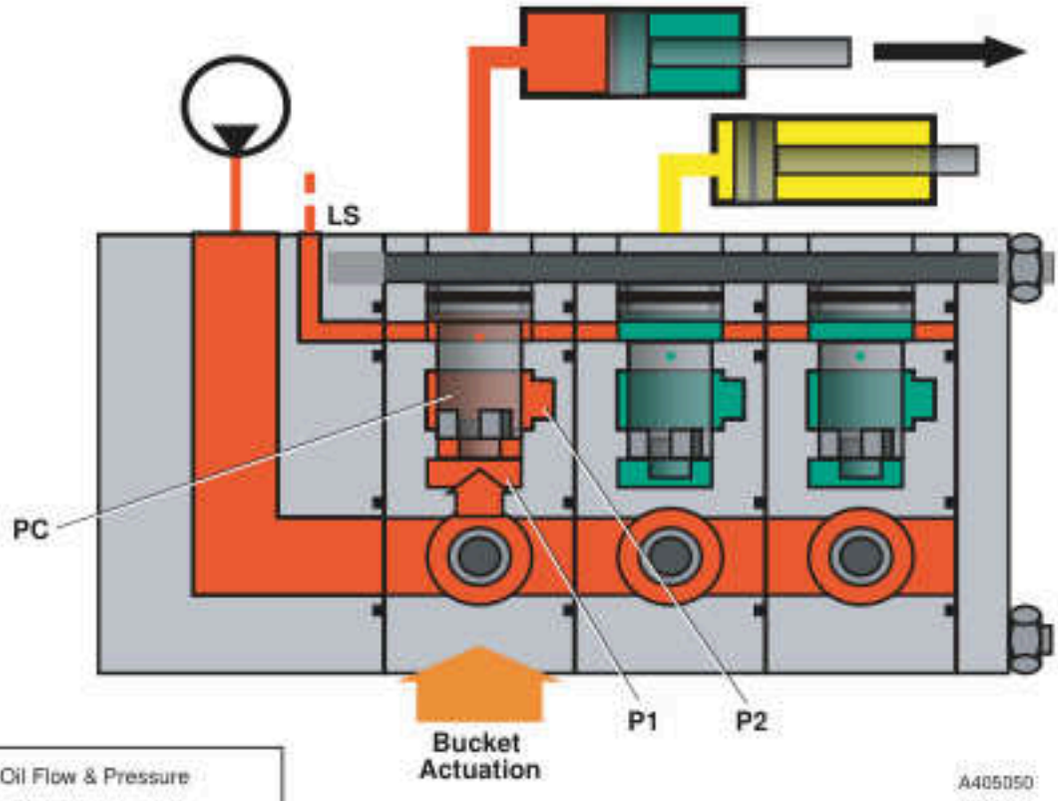
Chart F - External oil leakage

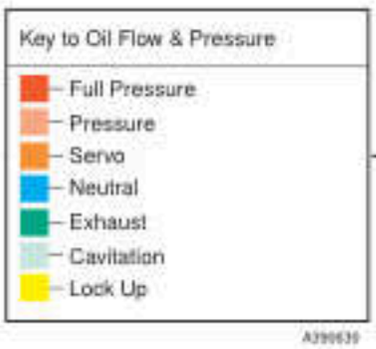
Chart G- Noisy operation

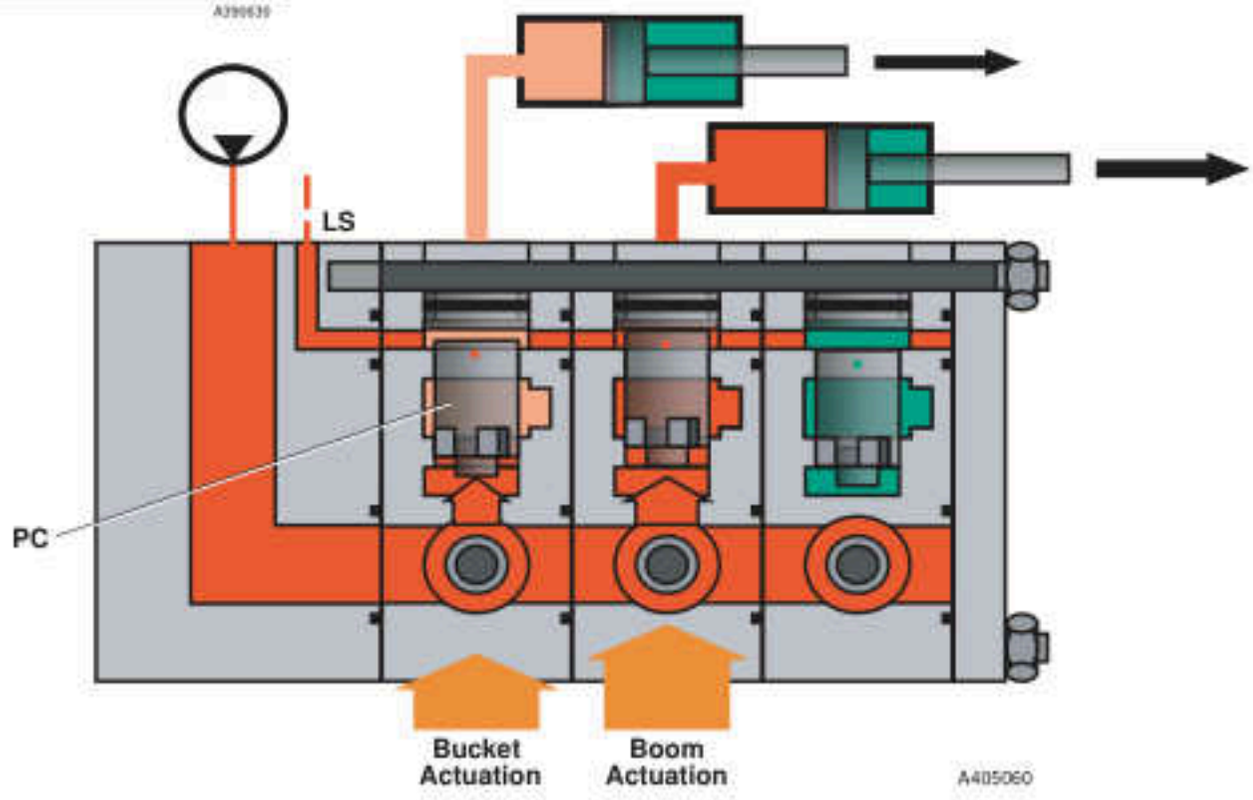
Further Fault Finding Information

Gearbox Oil Contaminated with Water

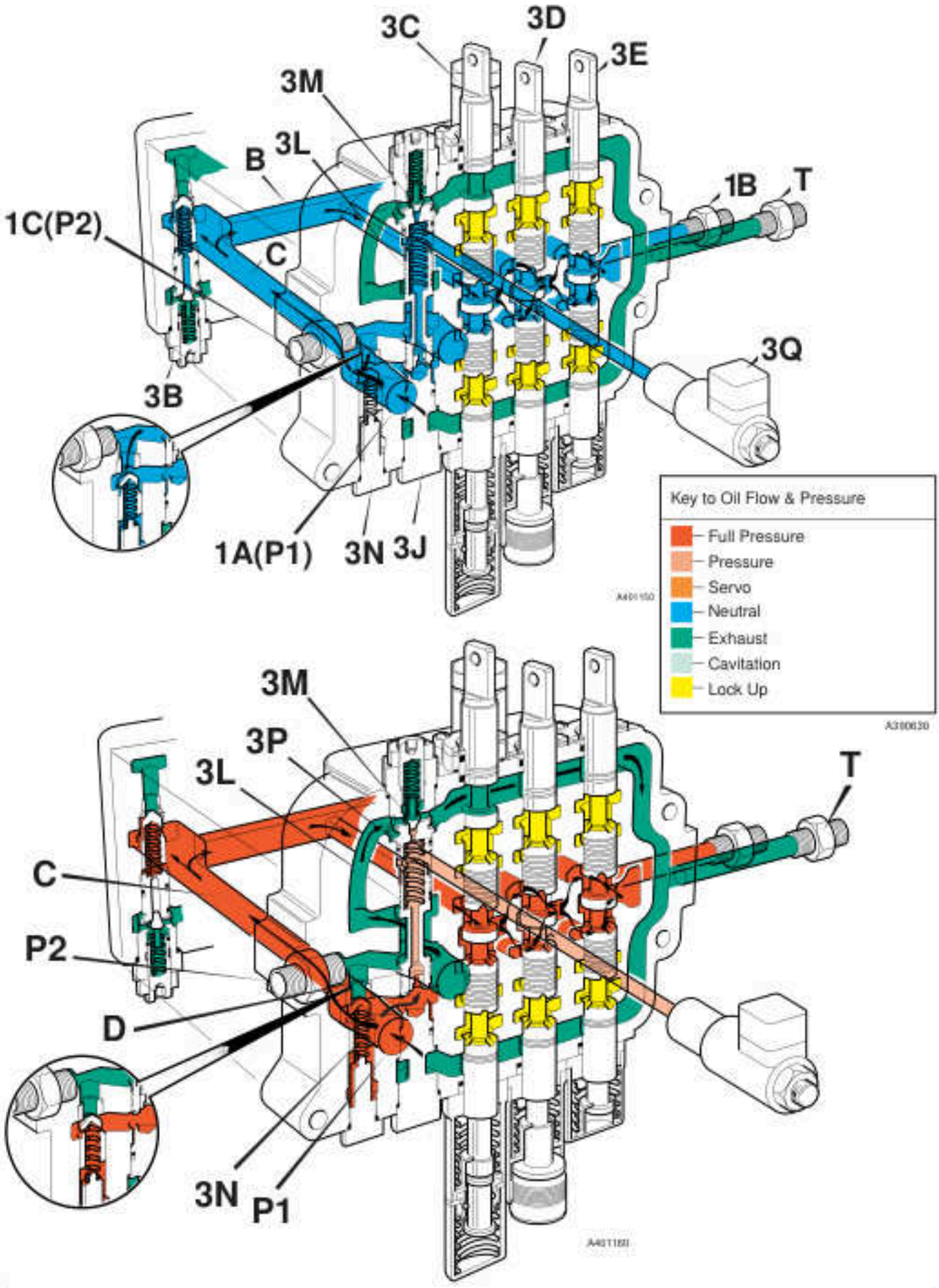
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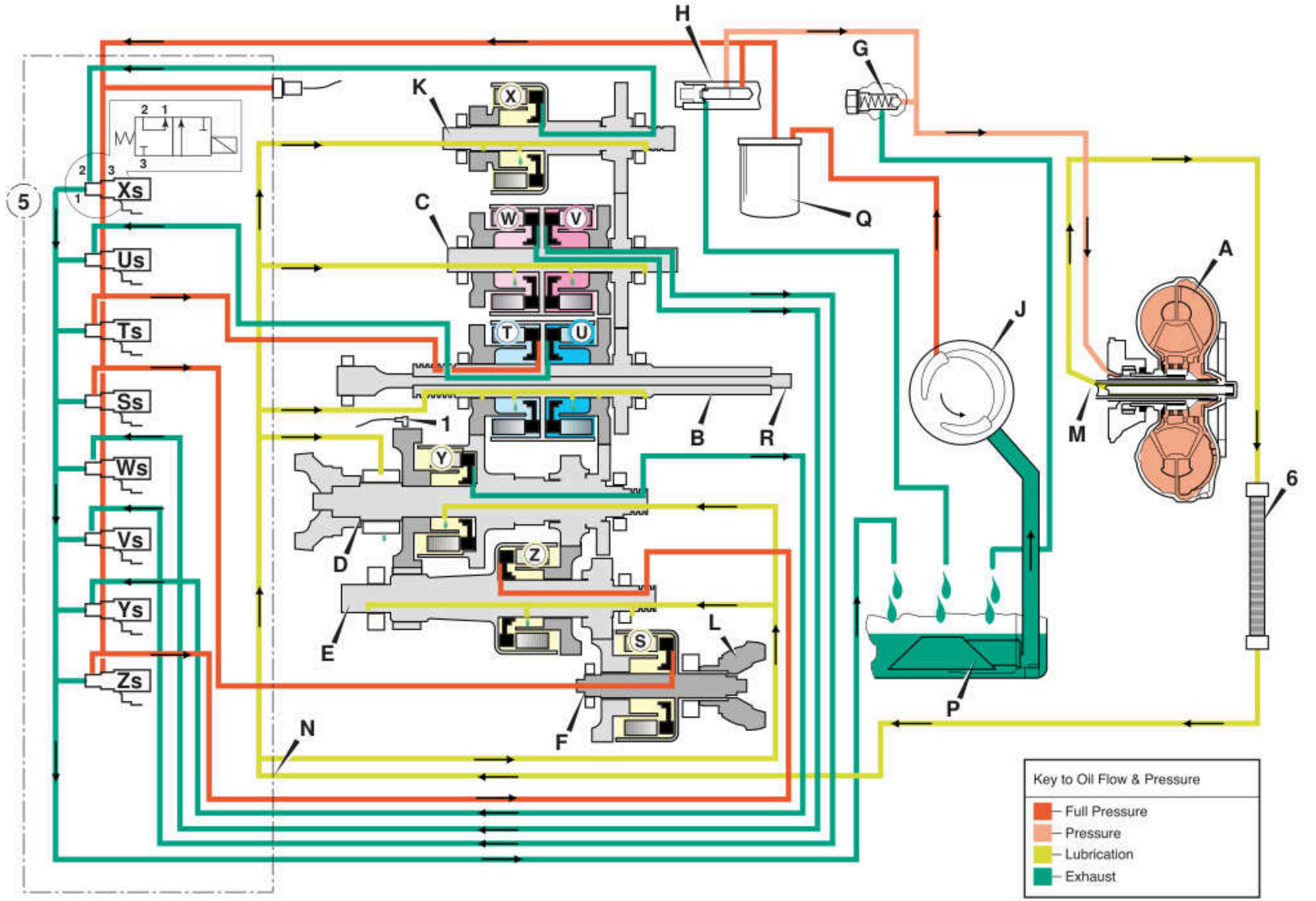




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