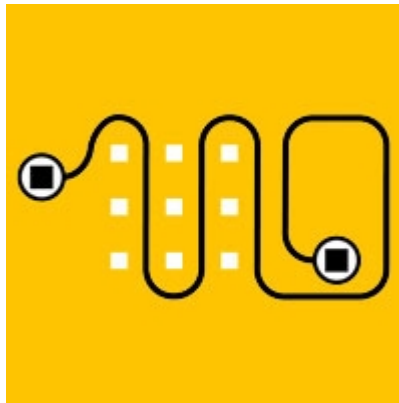


auto steer **5400S**

## Autosteer 5400S Hydraulic Installation Guide



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# 1.0 Introduction

This manual contains information about the hydraulic systems of various machine models. Information may include fitting sizes and quantities, hydraulic schematics and photos of installations.

## Warning !

*This manual is only designed to be a guide, if you are in any doubt on how to fit the Autosteer hydraulic valve, contact Farmscan before commencing installation.*

FARMSCAN/COMPUTRONICS endeavour to keep this information as accurate as possible, but as the manufacturing, assembly, machine options, diagram interpretations and the fitting of valves are out of our control, some information may not be accurate for every situation.

**For machines not included in this manual obtain the manufacturers hydraulic information and contact Farmscan.**

FARMSCAN/COMPUTRONICS accept no liability for any costs incurred from using the hydraulic information contained in this manual. It is the responsibility of the Hydraulic fitter to check the machines technical manuals to ensure the correct selection and installation of hydraulic components.

## 1.1 General information

### Legal Considerations

1. Valve to be installed by a qualified Hydraulics fitter.
2. Use only the correct crimp on fittings.
3. Hydraulic hoses to be cleaned before installation.
4. Test operation of valve before moving the machine.

**Failure to observe these warnings may result in machine damage or personal injury!**

## 1.2 Hydraulic installation Safety Guidelines

- 1 Mount steering valve away from heat sources like exhaust systems
- 2 Mount steering valve in a protected position away from chance of impact.
- 3 Only use the correct fittings types and sizes for the valve manifold and machine that it is to be installed on.
- 4 Use only the correct hydraulic hose for the fittings that are used.
- 5 **DO NOT** make up fittings by cutting and/or welding fittings together.
- 6 Do not allow any hydraulic hoses to rub or chafe against any other hose or part of the machine
- 7 Test the operation of the steering valve left and right prior to field testing.

- 8 Ensure that the steering valve is not affecting the operation of the standard steering and brake system in anyway.
- 9 If any hydraulic leaks are present investigate why. It can be an indicator that a incorrect hose or fitting has been used.
- 10 Ensure that the electrical looms cannot be cut, chafed or damaged in any way. Ensure that they are grometed through any cabin entry point.
- 11 Ensure that the steering system, disables Autosteering as soon as the steering wheel is turned.
- 12 When testing the installation for the first time do so below 10 Km/h but above 2 Km/h.

## 2.0 John Deere 9000 Series 4WD

### 2.1 Description

The 9000 series John Deere 4WD tractors are a standard Pressure/load sense system. The hoses can be installed as per the diagram below.

The valve can be mounted in the articulation point, or on the side of the engine bay, the latter is usually used when the tractor is fitted with the optional PTO.

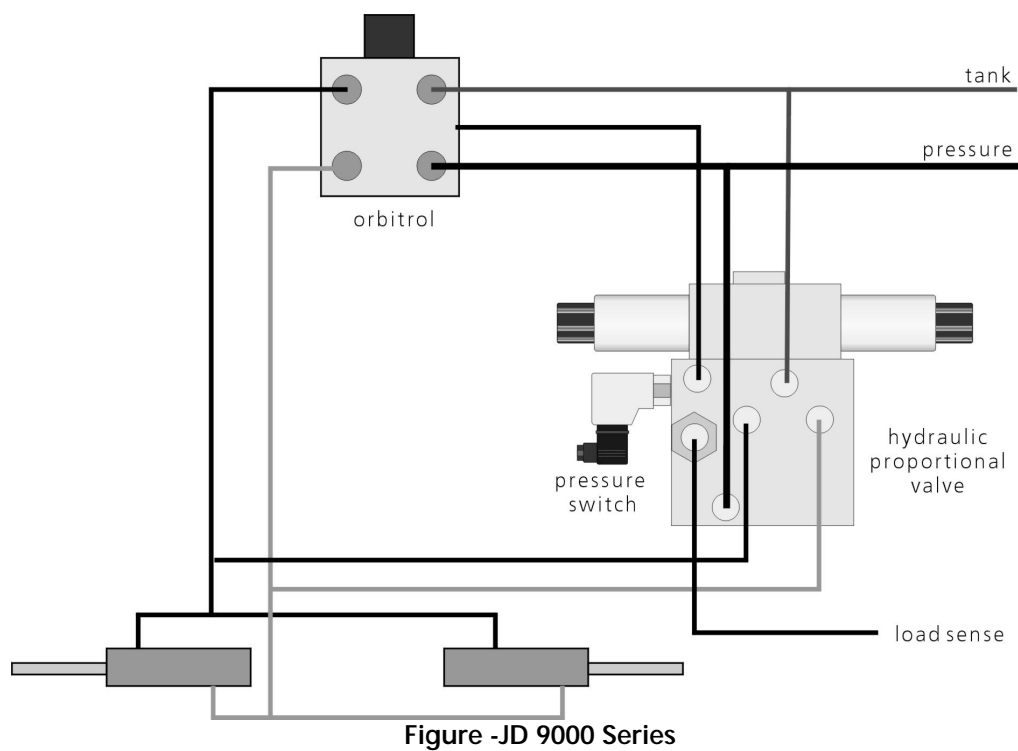
Because the orbitrol is not easy to get to, short hoses are attached to the orbitrol and "Tee's" attached to these. This allows the pressure and tank hoses to be attached. The Left and Right hoses are attached to the steering rams as in Figure 5.

The load sense has to go through the Autosteer Valve. That is take the sense line off the orbitrol and connect it to the PS port, a new hose is connected from the OS port on the Autosteer Valve back to the orbitrol.

***NB: If using a hydromotor, these systems ramp up the hydraulic standby pressure. This will require the hydraulic disable switch to be readjusted to compensate.***



## 2.2 Hydraulic diagram



## 2.3 Fittings Info

## 2.4 Kit Number

5400S/STAND

## 2.5 Illustrations



Figure -Valve mounted in articulation point



Figure - Showing "Tee's" into hoses for pressure and tank



Figure - Another Showing "Tee's" into hoses for pressure and tank



Figure - Teeing into the steering rams

## 3.0 John Deere 8000 Series FWA

### 3.1 Description

The 8000 series FWA utilizes the power beyond kit on the rear of the tractor. Load sense pressure and tank are connected to this kit.

The top of the valve stack has to be removed to install a small shuttle valve under the load sense outlet. This valve stack has to be spotlessly clean prior to removing the top. Be careful that no sections move while removing the top.

The hydraulic disable switch is removed from the valve and the port is plugged. The hydraulic disable switch is installed on a test port on the JD steering valve (Orbitrol) using the adapter in kit (see image).

The left and right hoses from the Autosteer Valve are plumbed into the JD left and right hoses at the front of the cab, on the left hand side using "Tee's".

### 3.2 Hydraulic diagram

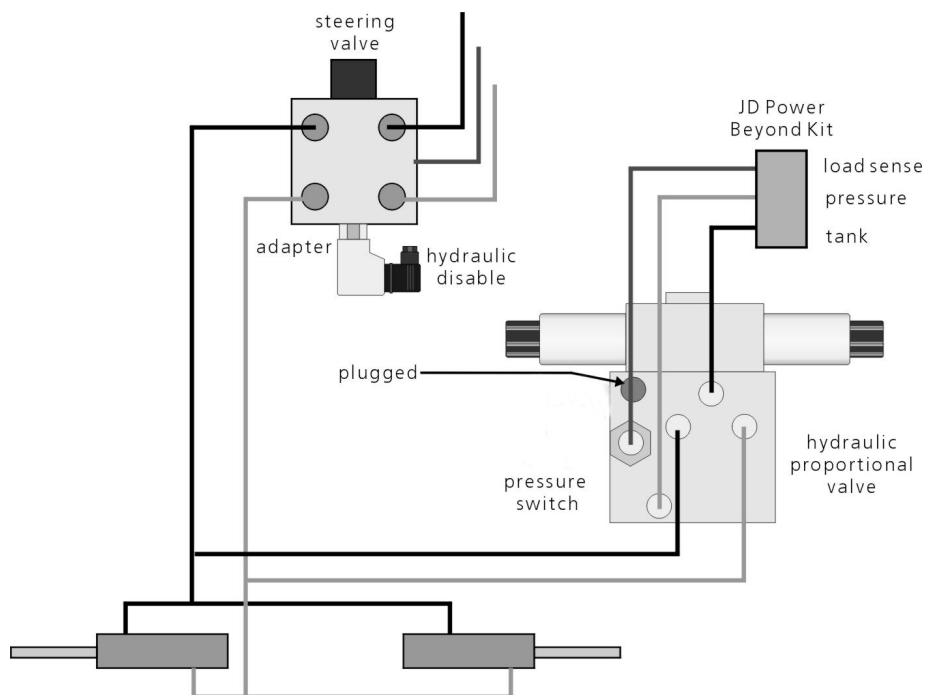


Figure – JD FWA

### 3.3 Fittings Info

### 3.4 Kit Number

5400S/JD8000

### 3.5 Illustrations



Figure – Power beyond stack



Figure – Top plate to valve stack



Figure – Load sense shuttle disk goes here



Figure – Load sense Shuttle Valve



Figure – Load sense Shuttle Valve orientation



Figure – Left and right t's. Just forward of can steps.

## 4.0 John Deere 4700 SP Sprayers

### Warning!

There are 2 different steering systems on this machine depending on the serial number.

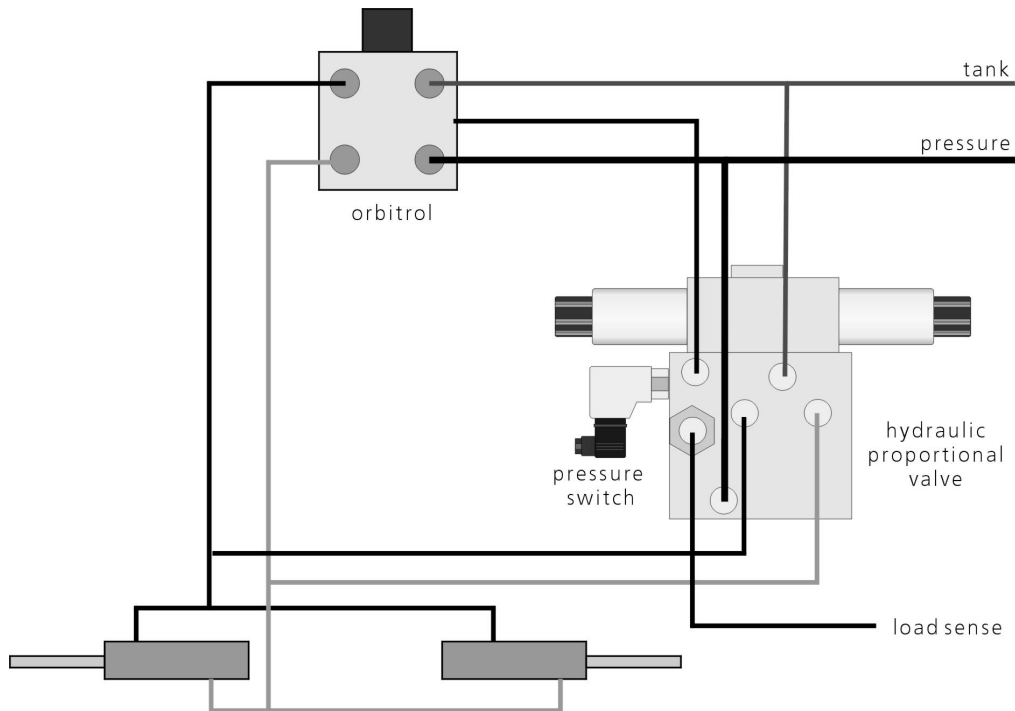
### 4.1 Description System SN < 4001

The John Deere SP sprayers are a pressure/flow compensated system. The Autosteer valve can be plumbed in by "Teeing" into the 4 hoses on the orbitrol. That is the Pressure, Tank, Left, and Right.

The load sense has to go through the Autosteer Valve. That is take the sense line off the orbitrol and connect it to the PS port, a new hose is connected from the OS port on the Autosteer Valve back to the orbitrol.



## 4.2 Hydraulic diagram



## 4.3 Fittings Info

## 4.4 Kit Number

5400S/STAND

## 4.5 Illustrations

## 4.6 Description System SN = > 4001

Left and right steering hoses are self explanatory. It is easier to put the T pieces at the steering rams. Both T's need to go at the rear of the rams. Run the hoses with the existing lines, this will give you enough hose when the wheels are extended out.

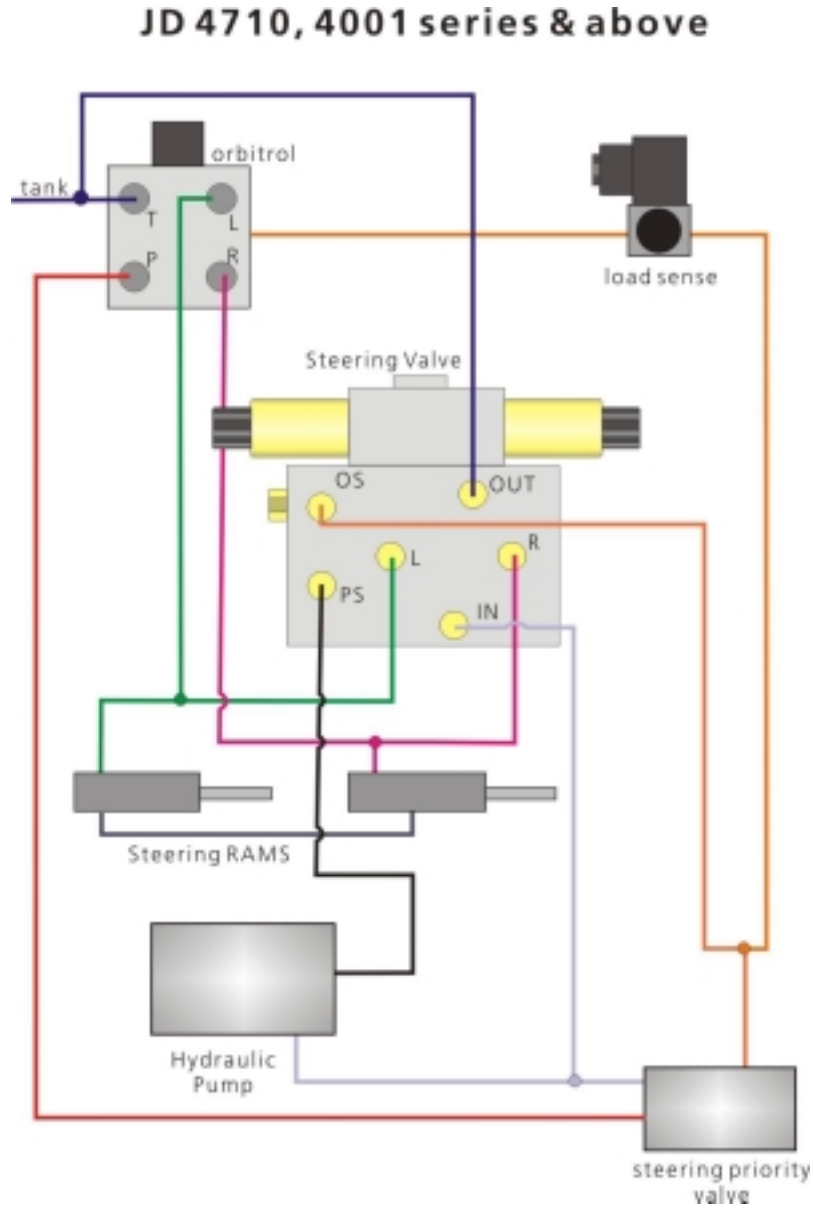
Tee into the orbitrol for the tank return. Consult the machine manual to find the return line.

The pressure line needs to be Tee'd in at the hydraulic pump, where it feeds off the steering priority valve. Find the most convenient point along the pressure line and fit the T-piece.

The load sense line leaving the hydraulic pump needs to be removed. Extend this hose to the OS port on the proportional valve. Run a hose from the PS port on the proportional valve to the hydraulic pump.

The pressure switch needs to be Tee'd into the load sense line between the steering orbitrol and the steering priority valve.

### 4.7 Hydraulic Diagram



## 4.8 Fittings info

### Steering lines

- 2 \* T280-0409 9/16 ORFS Female
- 2 \* S121-090909 9/16 ORFS TEE Piece Male Female Male
- 2 \* T204-0409 9/16 JIC Female
- 1/4" Hose (approx 5 m)
- 2 \* S90-0908 BSP/JIC adaptor

### Pressure Line

- 1 \* S121-111111 11/16 ORFS TEE Piece Male Female Male
- 1 \* T280-0611 11/16 ORFS Female
- 1 \* T204-0609 9/16 JIC Female
- 1 \* S90-0908 BSP/JIC adaptor
- 3/8" Hose (approx 2.5 m)

### Tank Line

- 1 \* S121-111111 11/16 ORFS TEE Piece Male Female Male
- 1 \* T280-0611 11/16 ORFS Female
- 1 \* T204-0609 9/16 JIC Female
- 1 \* S74-0609 BSP/JIC adaptor
- 3/8" Hose (approx 1.5 m)

### Load Sense Lines

- 2 \* T280-0409 9/16 ORFS Female
- 1 \* S116-0909 9/16 ORFS Straight Adaptor
- 2 \* T204-0409 9/16 JIC Female
- 2 \* S90-0907 BSP/JIC adaptor
- 1/4" hose (approx 5 m)

### Pressure Switch Adaptor Hose

- 2 \* T280-0411 11/16 ORFS Female
- 2 \* T201-0404 BSP Male
- 1 \* S29-040404
- 1/4" hose (approx 500 mm)

### Please note:

- All these fittings are quoted from the RYCO catalogue AUS JUNE 02.
- Hose lengths are approximate due to position of Farmscan hydraulic proportional valve on machine.

# 4.9 Illustrations

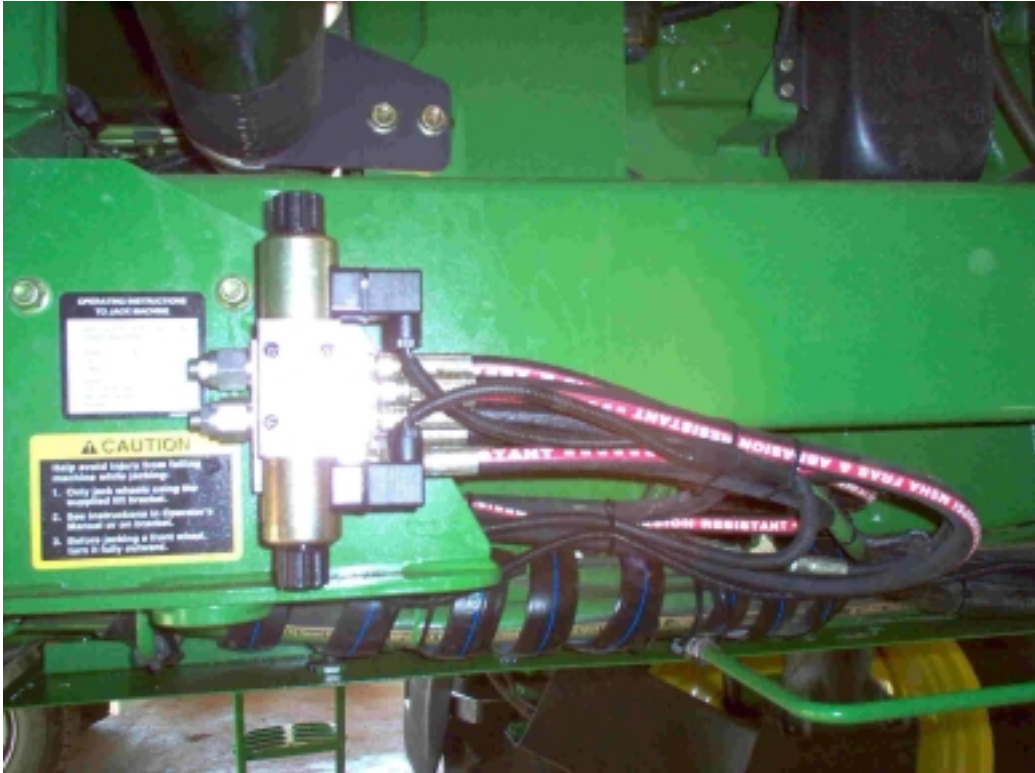


Figure – JD 4700 Valve placement

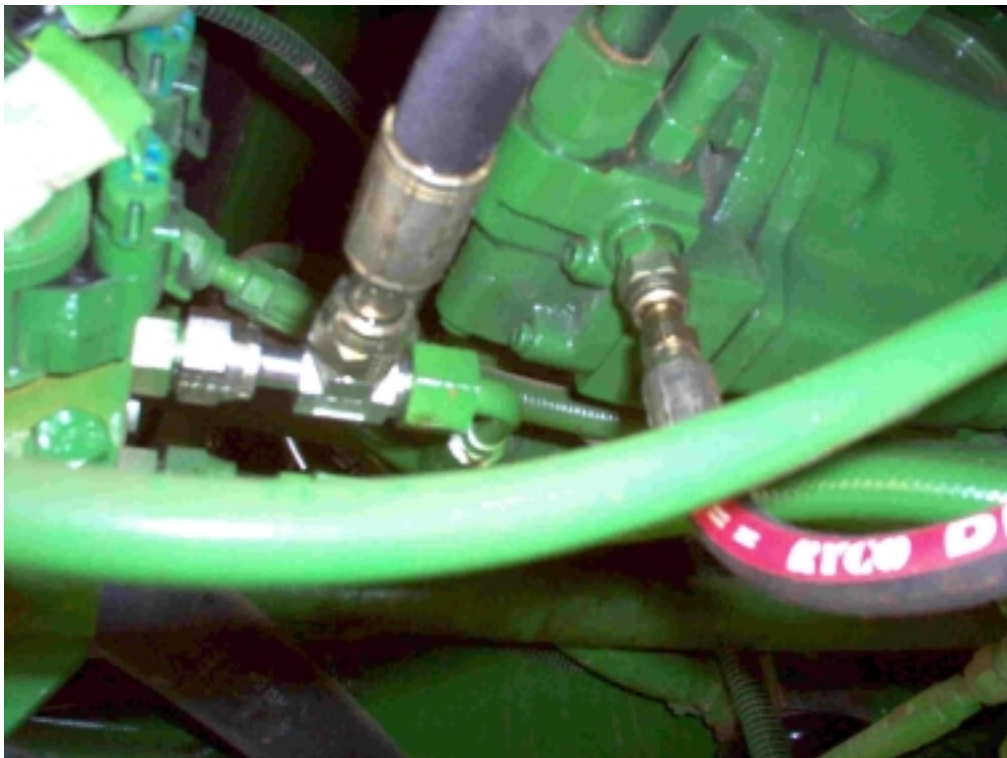


Figure – Load sense and Pressure lines



Figure – Wheel angle sensor installation

## 5.0 John Deere 9000 Series Harvesters

### 5.1 Description

The 9000 series harvesters have a closed centre steering system. You have to use a flow divider valve to supply oil to the steering valve. Failure to plumb this system up correctly can result in pump damage. See the diagram below for plumbing.

**The flow control valve has a pressure relief valve that has to be adjusted to allow enough pressure to pass to actuate the steering rams.**



## 5.4 Kit Number

5400S/STAND/FLOW

## 5.5 Illustrations



Figure – JD 9000 series harvester wheel angle sensor

## 6.0 Case STX 4WD

### 6.1 Description

The Case STX 4WDs are a pressure/flow compensated system. There is ample room around the orbitrol for installation. The Autosteer valve can be plumbed in by "Teeing" into the 4 hoses on the orbitrol. i.e. The Pressure, Tank, Left, and Right.

The load sense has to go through the Autosteer Valve. i.e. Take the sense line off the orbitrol and connect it to the PS port, a new hose is connected from the OS port on the Autosteer Valve back to the orbitrol.

The Left and Right can also be plumbed straight to the steering rams.

### 6.2 Hydraulic diagram

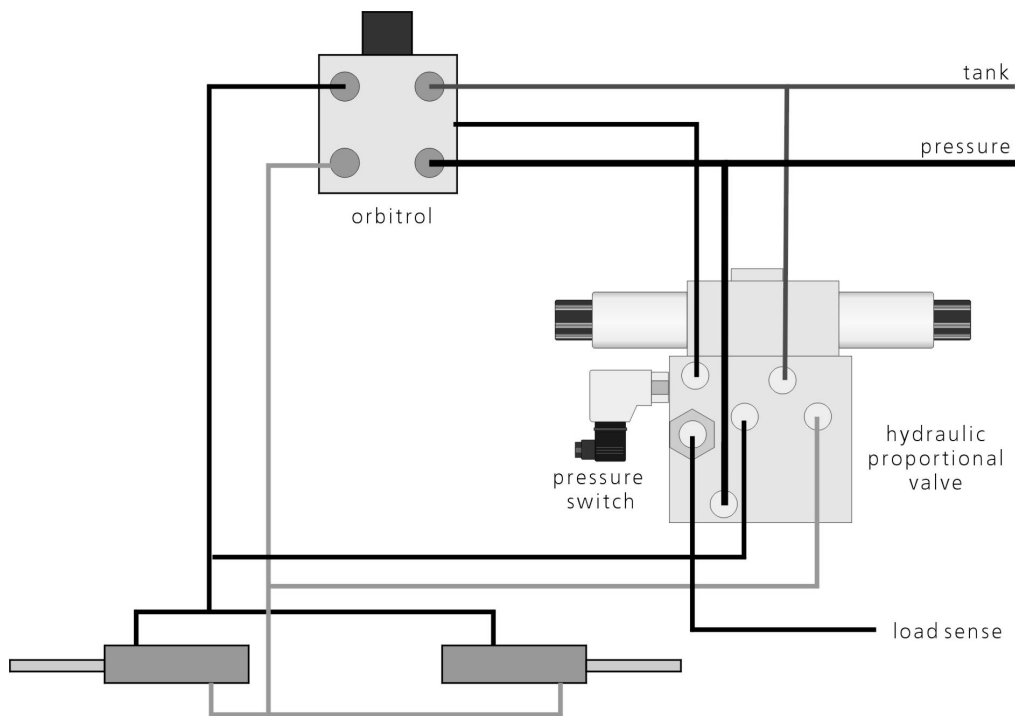


Figure -Case STX 4WD



## 6.3 Fittings Info

Orbitrol fittings

2 X 13/16 O-ring Face for Pressure and Tank

2 X 1-3/16 O-ring Face for left and right Steering Rams

Steering Valve ports

4 X 9/16 UNO Main ports

2 X 7/16 UNO sense line ports

## 6.4 Kit Number

5400S/STAND

## 6.5 Illustrations



Figure – Case STX 4WD

Shows the Autosteer system Tee'd in at the orbitrol. This also shows the valve mounted at the front of the cab just behind orbitrol.



Figure - Valve mounting STX under bonnet



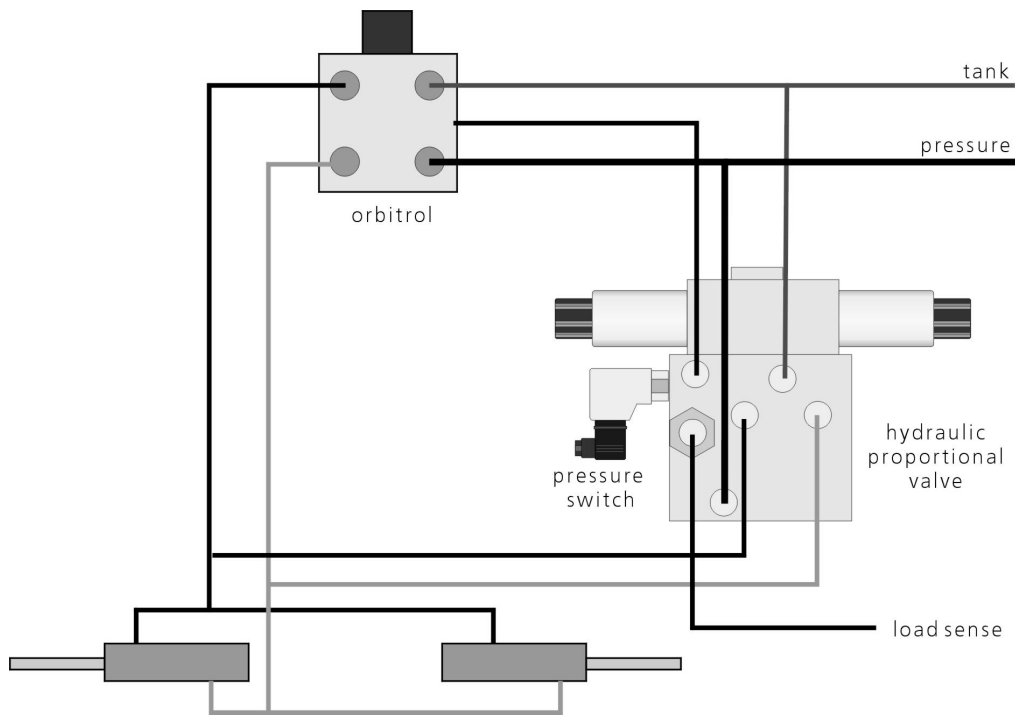
Figure – case Wheel angle sensor

## 7.0 Case MX Series FWA

### 7.1 Description

The Case MX is a standard pressure/flow compensated system. Some of these tractors have the fittings "made onto the hoses on the orbitrol. There is a proprietary quick release coupler. If this is the case you will have to "tee" into the system under the cab.

### 7.2 Hydraulic diagram



### 7.3 Fittings Info

### 7.4 Kit Number

5400S/STAND

### 7.5 Illustrations

## 8.0 Case CVX Series FWA

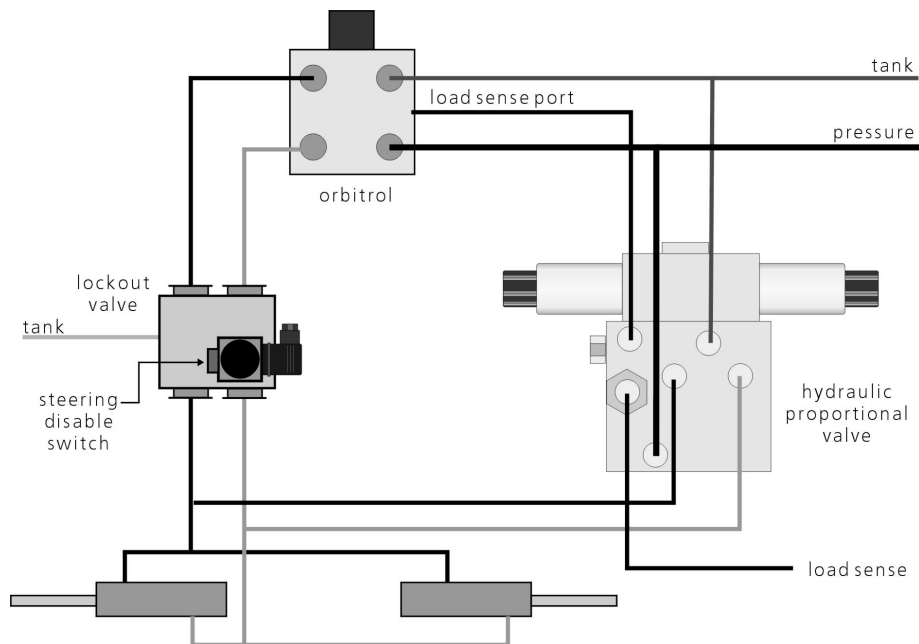
### 8.1 Description

The CVX is a European tractor, and travels faster than 40Km/h. Therefore this tractor has what is called "Reactive Steering". This system allows the wheel to self-centre after cornering, just like a car. If left this way the system will allow oil to pressurize the disable switch when in use, and therefore instantly disable the Autosteer.

A lockout valve is fitted to disable this feature and allow the Autosteer to operate.

Some CVX systems have quick couplers on the orbitrol. If this is the case you will have to tee into the system under the cab.

### 8.2 Hydraulic diagram



### 8.3 Fittings Info

### 8.4 Kit Number

5400S/STAND/LOCK

### 8.5 Illustrations



Figure-Case CVX with lockout Valve



Figure-Case CVX Wheel angle sensor

## 9.0 CASE SPX self propelled sprayer

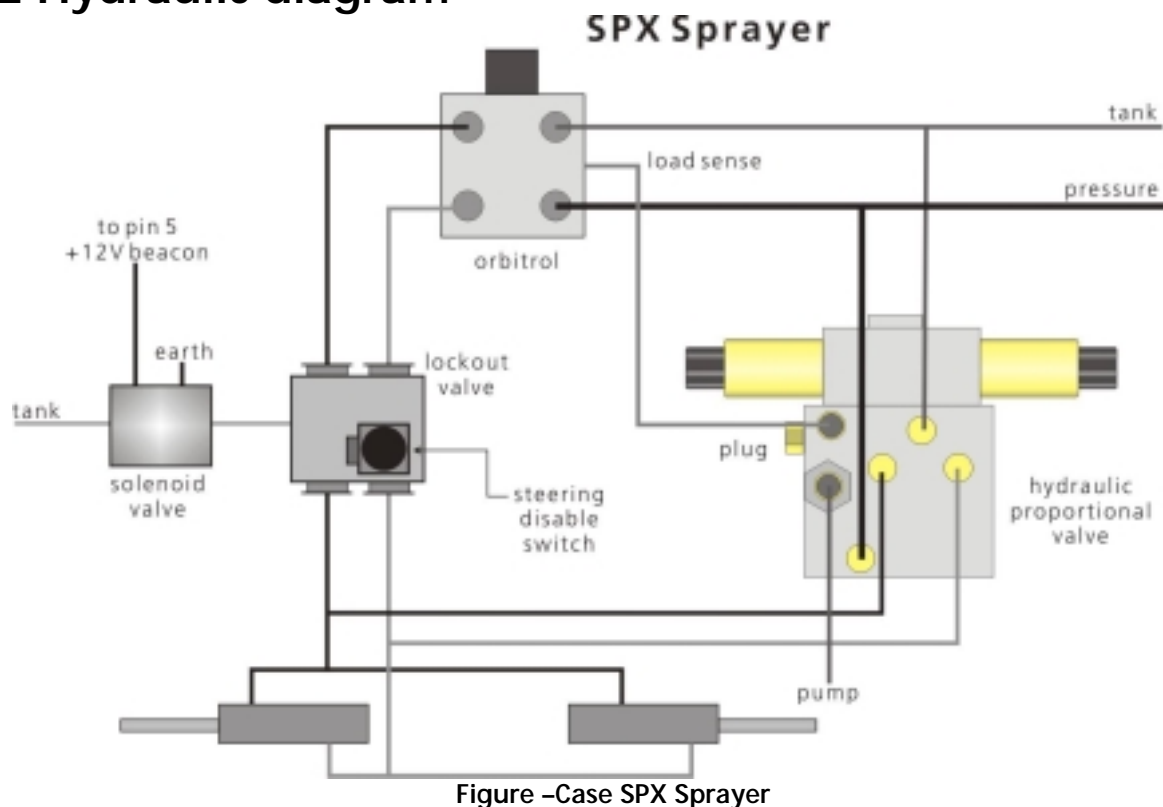
### 9.1 Description

These machines need a lockout valve. They do not have a load sense line.

The two large allen headed adjustment screws have to be turned 1 ½ turns clockwise (tightened).

You have to fit the 12 Volt solenoid valve to the return line from the lockout valve. This 12 volt valve has to be powered from Pin 5 of the steering POD (12 Volt Beacon).

### 9.2 Hydraulic diagram



### 9.3 Fittings Info

### 9.4 Kit Number

5400S/STAND/LOCK/SOL

### 9.5 Illustrations

## 10.0 2300 Series Harvesters

### 10.1 Description

These machines are a standard pressure/flow compensated system. There are easy to work on as it is all under the cab in an easy to get to position.

### 10.2 Hydraulic diagram

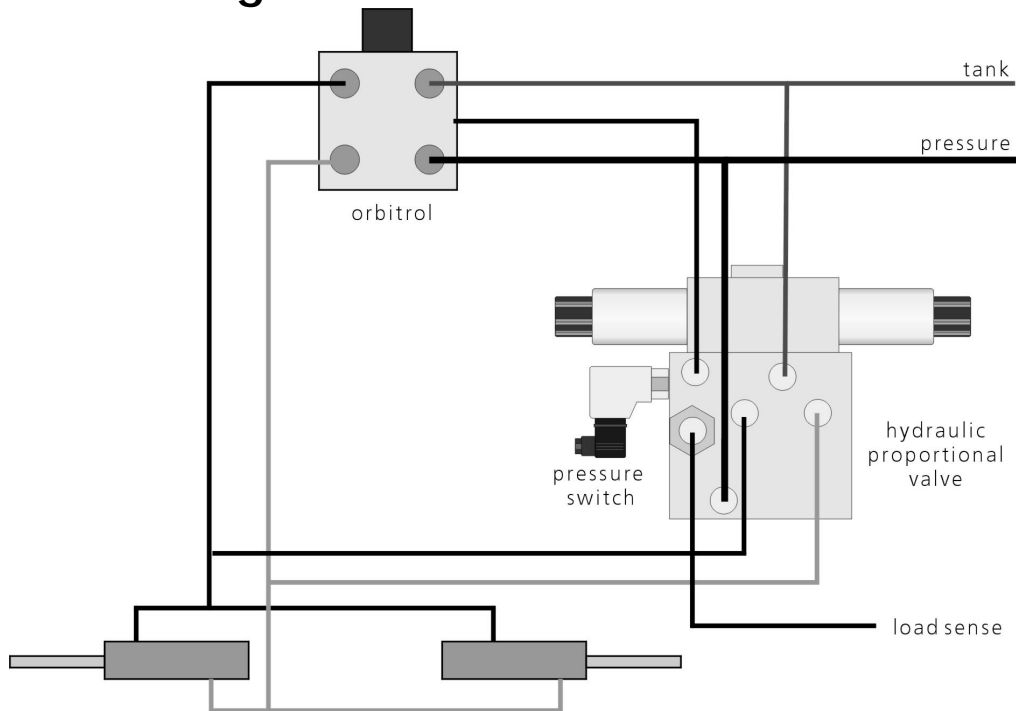


Figure –Case 2300 harvester

### 10.3 Fittings Info

Orbitrol fittings  
 4 X 3/4 JIC for main ports  
 1 X 7/16 for load sense

Steering Valve ports  
 4 X 9/16 UNO Main ports  
 2 X 7/16 UNO sense line ports

### 10.4 Kit Number

5400S/STAND

### 10.5 Illustrations



Figure-Case 2300 series



Figure Case 2300 series Wheel angle sensor



# 11.0 Case AFX Harvesters

Information being gathered.

## 11.1 Description

## 11.2 Hydraulic diagram

## 11.3 Fittings Info

Orbitrol fittings

4 X 13/16 O-ring Face for main ports

1 X 9/16 O-ring Face for load sense

Steering Valve ports

4 X 9/16 UNO Main ports

2 X 7/16 UNO sense line ports

## 11.4 Kit Number

5400S/STAND

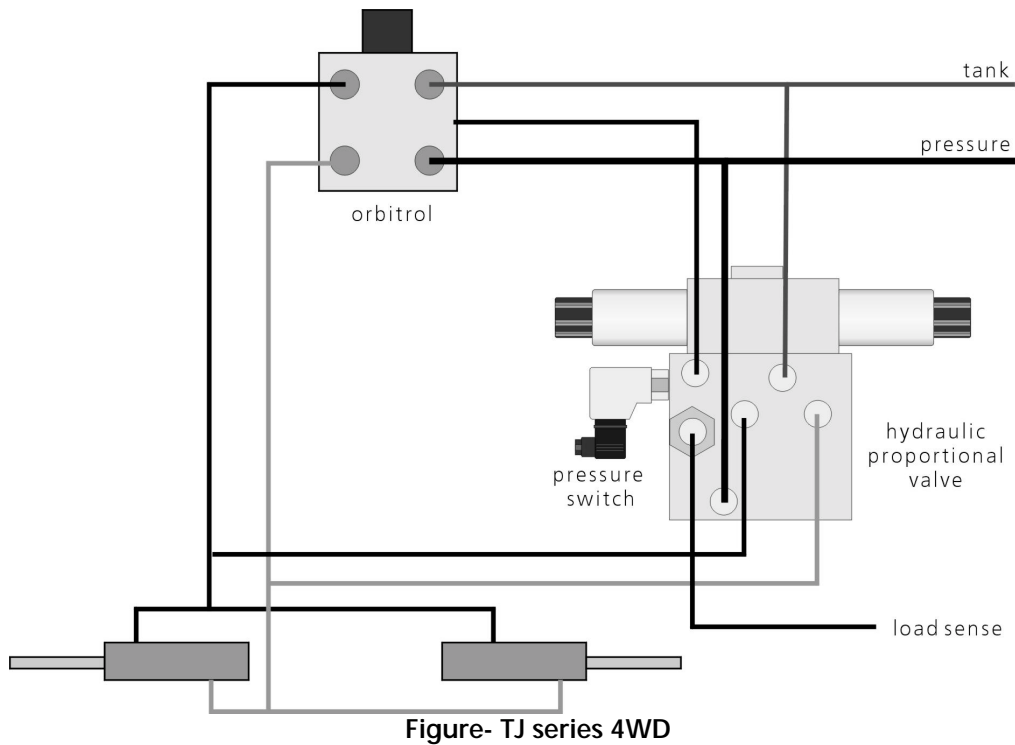
## 11.5 Illustrations

## 12.0 New Holland TJ Series 4WD

### 12.1 Description

These are a standard pressure/flow compensated system. There is ample room in which to work, while installing the 4 Tee's in the system at the orbitrol.

### 12.2 Hydraulic diagram



### 12.3 Fittings Info

Orbitrol fittings

2 X 13/16 O-ring Face for Pressure and Tank

2 X 1-3/16 O-ring Face for left and right Steering Rams

Steering Valve ports

4 X 9/16 UNO Main ports

2 X 7/16 UNO sense line ports

### 12.4 Kit Number

5400S/STAND

## 12.5 Illustrations



Figure-TJ series

## 13.0 New Holland TG Series FWA

### 13.1 Description

### 13.2 Hydraulic diagram

### 13.3 Fittings Info

### 13.4 Illustrations

## 14.0 New Holland TM Series FWA

### 14.1 Description

### 14.2 Hydraulic diagram

### 14.3 Fittings Info

### 14.4 Illustrations

# 15.0 New Holland TR Series Harvesters

## 15.1 Description

The steering system on the TR series harvesters is an open centre system. You have to have an extra flow control valve. There is plenty of room to access the orbitrol valve. The fittings are all JIC (See fittings Info)

The flow control valve has a pressure relief valve that has to be adjusted to allow enough pressure to pass to actuate the steering rams.

## 15.2 Hydraulic diagram

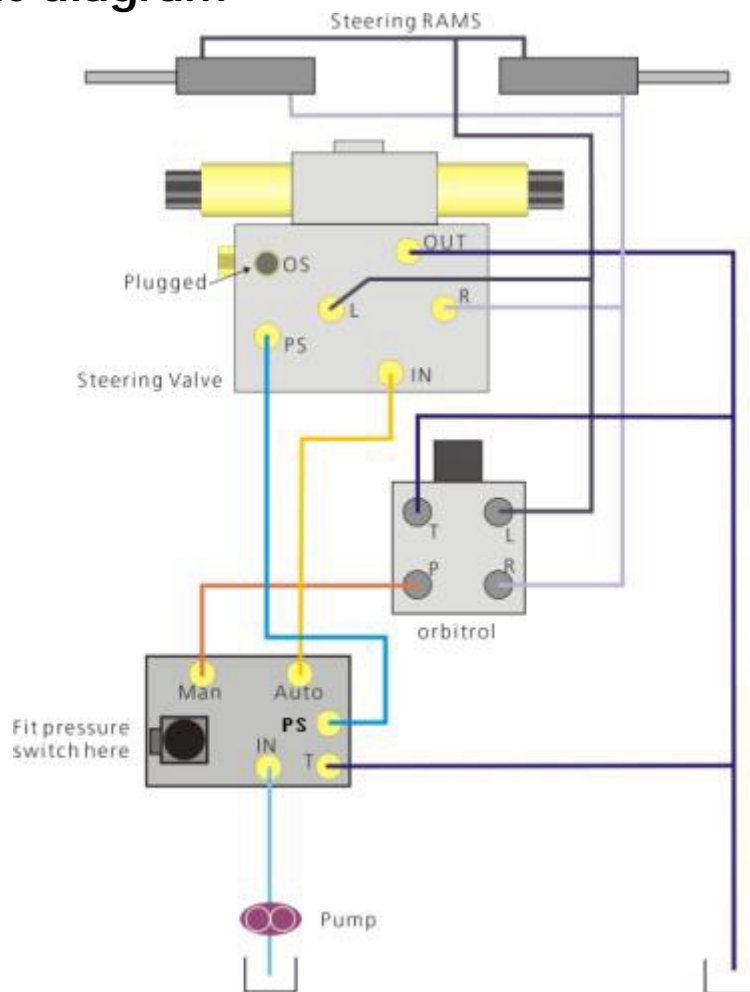


Figure-New Holland TR

## 15.3 Fittings Info

Orbitrol fittings  
4 X 9/16 JIC

Steering Valve ports  
4 X 9/16 UNO Main ports  
2 X 7/16 UNO sense line ports

Flow control valve  
4 X 1/2 BSPP Main ports  
1 X 1/4 BSPP sense line port

## 15.4 Kit Number

5400S/STAND/LOCK

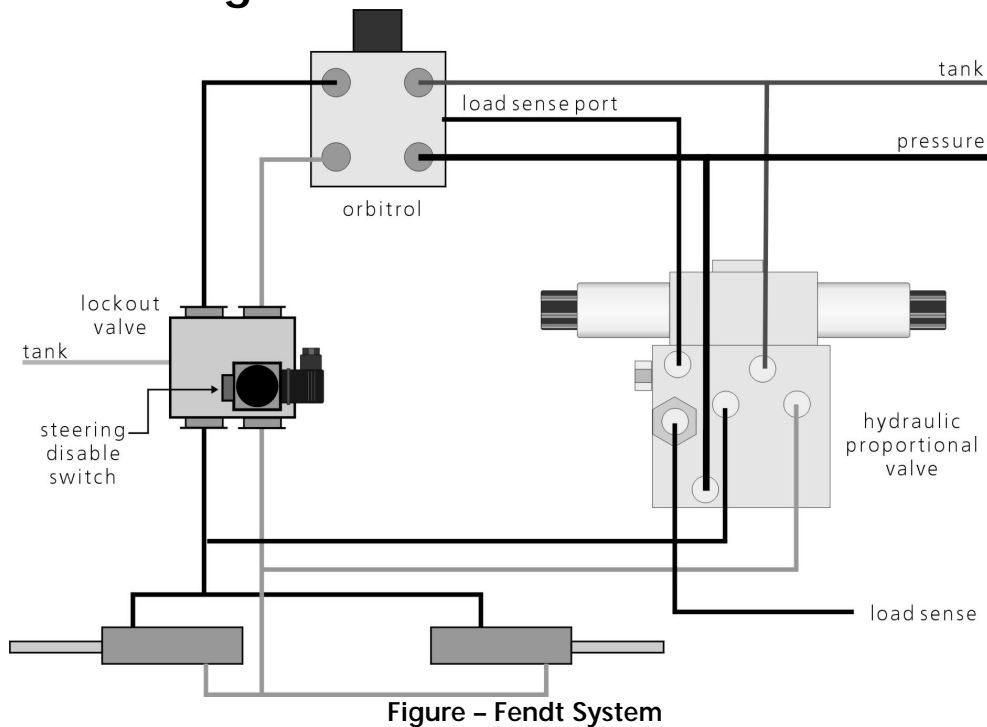
## 15.5 Illustrations

## 16.0 Fendt 900 Series

### 16.1 Description

The Fendt system is a reactive steering system, much like the CVX ase system. You have to use a lock-out valve to disable the reactive steering otherwise the system will immediately get disabled as soon as you hit the Autosteer button.

### 16.2 Hydraulic diagram



### 16.3 Fittings Info

German metric

Pressure, Return, Left and Right 22 mm Metric fittings, 15mm steel pipe.  
Load Sense 14mm fittings 8mm steel pipe

### 16.4 Kit Number

5400S/STAND/LOCK

## 16.5 Illustrations



Figure-Pressure and flow from under tractor



Figure - Left and right to the lockout valve



Figure- Steering and lockout valve in behind tractor hydraulics cover. RHS of tractor



Figure- Load sense

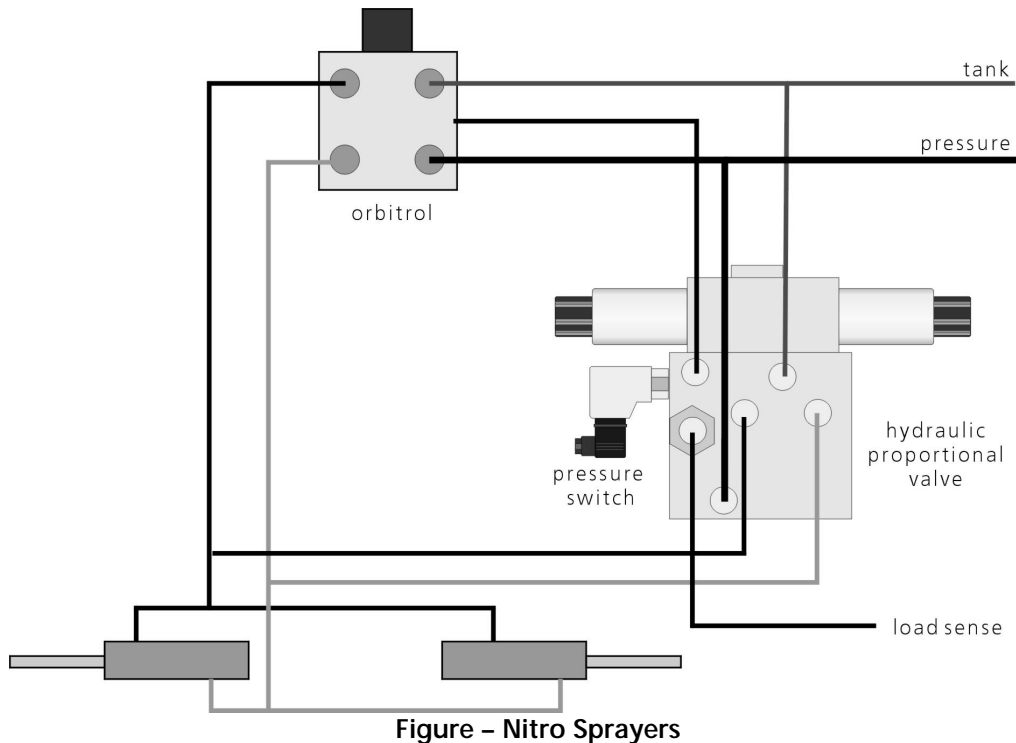


## 17.0 Nitro SP Sprayers

### 17.1 Description

The Nitro Sprayers are a standard pressure/flow compensated system. The orbitrol has easy access from the underneath the machine. "Tee" into the 4 hoses at the orbitrol, pressure, tank, left and right.

### 17.2 Hydraulic diagram



### 17.3 Fittings Info

### 17.4 Kit Number

5400S/STAND

## 17.5 Illustrations



Figure - Nitro Orbitrol



Figure - Nitro Valve position



Figure – Nitro Wheel angle sensor placement

## 18.0 Hardi Alpha

### Warning!

The Hardi Alpha hydraulic system varies with every machine. The following info may not be correct. Check with Hardi before you commence install.

### 18.1 Description

The Hardi Alpha is a dynamic load sense system. This means that the load sense works in the reverse direction of what we call the standard load sense system.

On the Hardi system the load sense is removed from the orbitrol and connected to the OS port on the steering valve, the PS port on the valve is connected to the orbitrol. The hydraulic disable switch is "Tee'd" into the line from the PS port to the orbitrol. The disable switch port on the steering valve is the plugged.

**The flow control valve has a pressure relief valve that has to be adjusted to allow enough pressure to pass to actuate the steering rams.**



## 19.0 AGCO Gleaner harvesters

### 19.1 Description

The Gleaner steering system is a pressure flow compensated system but it needs a flow divider. The Orbitrol is easy to get to under the cab. One of the lines into the orbitrol is a different size; this is so the pressure and return cannot be reversed.

### 19.2 Hydraulic diagram

Figure – Gleaner Harvester

### 19.3 Fittings Info

Orbitrol fittings

3 X 9/16 JIC

1 X 3/4 JIC

Sense line

1 X 7/16 JIC

Steering Valve ports

4 X 9/16 UNO Main ports

1 X 7/16 UNO sense line ports

Flow control valve

4 X 1/2 BSPP Main ports

1 X 1/4 BSPP sense line port

### 19.4 Kit Number

5400S/STAND/FLOW

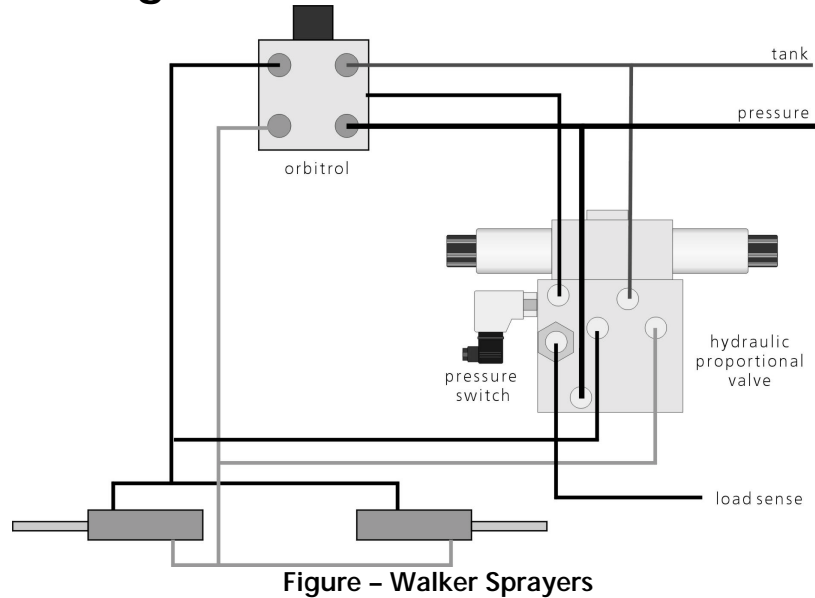
### 19.5 Illustrations

## 20.0 Walker Sprayers

### 20.1 Description

The Walker Sprayers are a standard Pressure/Flow compensated system. The orbitrol has easy access from under the machine. "Tee" into the 4 hoses on the orbitrol, Pressure, Tank, Left and Right.

### 20.2 Hydraulic diagram



### 20.3 Fittings Info

### 20.4 Kit Number

5400S/STAND

### 20.5 Illustrations

## 21.0 JCB Tractors

### 21.1 Description

The JCB steering system is like a truck or car, it has a direct link from the steering wheel to the steering box. With this system we have to mechanically turn the steering shaft. This is done by using the JCB steering hardware. This hardware kit will contain all the hydraulic and mechanical parts needed to Autosteer a JCB.

### 21.2 Hydraulic diagram

These instructions are contained in the hardware kit.

### 21.3 Fittings Info

No fittings are needed. All should be contained in the kit.

## 21.4 Illustrations



Figure- JCB steering hardware



Figure- JCB actuation chain



## 22.0 John Deere 7000/20 Series FWA

### 22.1 Description

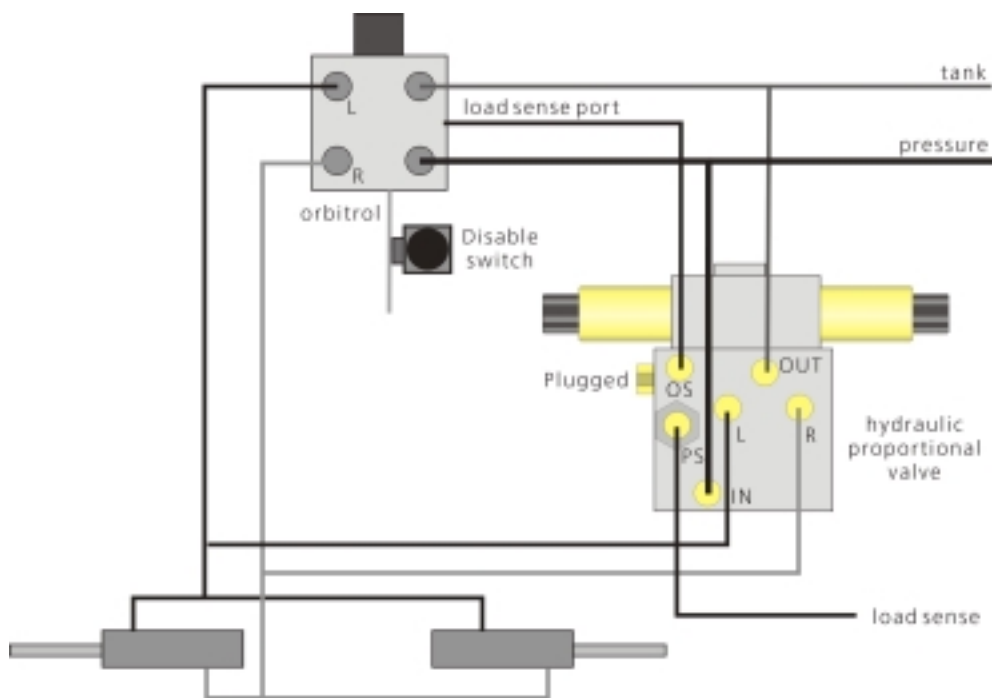
The 7000/20 Series is different to the first 7000 series JD's to be released. To tap into the system you use 4 "Tees" on the pipes that connect to the steering valve. See illustrations.

Remove the cover on the left-hand side, close to the cab to gain access to the steering valve. The disable switch is taken out of the valve and connects into the load sense line.

Remove the exhaust heat cover on the right hand side close to the cab to gain access. See illustrations.

The load sense is spliced into the system at the rear of the machine between the cab and the "Power Beyond Kit" See illustrations.

### 22.2 Hydraulic diagram



### 22.3 Fittings Info

### 22.4 Kit Number

5400S/STAND

## 22.5 Illustrations



Figure – Tees into system at steering valve



Figure – Tees into system at steering valve



Figure - Load sense between cab and power beyond



Figure - Disable pressure switch



Figure - Pressure switch location



Figure - Wheel angle sensor location

## 23.0 New Holland CR Series Harvesters

Information being gathered

### 23.1 Description

### 23.2 Hydraulic diagram

### 23.3 Fittings Info

Orbitrol fittings

Steering Valve ports

### 23.4 Kit Number

### 23.4 Illustrations



Figure – CR series harvester



Figure – CR series harvester

## 24.0 Massey Ferguson harvesters

### 24.1 Description

The Massey Ferguson steering system is a pressure flow compensated system but it needs a flow divider. The Orbitrol is easy to get to under the cab. One of the lines into the orbitrol is a different size; this is so the pressure and return cannot be reversed.

### 24.2 Hydraulic diagram

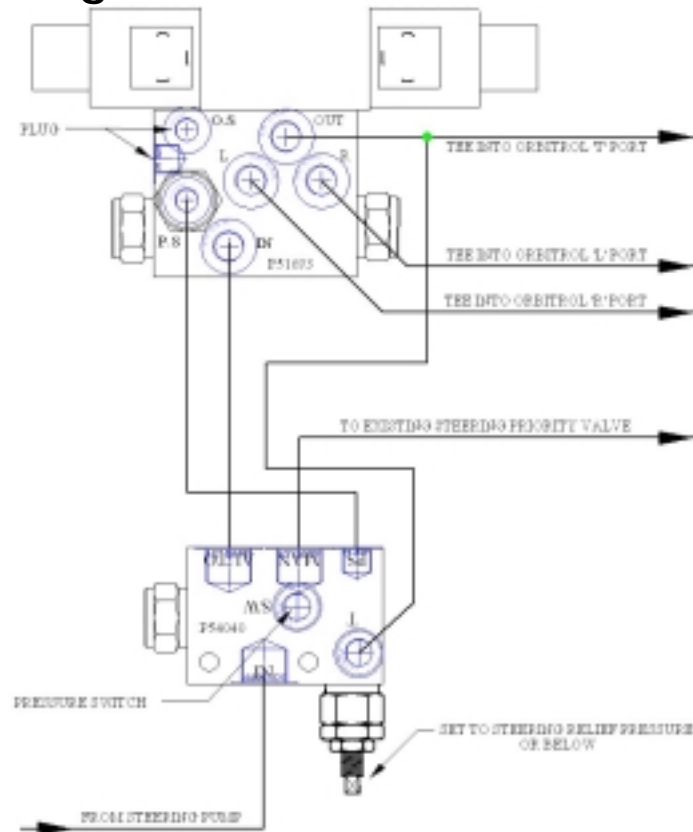


Figure - Massey Harvester

### 24.3 Fittings Info

### 24.4 Kit Number

5400S/STAND/FLOW

### 24.5 Illustrations

# 25.0 Agco Star 4WD tractor

## 25.1 Description

The Agco star system uses a gear pump for the steering system. This means we have to use a flow divider valve in the system.

The pressure switch can be placed in 2 different locations in the system. This is explained on the hydraulic diagram.

## 25.2 Hydraulic diagram

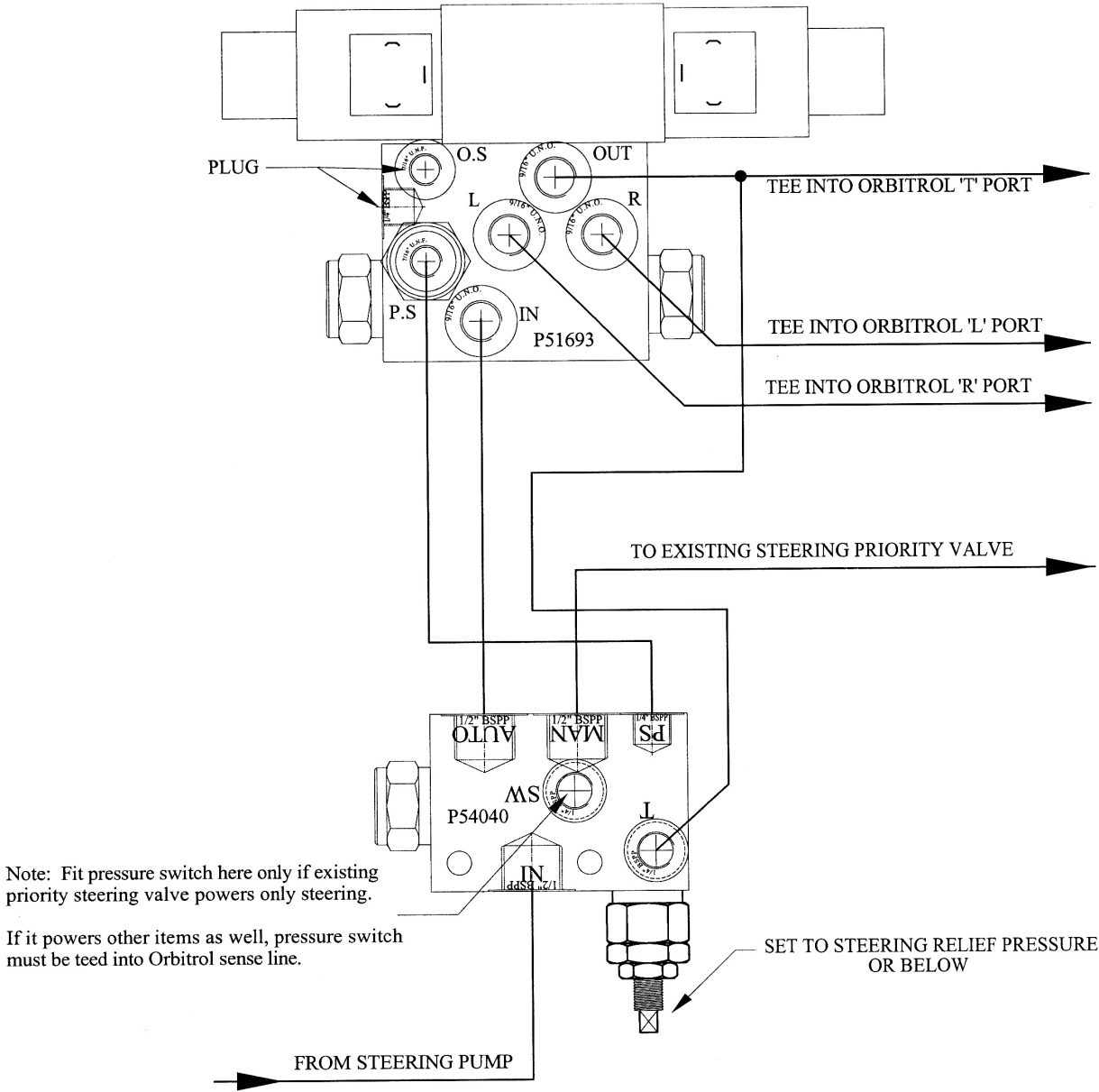


Figure - AGCO Star

## 25.3 Fittings Info

## 25.4 Kit Number

5400S/STAND/FLOW

## 25.5 Illustrations

## 26 Safety and training

1. Ensure that only trained hydraulics fitters fit the hydraulic components.
2. Ensure that all safety and information decals are fitted and visible.
3. Ensure that all people who will be operating the machine have been adequately trained.
4. Only trained operators are to operate the machine.
5. When transporting the machine ensure that the emergency over-ride button is pressed in and that the red indicator light has gone out.

## 27 Support

For any enquiries regarding the performance of your Guidance System please contact:

### Farmscan Service Centre

Phone 08 9470 1177

A/H you will be directed to a service staff member

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