



**Power Beyond
Connections
for
Great Plains 3PYP Planters
Equipped With Hydraulic Steering**

**This Guide Contains
Information For Connecting
Great Plains 3PYP Planters
Equipped With Hydraulic Steering
to Power Beyond Hydraulics on
John Deere,
Case IH, New Holland,
Massey, AGCO, Challenger, & Fendt
Tractors**



Current revisions of this Power Beyond Connections for 3PYP Planters Equipped With Hydraulic Steering are posted on the Great Plains Mfg public website under:

www.greatplainsmfg.com/support/servicedocuments.html

and

www.greatplainsmfg.com/manuals/plantermanuals.html

Make sure you are using the most current revision of the guide. The date of the revision is shown at the bottom of each page.

Explanation

The purpose of this guide is to show the port locations for connecting Great Plains 3PYP planter fan motor to case drain & motor return and steering hydraulics to tractor power beyond hydraulic connections. The information obtained for this guide was taken directly from the tractor manufacturer's information that is available on-line and through tractor dealers.

Since tractor equipment and options vary, the connections shown in this guide must be verified through the tractor manufacturer or dealer to prevent damage to the tractor and implement hydraulic systems.

Great Plains continuous flow fan motors require case drain and motor return lines to protect the motor during use. The case drain line must be connected first, then connect motor return line before connecting the fan pressure line. Failure to do so can cause damage to the motor seals. When disconnecting, always disconnect fan pressure, then motor return, and case drain last.

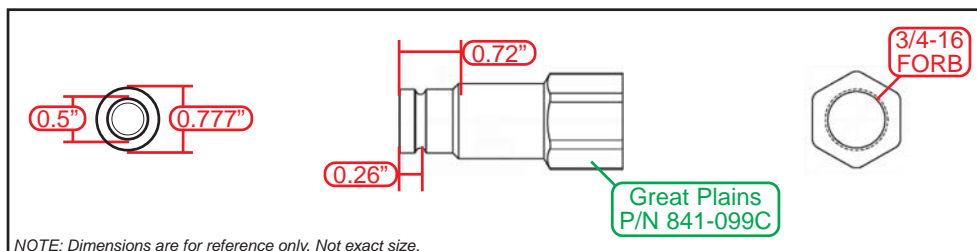
ALWAYS Connect
Case Drain First
Motor Return Second
Fan Pressure Last

ALWAYS Disconnect
Fan Pressure First
Motor Return Second
Case Drain Last

Power beyond pressure and load sense connections are also required for Great Plains 3PYP planters equipped with hydraulic steering. The power beyond pressure connection supplies flow when required for the steering circuit. The load sense line determines when and how much flow is required for the steering circuit. When no flow is required, (i.e. when driving straight or above speed of 8 mph), the system goes into low pressure stand-by mode to reduce hydraulic heating and lessen tractor horsepower draw. The tractor must be turned off before making these connections.

Case Drain

This connection is required to carry the fan motor case internal leakage and steering pilot return flow directly to the tractor hydraulic reservoir (sump) with zero pressure. The case drain oil serves to lubricate and cool motor components not directly exposed to the working oil. Great Plains supplies a 3/8" body size ISO 16028 zero pressure flat face case drain male coupler on a 1/4" hydraulic hose for the fan/steering case drain line. It is normal to have seepage from this fitting when disconnected from the tractor to protect the motor seals from thermal expansion. If the tractor is not equipped with a female flat face case drain coupler, then it must be sourced through a tractor dealer or hydraulic supplier.

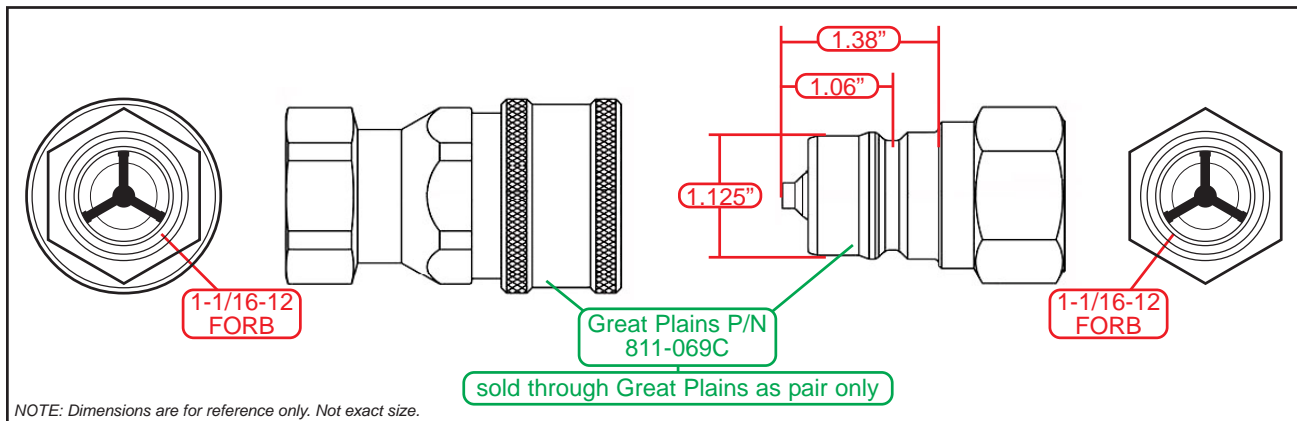


Explanation - Continued

Motor Return

This connection is required to carry the low pressure return oil from the fan motor and steering valve return flow to the hydraulic reservoir or charge circuit. Using a motor return port prevents accidental reverse operation and possible flow checking of the return SCV coupling. Great Plains supplies a 3/4" body size ISO 7241-1 Series A male and female coupler with each 3PYP planter. The male coupler is installed on the 1/2" return hydraulic hose from the factory. The mating female coupler must be connected to the tractor motor return port. The motor return hose and couplers are large to reduce back pressure to the motor.

NOTE: Fan Motor/Steering Return and Steering Power Beyond Pressure have the same size couplers. DO NOT confuse these two connections or damage to the fan motor will occur.



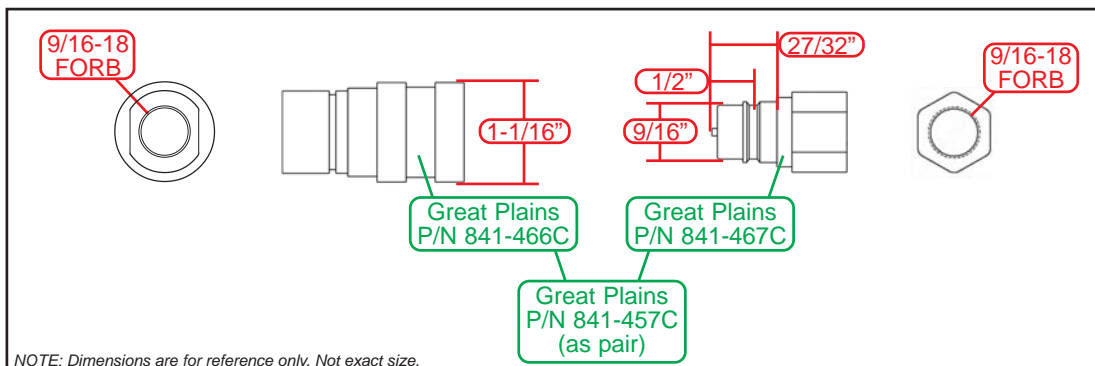
Power Beyond Pressure

This connection is required to supply flow to the steering circuit. Great Plains supplies a 3/4" body size ISO 7241-1 Series A male and female coupler with each 3PYP planter. The male coupler is installed on the 1/2" power beyond pressure hydraulic hose from the factory. The mating female coupler must be connected to the tractor power beyond pressure port. The tractor must be turned off before making this connection.

NOTE: Fan Motor/Steering Return and Steering Power Beyond Pressure have the same size couplers. DO NOT confuse these two connections or damage to the fan motor will occur.

Load Sense

The load sense line signals the tractor hydraulic pump when flow is required for the power beyond pressure. Great Plains supplies a 1/4" body size male and female coupler with each 3PYP planter. The male coupler is installed on the 1/4" load sense hydraulic hose from the factory. The mating female coupler must be connected to the tractor load sense port. The tractor must be turned off before making this connection.



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Tractor Requirements

Tractors connected to 3PYP planters must meet each of the following requirements:

1. LS Closed or PC Closed hydraulic systems with power beyond connections which include case drain, motor return, power beyond pressure, and load sense. Open Center hydraulic systems **MUST NOT** be used.

NOTE: *Load sense is not required with PC Closed hydraulic systems and the load sense line on the planter steering manifold must be removed and the port plugged. See Removing Planter Steering Manifold Load Sense Line in this guide.*

2. Three point hitch with minimum lift capacity of 16,000 pounds.
3. Minimum 220 drawbar Hp.
4. Capability of minimum 13,000 pounds at the front wheels.

Verify the specifications of the tractor with a tractor dealer. Articulated tractors are not compatible with 3PYP planters equipped with steering.

Tractors Equipped with PC Close Hydraulic Systems

Tractors with PC Closed hydraulic systems will not have a load sense connection. The load sense line on the planter steering manifold must be removed and the port must be plugged. See *Removing Planter Steering Manifold Load Sense Line* in this guide.

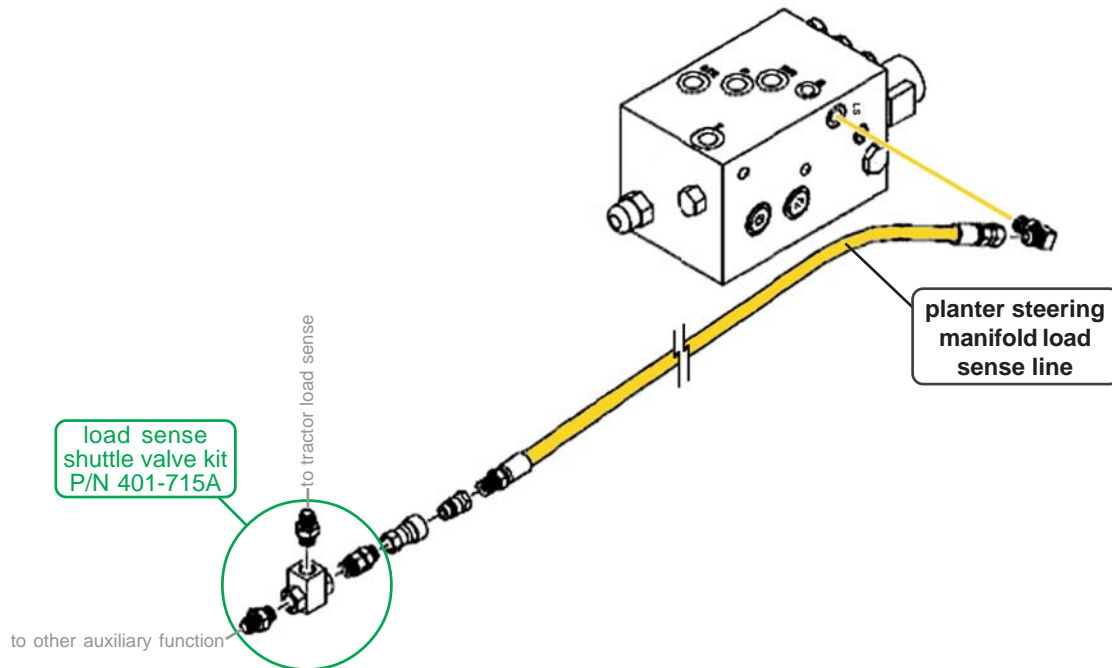
Tractors Equipped with Additional Accessories Connected to Power Beyond

Some tractors may be equipped with additional accessories that connect to power beyond connections on the rear of the tractor (i.e. auto steering). If the tractor power beyond connections are already in use, then there are exceptions that need to be followed for the particular type of tractor hydraulic system before tee's are installed for case drain, motor return, power beyond pressure, and load sense connections.

Determine the type of closed center hydraulic system and use the information provided for each type before connecting.

LS Closed with Load Sense Active

Tractors with this system must have a shuttle valve installed in the load sense line to be compatible with the 3PYP. The shuttle valve is required to determine which component requires and receives hydraulic pressure. Order and install load sense shuttle valve kit 401-715A, instructions are included in the kit. Once the load sense shuttle valve kit is installed, then the case drain, motor return, and power beyond pressure connections can be tee'd to add connections.



LS Closed with Load Sense By-Passed

If the load sense has been internally by-passed, then the load sense line on the planter steering manifold must be removed and the port must be plugged. See *Removing Planter Steering Manifold Load Sense Line* in this guide. Consult a tractor dealer for verification if the load sense has been internally by-passed. Case drain, motor return, and power beyond pressure can be tee'd. This system will not utilize a load sense connection.

PC Closed Hydraulic System

This tractor hydraulic system will not have a load sense connection. The load sense line on the planter steering manifold must be removed and the port must be plugged. See *Removing Planter Steering Manifold Load Sense Line* in this guide. Case drain, motor return, and power beyond pressure can be tee'd to add connections.

Removing Planter Steering Manifold Load Sense Line

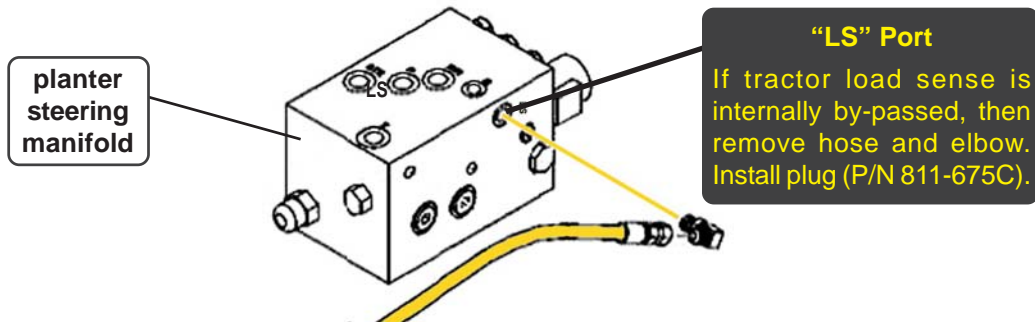
The load sense line must be removed from the planter steering manifold when:

- Connecting to a tractor with a PC Closed hydraulic system.

OR

- Connecting to a tractor with an LS Closed hydraulic system that has the load sense internally by-passed.

Remove the load sense hose and elbow from the “LS” port on the planter steering manifold. Plug the “LS” port with 9/16-18 MORB plug (Great Plains P/N 811-675C). Keep the hose and elbow for use when the planter is connected to a tractor with active load sense.



Terminology

Agricultural manufacturer's use different terminology to describe case drain, motor return, power beyond pressure, and load sense. Below is a list of terms used to describe them:

Case Drain	
Zero Pressure Return Motor Drain Motor Seal Drain Return Low Pressure Drain Return Low Flow Low Pressure Drain Free Return	Low Volume Sump Line Low Volume Case Drain Direct Outlet Pressure Sump Tank

Motor Return	
High Flow Low Pressure Return High Volume Hydraulic Motor Return High Volume Low Pressure Return Power Beyond Return	Tank Return Auxiliary Return Sump

Power Beyond Pressure	
Auxiliary Pressure Direct Outlet Pressure	High Pressure Carry Over

Load Sense	
Power Beyond Load Sense	Load Signal

Below is a list of abbreviations used in this guide to describe types of fittings:

- FORB Female O-Ring Boss
- FORFS Female O-Ring Face Seal
- MORB Male O-Ring Boss
- FJIC Female JIC
- MJIC Male JIC
- DIN Deutsch (German) Industrial Norm
- BSPB British Standard Parallel Pipe

Sourcing Adaptor Fittings

This guide lists part numbers for Eaton-Aeroquip and Parker hydraulic adaptor fittings since these two brands are widely used in North America. There are many other brands of hydraulic high pressure steel adaptor fittings available that can be used as long as the thread combinations match as shown in the illustrations. The part numbers listed can be used to cross reference with other brands if using a local hydraulic distributor or supplier.

Find your nearest **EATON-Aeroquip** hydraulic fittings and couplers distributor on-line at <http://web.fluidpower.eaton.com/public/distributorlocator/>
 or
 by calling toll free 888-258-0222

Find your nearest **Parker** hydraulic fittings and couplers distributor on-line at www.parker.com
 or
 by calling toll free 800-272-7537

IMPORTANT!

DO NOT tee case drain into motor return. Case drain must have zero pressure return. Great Plains warranty will be voided if case drain has been connected and/or teed to a motor return line. Case drain should only be returned directly to the hydraulic reservoir. The case drain line must utilize an ISO 16028 coupler that will allow seepage due to thermal expansion when disconnected from the tractor.

DO NOT connect the fan motor to power beyond pressure. Continuous flow through the power beyond will deprive the tractor rear differential and pto drive gears of hydraulic flow and cause damage to the tractor.

If tractor case drain circuit is filtered, it is necessary to make sure to have a clean filter to prevent excessive case pressure. High case pressure will cause motor seal failure.

Some tractor manufacturer's have chosen to use the same type coupler for power beyond load sense lines as for case drain lines. It is very important that these not be confused to prevent motor seal damage. **DO NOT** connect the case drain hose to a power beyond load sense coupler.

The motor return couplers and power beyond pressure couplers are the same. **DO NOT** confuse these two connections or damage to the fan motor will occur.

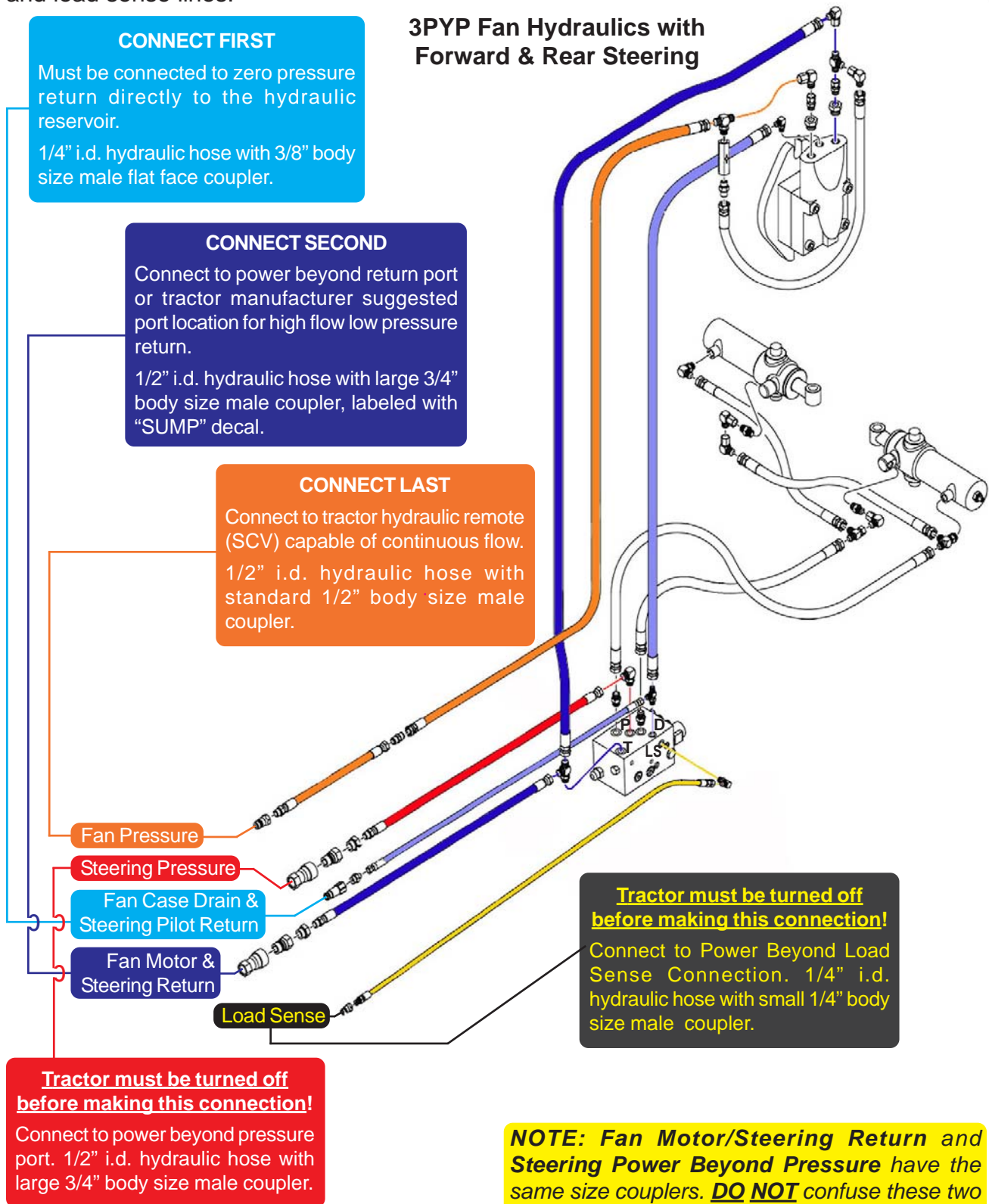
Some tractor manufacturer's recommend running motor return through a tractor SCV return port. **DO NOT** run motor return through a tractor SCV return port. Minimum pressure on most tractor SCV return ports is approximately 250 to 300 psi. Only connect motor return to a motor return port. Motor return ports allow pressures less than 50 psi, which prolongs motor seal life.

Failure to use the correct motor return port can cause oil starvation to the transmission pump and hydraulic charge circuit on some tractors. This is caused when oil is returned into the differential housing rather than the transmission or hydraulic charge circuit.

Make sure all hydraulic couplers and hose ends are clean before connecting.


Connecting Fan Motor & Steering to Tractor



Always connect case drain first, motor return second, then fan pressure line to prevent motor damage. Always disconnect fan pressure line first, motor return second, then case drain last to prevent motor damage. Tractor must be turned off before connecting power beyond pressure and load sense lines.



Tractor Models

This guide lists port locations for connecting case drain, motor return, power beyond pressure, and load sense for John Deere, Case-IH, New Holland, Massey, AGCO, Challenger, & Fendt tractors. See the tables for each tractor manufacturer to find the models included in each series.

 JOHN DEERE			
8010 Series	8010T Series	8020 Series	8020T Series
8410	8410T	8420 8520	8420T 8520T
8030 Series	8030T Series	8000R Series	8000RT Series
8330 8430 8530	8330T 8430T -	8245R 8270R 8295R 8320R 8345R	- - 8295RT 8320RT 8345RT
Information for these tractor models can be found on pages 1 though 4.			

			
MX Series	Magnum Series	TG Series	T8000 Series
MX275 MX285 MX305	275 305 335	TG275 TG285 TG305	T8030 T8040 T8050
Information for these tractor models can be found on page 5.			



DTA Series	DTB Series
DT240A	DT250B DT275B



8400 Series	8600 Series
8480	8670 8680



900 Vario Series (Com 3)
927
930
933
936



MT600 Series
MT665B
MT665C
MT675C
MT685C

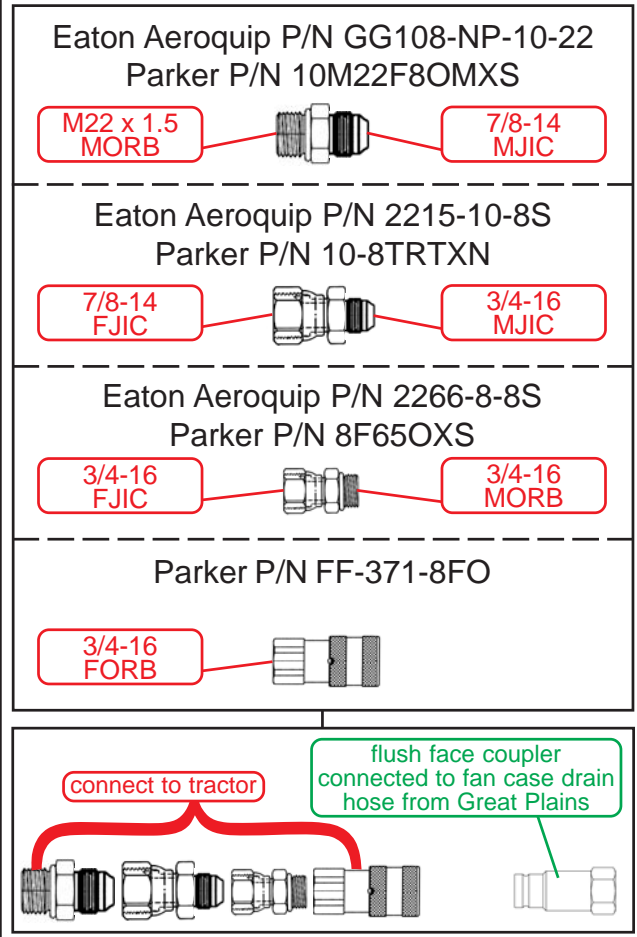
Information for these tractor models can be found on pages 6 through 10.

Power Beyond Adaptors & Couplers

The parts shown for case drain, motor return, power beyond pressure, and load sense apply to all John Deere tractors listed in this guide.

Case Drain

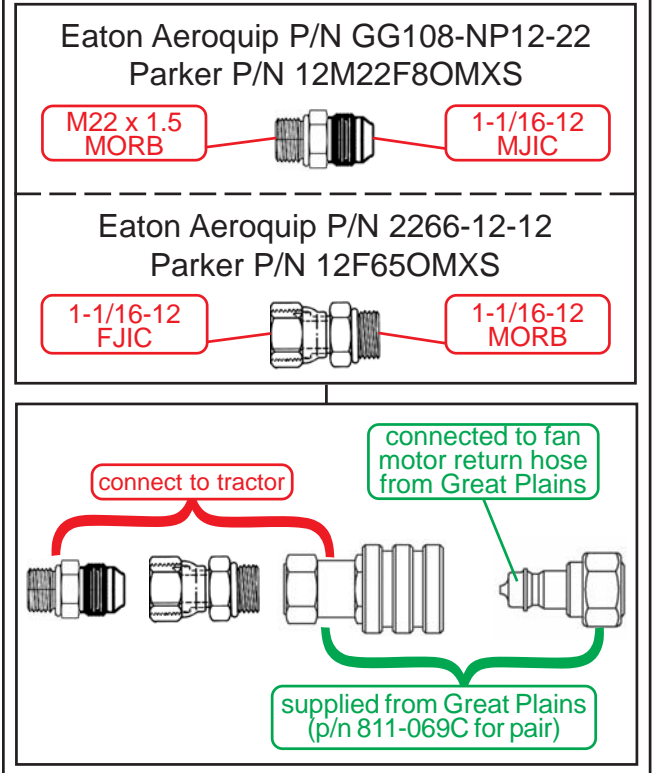
If the tractor is not equipped with a 3/8" body size female flat face case drain coupler, then order and install the following parts:



IMPORTANT: ALWAYS connect case drain first, motor return second, then fan pressure line to prevent motor damage. **ALWAYS disconnect** fan pressure line first, motor return second, then case drain last to prevent motor damage.

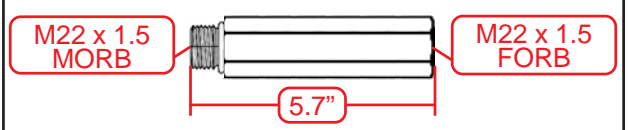
Motor Return

If the tractor is not equipped with a 3/4" body size, ISO 7241-1 Series A, female motor return coupler, then order and install the following parts:



NOTE: Can use John Deere P/N RE248312 to extend case drain coupler and motor return coupler out from rear of tractor if needed.

John Deere P/N RE248312



Power Beyond Adaptors & Couplers

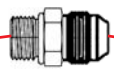
The parts shown for case drain, motor return, power beyond pressure, and load sense apply to all John Deere tractors listed in this guide.

Power Beyond Pressure

If the tractor is not equipped with a 3/4" body size, ISO 7241-1 Series A, female power beyond pressure coupler, then order and install the following parts:

Eaton Aeroquip P/N GG108-NP12-22
Parker P/N 12M22F8OMXS

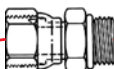
M22 x 1.5
MORB



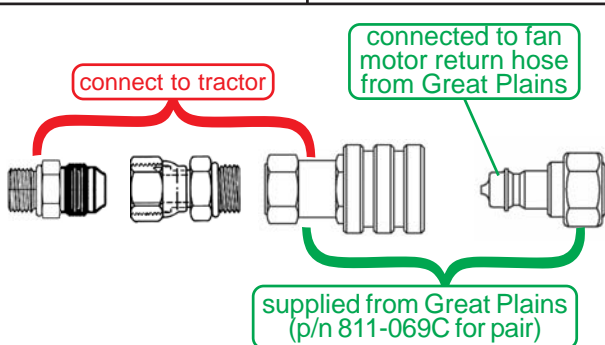
1-1/16-12
MJIC

Eaton Aeroquip P/N 2266-12-12
Parker P/N 12F65OMXS

1-1/16-12
FJIC



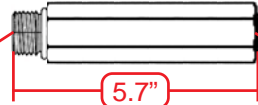
1-1/16-12
MORB



NOTE: Can use John Deere P/N RE248312 to extend power beyond pressure coupler out from rear of tractor if needed.

John Deere P/N RE248312

M22 x 1.5
MORB



M22 x 1.5
FORB

Load Sense

If the tractor is not equipped with 1/4" body size female load sense coupler, then order and install the following parts:

Eaton Aeroquip P/N GG108-NP-06-14
Parker P/N 6M14F8OMXS

M14 x 1.5
MORB



9/16-18
MORB

connect to tractor



load sense coupler
connected to load sense
hose from Great Plains

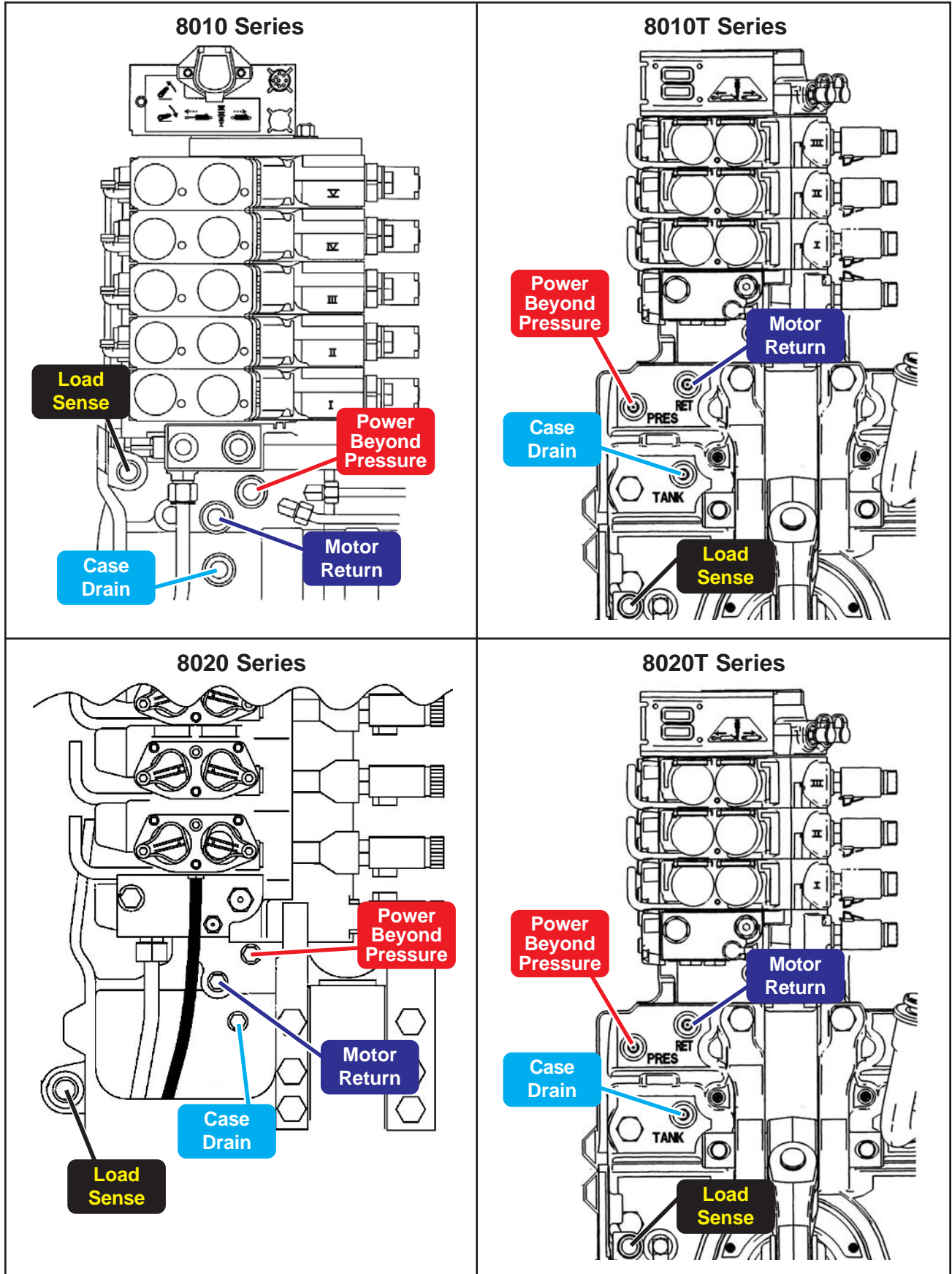
p/n 841-466C

p/n 841-467C

supplied from Great Plains
(p/n 841-457C for pair)

IMPORTANT: Tractor must be turned off before connecting power beyond pressure and load sense lines.

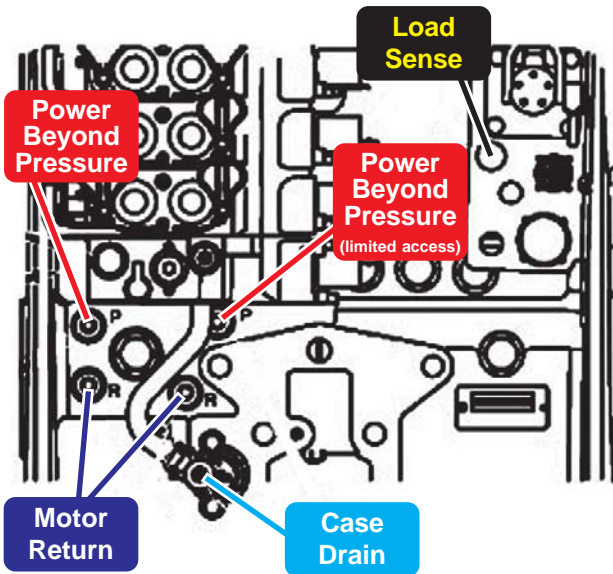
Port Locations



Great Plains Manufacturing reserves the right to make changes or to add improvements to this guide at any time without notice or obligation.

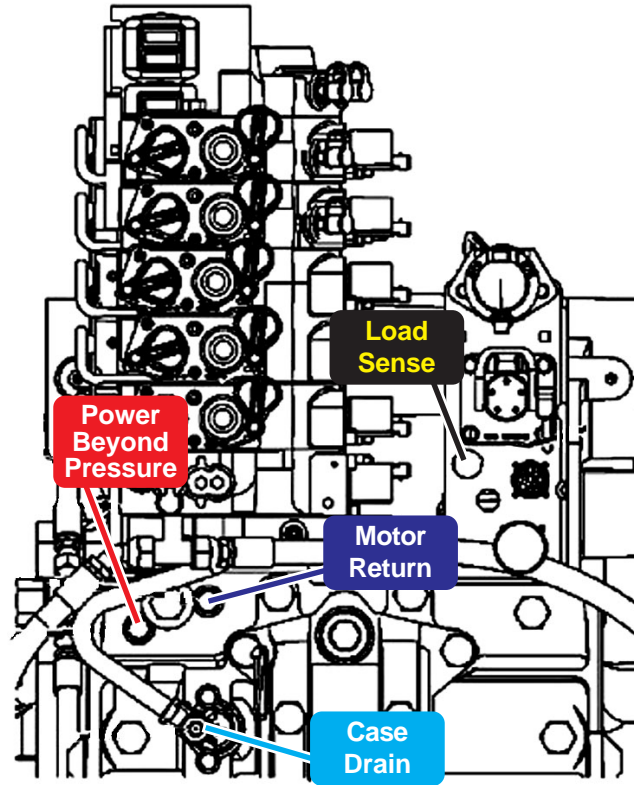
Port Locations

8030 Series

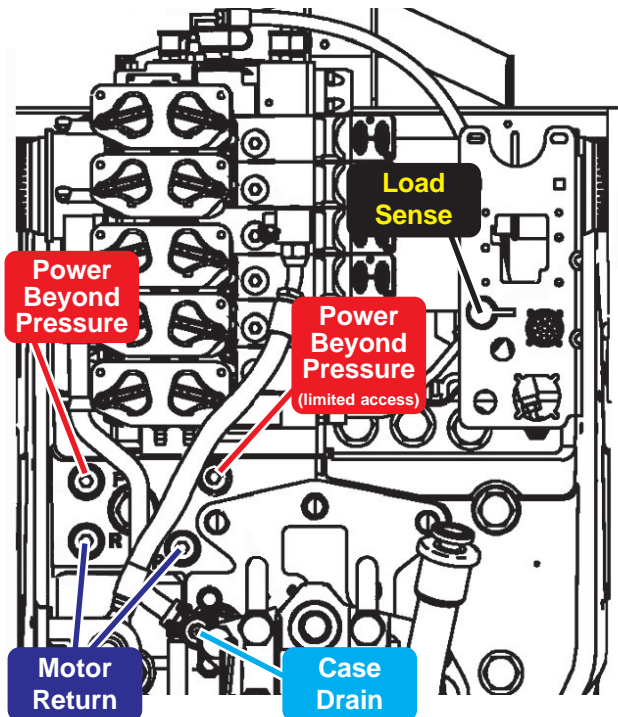


NOTE: Two possible *power beyond pressure* and *motor return* port locations are shown.

8030T Series

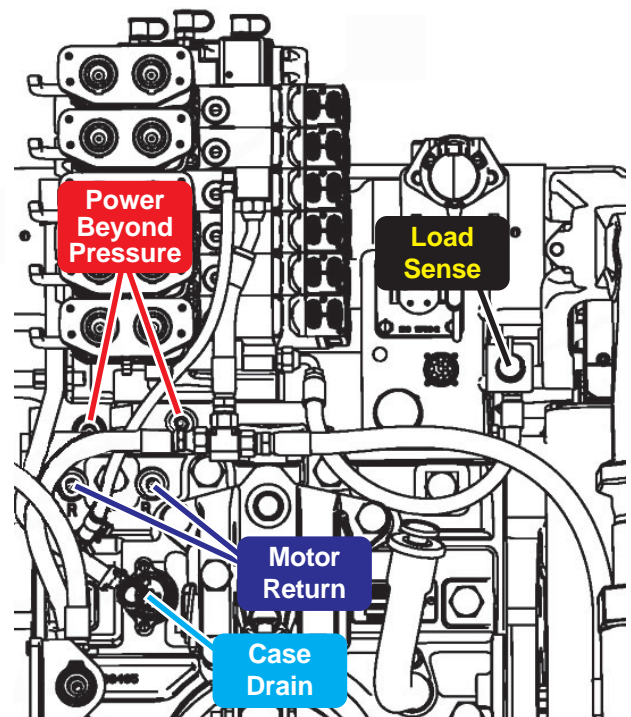


8000R Series



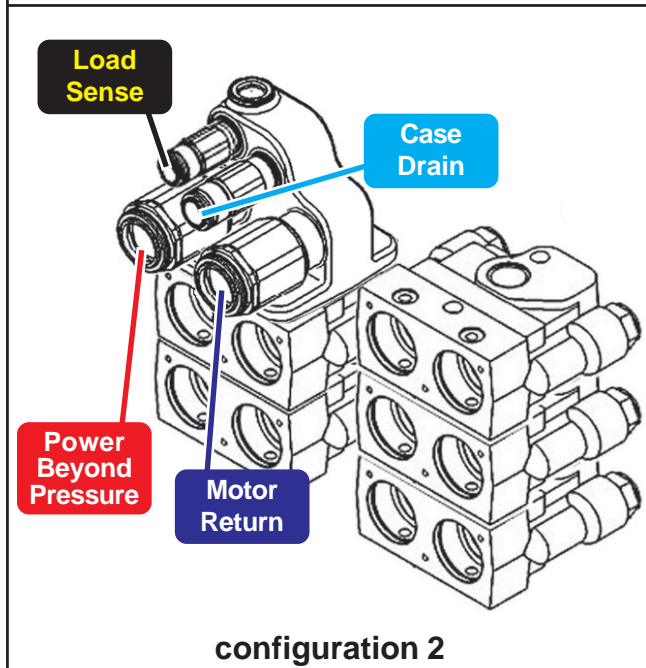
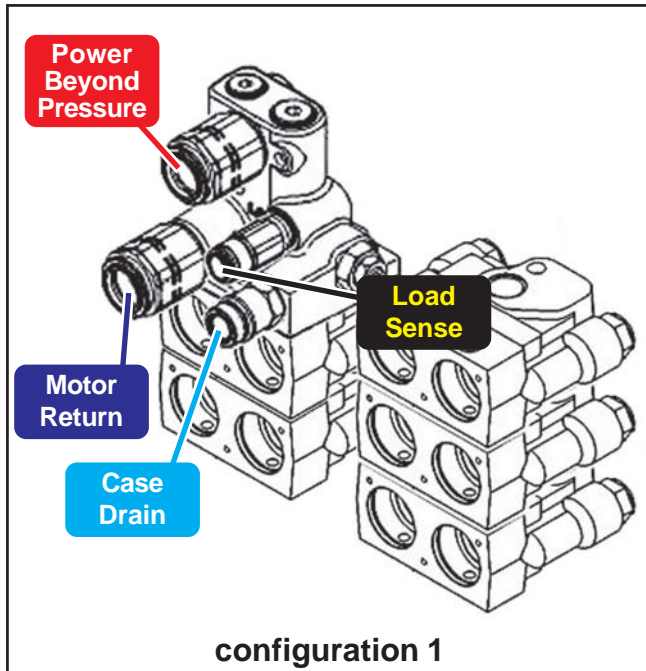
NOTE: Two possible *power beyond pressure* and *motor return* port locations are shown.

8000RT Series



NOTE: Two possible *power beyond pressure* and *motor return* port locations are shown.

Port Locations
MX Series
Magnum 275, 305, & 335
TG & T8000 Series



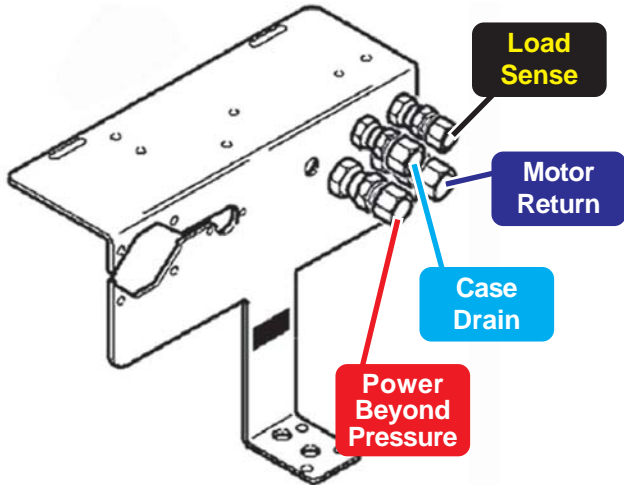
These tractor models must be equipped with optional power beyond to have case drain and motor return connections. Consult your Case-IH and/or New Holland dealer for parts needed to install power beyond.

The couplers supplied through Case and/or New Holland are compatible with the couplers supplied from Great Plains.

IMPORTANT: *ALWAYS connect case drain first, motor return second, then fan pressure line to prevent motor damage. ALWAYS disconnect fan pressure line first, motor return second, then case drain last to prevent motor damage.*

IMPORTANT: *Tractor must be turned off before connecting power beyond pressure and load sense lines.*

Port Locations, Adaptors, & Couplers for 8400 Series / DTA Series / MT600B Series


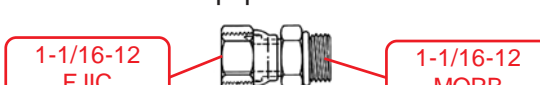
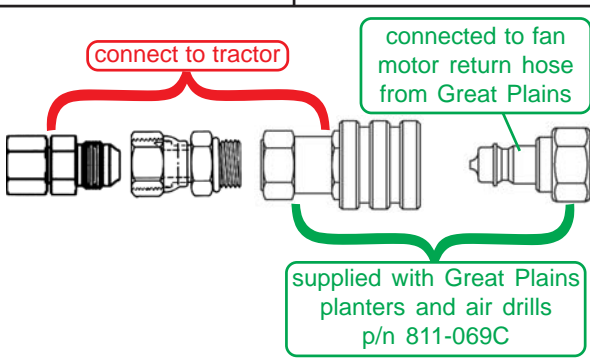


IMPORTANT: ALWAYS connect case drain first, motor return second, then pressure line to prevent motor damage. ALWAYS disconnect pressure line first, motor return second, then case drain last to prevent motor damage.

IMPORTANT: Tractor must be turned off before connecting power beyond pressure and load sense lines.

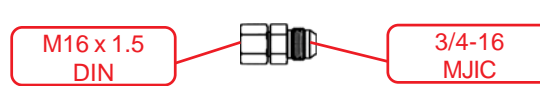
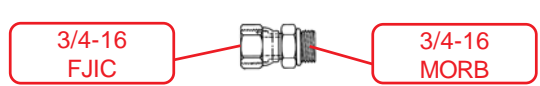

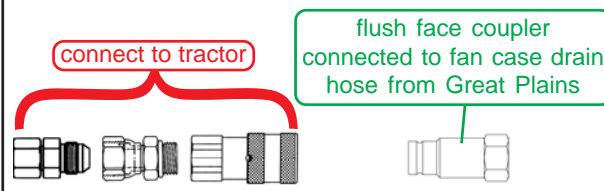
Motor Return & Power Beyond Pressure

If the tractor is not equipped with 3/4" body size ISO 7241-1 Series A female couplers, then order and install the following parts:

Eaton Aeroquip P/N 15.163-16-12

Eaton Aeroquip P/N 2266-12-12S





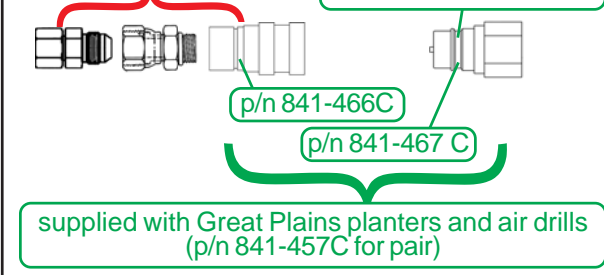
Case Drain

If the tractor is not equipped with a 3/8" body size female flat face case drain coupler, then order and install the following parts:

Eaton Aeroquip P/N 15.163-8-8

Eaton Aeroquip P/N 2266-8-8S

Eaton Aeroquip P/N FF-371-8FO



Load Sense

If the tractor is not equipped with 1/4" body size load sense coupler, then order and install the following parts:

Eaton Aeroquip P/N 15.163-10-8

Eaton Aeroquip P/N 2266-6-8S



Determining Type of Fittings Needed for 8600 Series / DTB Series / MT600C Series

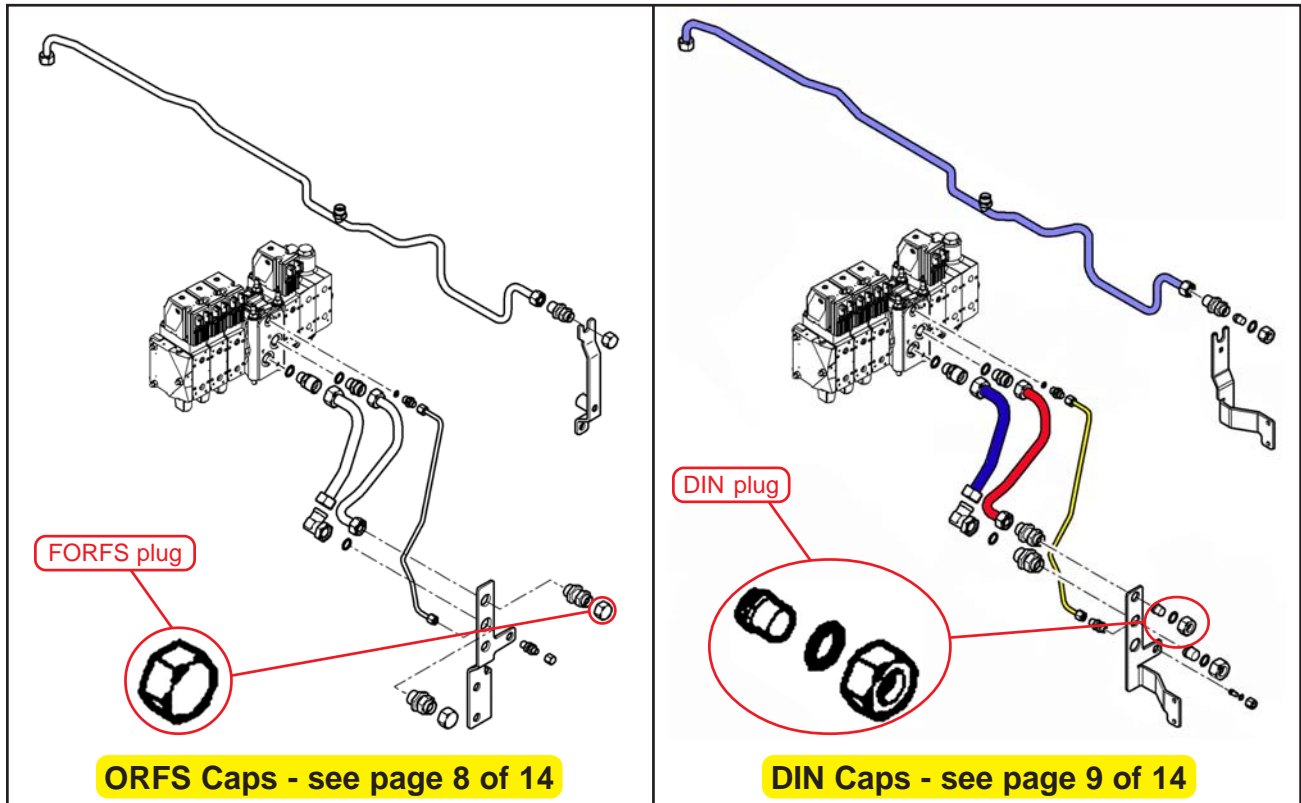
These tractor models may or may not be equipped with power beyond lines from the factory. The part numbers given for these models is assuming the power beyond lines are installed. Contact an AGCO dealer if power beyond lines are not installed.

IMPORTANT: *The couplers called out in the AGCO parts books for the case drain and load sense connections are **NOT** compatible and must be changed.*

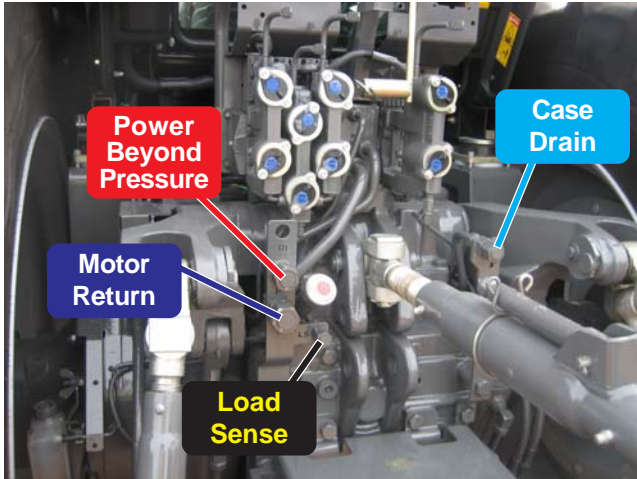
AGCO calls for using a female flat face coupler for load sense and a standard 1/2" male coupler for the case drain which are not compatible. Case drain requires a 3/8" body size ISO 16028 zero pressure female flat face coupler. Load sense requires a 1/4" body size female coupler.

The couplers supplied through AGCO for motor return and power beyond pressure are compatible and can be used.

There are two different types of fittings used on these models of tractors. The difference is in the type of caps on the bulkhead fittings. One type is ORFS (one piece), the other type is DIN. Determine which type of caps are on the tractor and use the correct diagram and parts listing on the following two pages to install adaptor fittings for case drain and load sense couplers.



Port Locations, Adaptors, & Couplers for 8600 Series / DTB Series / MT600C Series (with ORFS caps)



IMPORTANT: ALWAYS connect case drain first, motor return second, then pressure line to prevent motor damage. ALWAYS disconnect pressure line first, motor return second, then case drain last to prevent motor damage.

IMPORTANT: Tractor must be turned off before connecting power beyond pressure and load sense lines.

Motor Return

If the tractor is not equipped with 3/4" body size ISO 7241-1 Series A female motor return coupler, then order and install part number 4293732M2 from an AGCO dealer.

This motor return coupler is male and has a bulkhead. Remove the bulkhead fitting from the tractor motor return line (labeled "T") and install this bulkhead coupler. Also, remove the male coupler from the motor return hose on the planter, then install one of the 3/4" body size ISO 7241-1 Series A female coupler supplied with the planter.

Power Beyond Pressure

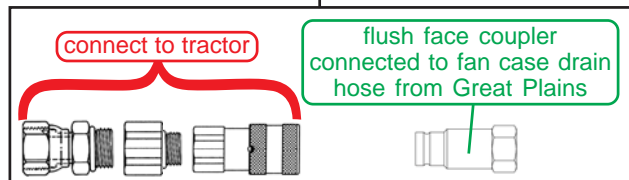
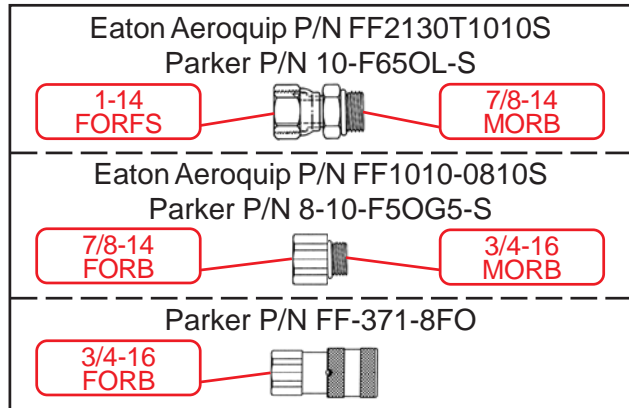
If the tractor is not equipped with 3/4" body size ISO 7241-1 Series A female power beyond pressure coupler, then order and install part number 4293730M2 from an AGCO dealer.

This power beyond pressure coupler has a bulkhead. Remove the bulkhead fitting from the power beyond pressure line (labelled "P") and install the bulkhead coupler.

IMPORTANT: The couplers called out in the AGCO parts books for the case drain and load sense connections are **NOT** compatible and must be changed.

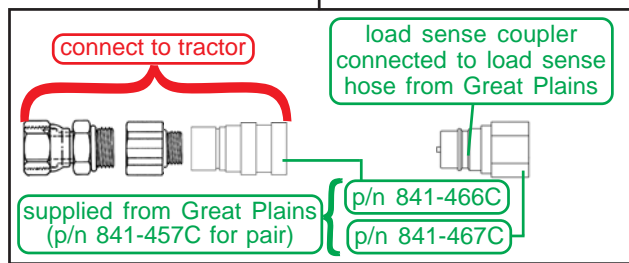
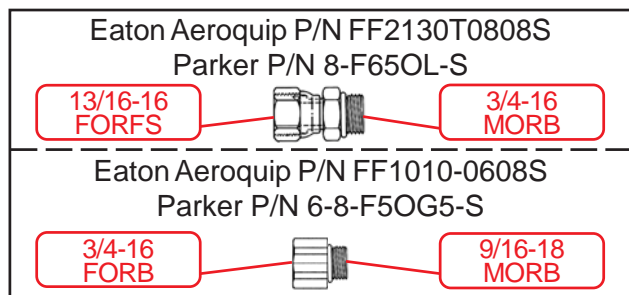
Case Drain

If the tractor is not equipped with a 3/8" body size female flat face case drain coupler, then order and install the following parts:

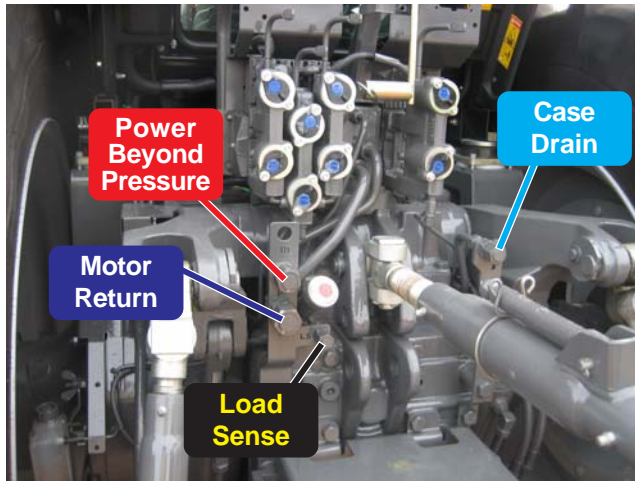


Load Sense

If the tractor is not equipped with 1/4" body size load sense coupler, then order and install the following parts:



Port Locations, Adaptors, & Couplers for 8600 Series / DTB Series / MT600C Series (with DIN caps)



IMPORTANT: ALWAYS connect case drain first, motor return second, then pressure line to prevent motor damage. ALWAYS disconnect pressure line first, motor return second, then case drain last to prevent motor damage.

IMPORTANT: Tractor must be turned off before connecting power beyond pressure and load sense lines.

Motor Return

If the tractor is not equipped with 3/4" body size ISO 7241-1 Series A female motor return coupler, then order and install part number 4293732M2 from an AGCO dealer.

This motor return coupler is male and has a bulkhead. Remove the bulkhead fitting from the tractor motor return line (labeled "T") and install this bulkhead coupler. Also, remove the male coupler from the motor return hose on the planter, then install one of the 3/4" body size ISO 7241-1 Series A female coupler supplied with the planter.

Power Beyond Pressure

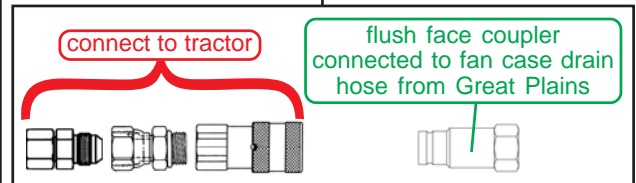
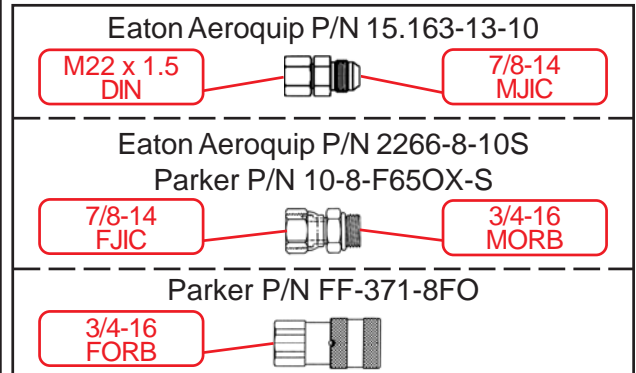
If the tractor is not equipped with 3/4" body size ISO 7241-1 Series A female power beyond pressure coupler, then order and install part number 4293730M2 from an AGCO dealer.

This power beyond pressure coupler has a bulkhead. Remove the bulkhead fitting from the power beyond pressure line (labelled "P") and install the bulkhead coupler.

IMPORTANT: The couplers called out in the AGCO parts books for the case drain and load sense connections are **NOT** compatible and must be changed.

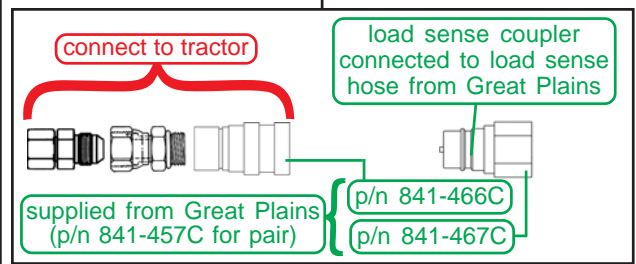
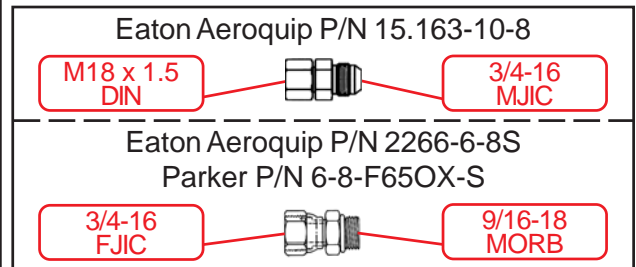
Case Drain

If the tractor is not equipped with a 3/8" body size female flat face case drain coupler, then order and install the following parts:



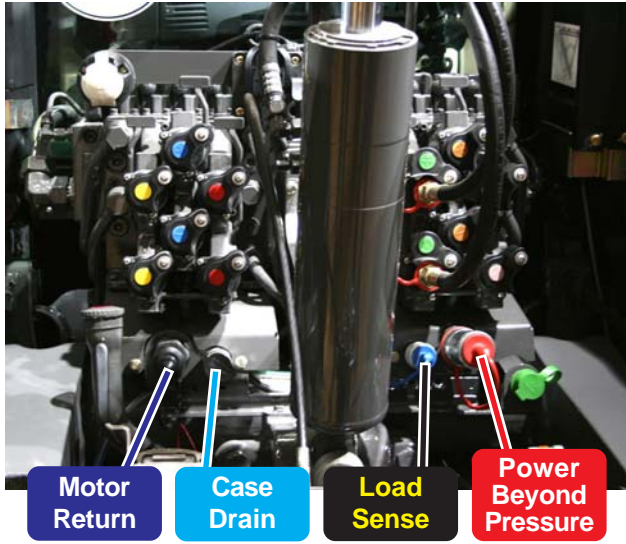
Load Sense

If the tractor is not equipped with 1/4" body size load sense coupler, then order and install the following parts:





Port Locations 900 Vario Series Com 3



All North American Com 3 tractors have power beyond couplers installed from the factory. These couplers are compatible with the couplers supplied from Great Plains.

However, the motor return coupler installed on the tractor from the factory is male. Remove the male coupler from the motor return hose on the planter. Then install a 3/4" body size ISO 7241-1 Series A female coupler supplied with the planter.

IMPORTANT: *ALWAYS connect case drain first, motor return second, then pressure line to prevent motor damage. ALWAYS disconnect pressure line first, motor return second, then case drain last to prevent motor damage.*

IMPORTANT: *Tractor must be turned off before connecting power beyond pressure and load sense lines.*