



**MASSEY FERGUSON**

# MF Global Series Product Book

**MF 6700R Series (AFRICA)**



FROM MASSEY FERGUSON



# Contents

---

<b>Chapter</b>	<b>Page Number</b>
Introduction	5
Engine	11
Transmission	23
Rear Axle	37
Power Take off	43
Front Axle	45
Hydraulic System	49
Rear Linkage	53
Operator Environment	59
Electrics	69
Wheels and Tyres	71
Technology	75
Specification	77



# Introduction

---

## Massey Ferguson 6700R Series

The **Massey Ferguson 6700R Series** tractors are a development of the well renowned **Massey Ferguson Global Series**. A development on the sound platform established by this range, the **MF 6700R** offers a higher specification of transmissions, hydraulics and technology required by customers in the 110-135hp (82-100kW) segment.

The project is led by a dedicated engineering team at the **Massey Ferguson** worldwide engineering centre in Beauvais, France with additional support from **Massey Ferguson** and **AGCO Power** teams globally. The new tractors are being built using the very latest manufacturing and assembly techniques at the **Massey Ferguson** factory in Canoas, Brazil.



## Introduction

---

### **Massey Ferguson 6700R Series** continued

The **Massey Ferguson 6700R Series** offers three models ranging from 112 to 132 hp (83 to 98 kW) for agricultural and horticultural markets which require a machine that is rugged and reliable, simple to operate and able to cope with the a range of different tasks.

These markets cover a large geographical region that encompasses small scale farms, dairy and livestock farms through to large agri-businesses and plantations.

Our customers in these regions grow a wide variety of crops from rice and wheat, fruit and vegetables, cotton, coffee, tobacco, sugar and vines for wine production as well as those customers who farm livestock and poultry for meat production.

The **Massey Ferguson 6700R Series** tractors feature a new design using the latest engineering techniques to give enhanced performance and economy never seen before on a machine in this sector of the market.



## Introduction

---

### **Massey Ferguson 6700R Series** continued

AGCO Power four cylinder engines provide power for **Massey Ferguson 6700R Series**, engines that are renowned for their reliability, ruggedness and good fuel economy.

New transmissions offering 16 forward and 16 reverse semi-powershift changes, and power shuttle with the world renowned **Massey Ferguson** Power Control Lever. The right speed for each job is easily selected.

All tractors are specified with a fully independent PTO clutch (IPTO), offering 540 / 540E / 1000 rpm.

A Closed Centre Load Sensing (CCLS) hydraulic system is specified offering up to 110 litres/min for rear linkage and auxiliary spool valves.

The rear linkage has a lift capacity of 5200 kg allowing to **Massey Ferguson 6700R Series** tractors to handle a broad range of implements and applications.

All models are specified with an air conditioned cab with all the main controls grouped to the right of the operator. A large dashboard provides clear and concise information on tractor operation and performance.

Whatever the application or customer requirement, the straightforward and dependable **Massey Ferguson 6700R Series** will consistently meet and exceed expectations.



# Introduction

Optional Auto-Guide ready configuration

Pillar mounted exhaust

Pivoting metal engine bonnet

Electro-hydraulic 4WD engagement

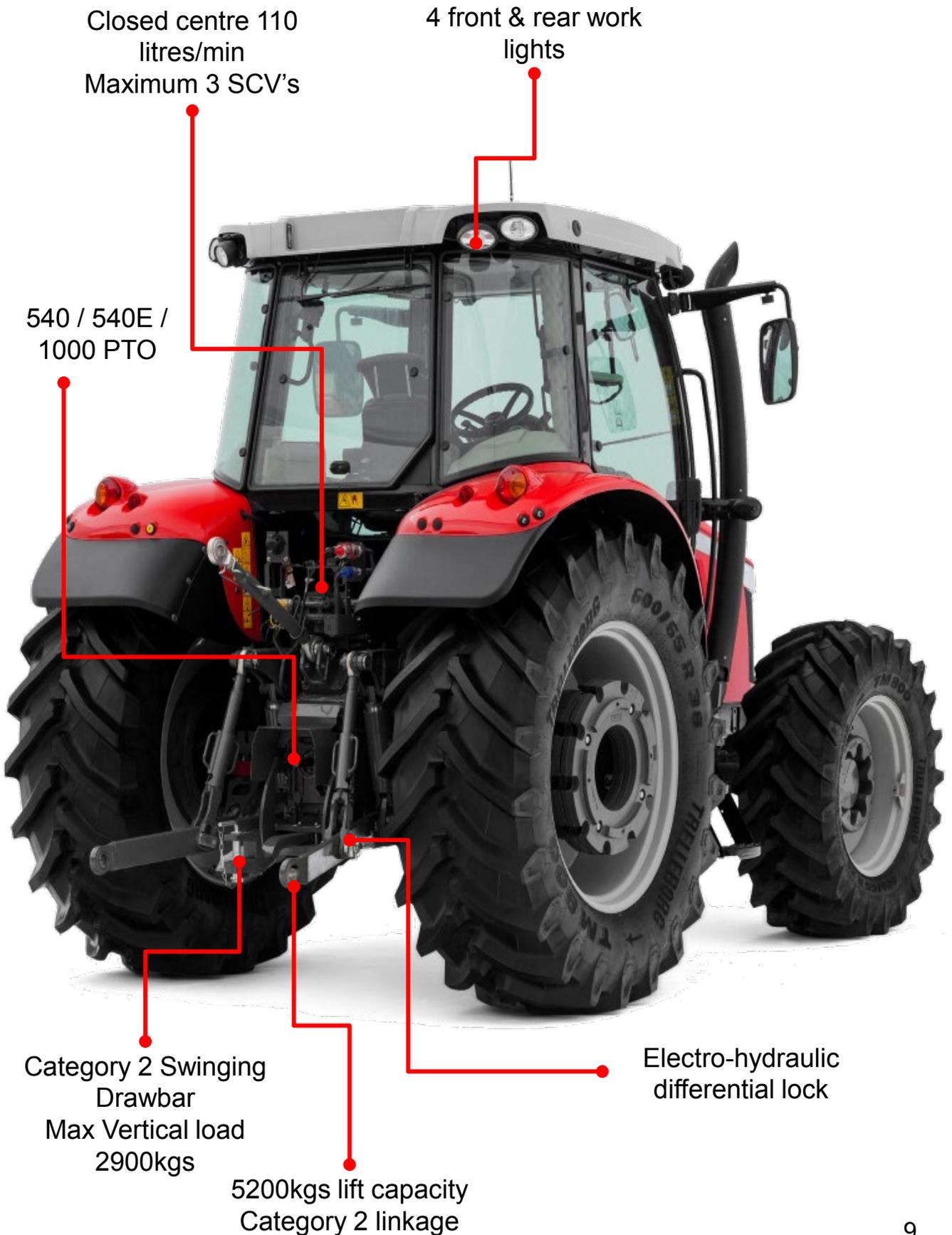
Dyna-4 Transmission

Excellent cab access

High capacity fuel tank



# Introduction





# Engine

---

## Introduction

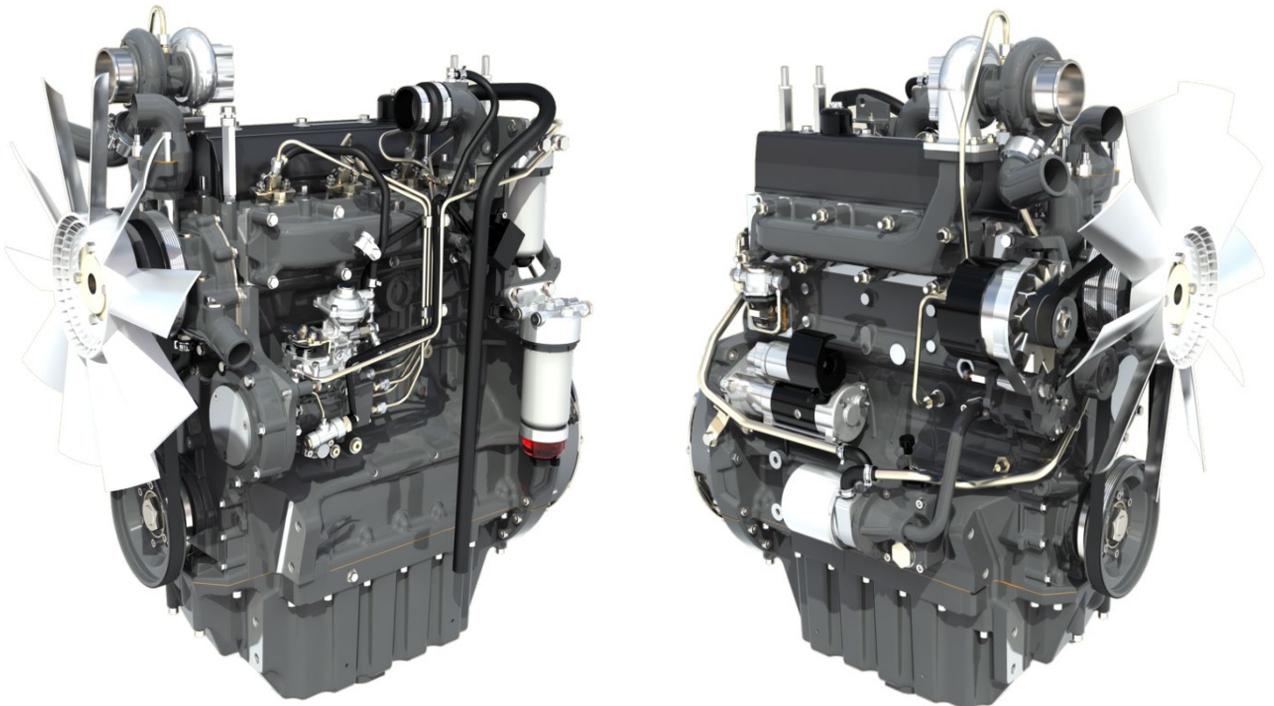
Four cylinder turbocharged and intercooled engines from **AGCO Power** are specified for **Massey Ferguson 6700R Series** tractors.

**AGCO Power AP44 DTIC2** engines are used in all 3 models and are manufactured in the **AGCO Power** facility in Mogi das Cruzes, Brazil. **AGCO Power** engines have been installed in **Massey Ferguson** tractors for many years and are renowned for high levels of torque, good fuel efficiency and low running costs.

All engines are configured to meet Tier 2 emissions standards and are specifically designed to suit the requirements of agricultural applications where high levels of power and torque are essential and their rugged construction provides enhanced reliability.

A low rated engine speed of only 2200 revs/min enhances fuel efficiency whilst also minimising noise and wear and tear. The long stroke design provides high levels of torque across a broad speed range with maximum torque being achieved at only 1200 revs/min

The four-cylinder direct injection engines specified in the **MF 6700R Series** are extremely compact in design, allowing the fuel tank capacity to be maximised for prolonged working hours.



# Engine

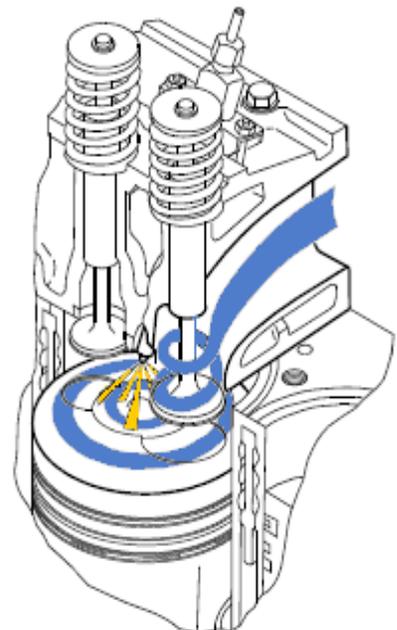
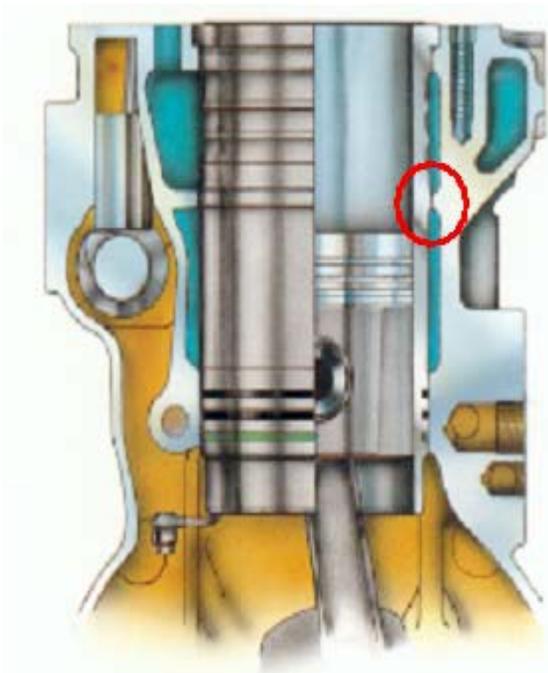
## AGCO Power AP44 Engine

The Cylinder block, Crankshaft, Pistons etc. are specifically designed for turbocharged engines to absorb the additional forces created and convert them into usable power allowing smaller engines to produce higher power and torque.

The cylinder block is fitted with replaceable wet liners giving enhanced cooling with increased cooling to the top of the liner and cylinder block where the heat is greatest. The wet liners and cylinder block are designed with a mid support, minimising vibration and noise. Special O-rings fitted to the bottom of the cylinder liners keep the engine coolant sealed in the cooling jacket.

The cylinder head has a cross flow design with 2 valves per cylinder for optimum gas flow and engine breathing. This configuration maintains the optimum fuel mix for maximum power and economy.

The piston is made of a eutectic aluminium alloy and is graphite coated reducing weight and friction increasing power available at the flywheel. In the upper face of the piston there is a combustion chamber, the shape of which maximises the mixture of air and fuel.



# Engine

---

## **AGCO Power AP44 Engine continued**

The engine features a mechanical Bosch rotary injection pump and dual fuel filters all located on the cool side of the engine. A water separator is also included. Both of these features improve the engine's ability to cope with fuel of differing qualities whilst still providing excellent fuel economy and power output.

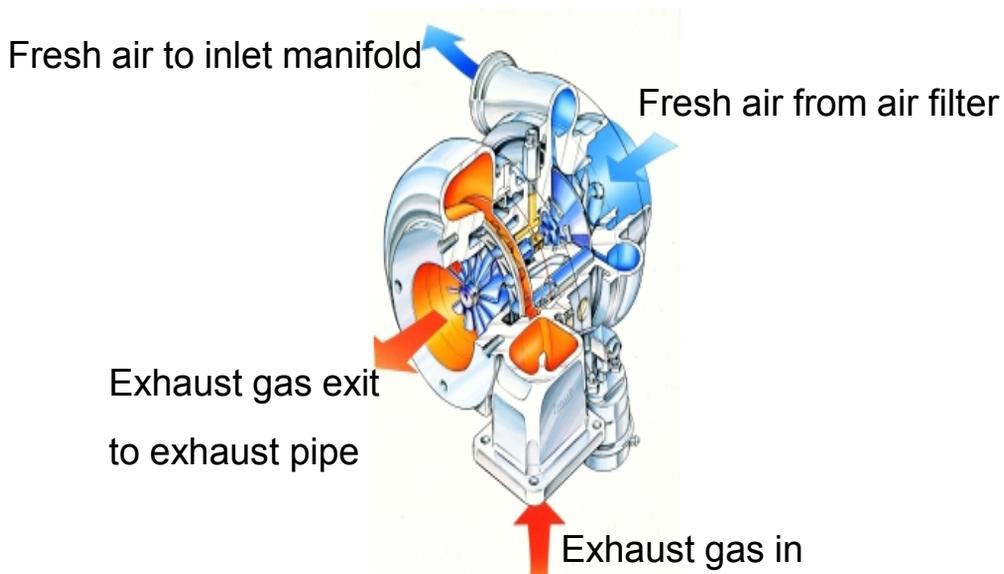


# Engine

## AGCO Power AP44 Engine continued

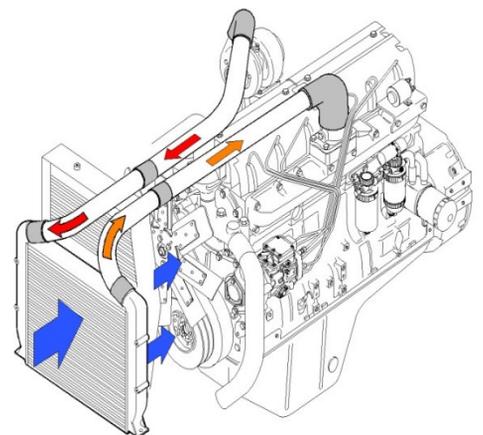
### Turbocharger

All engines fitted to the **MF 6700R Series** feature a turbocharger providing excellent torque characteristics at lower engine speeds and enhanced engine performance at higher altitudes where the air density is thinner. The turbocharger compresses the air before it enters the engine, thereby enabling a greater quantity of fuel to be vaporised and more power generated for the same engine displacement.



### Intercooler Air/Air

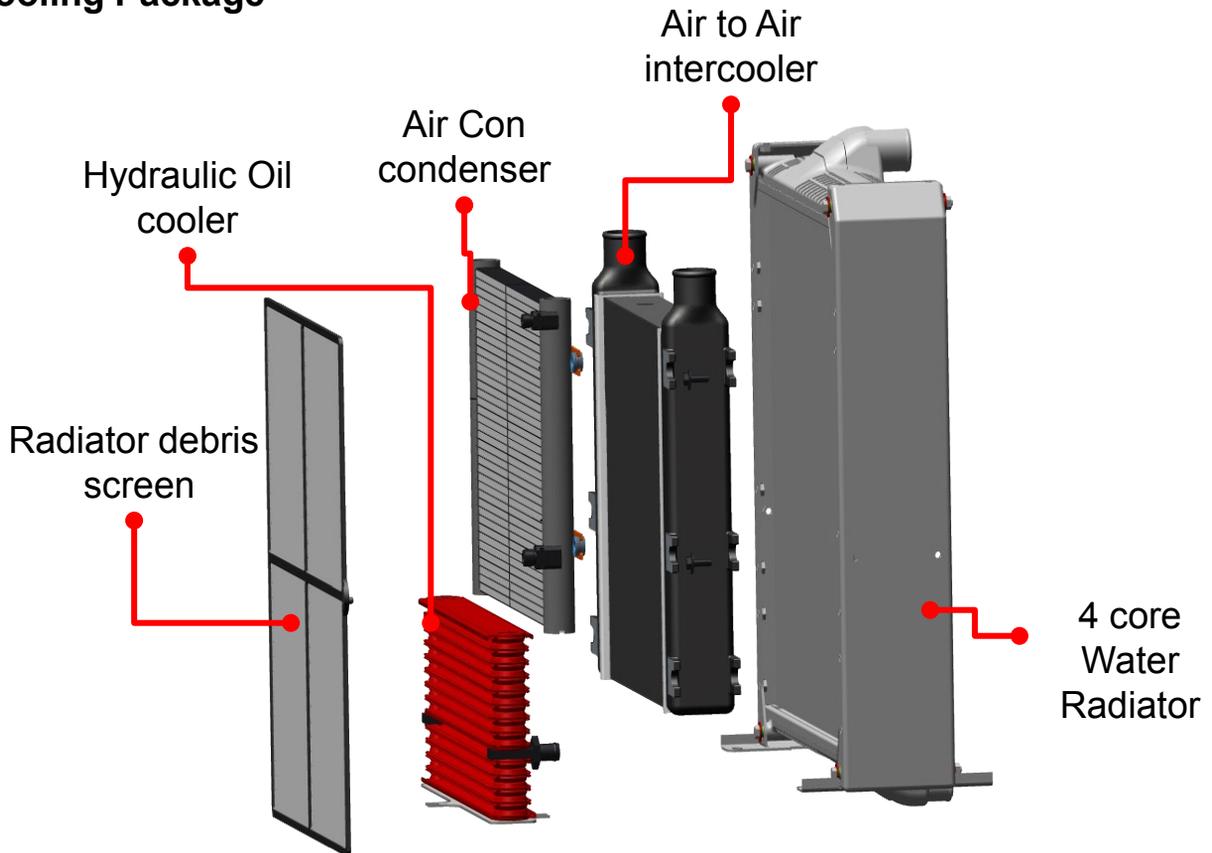
The intercooler reduces the temperature of the air after the compression caused by the turbocharger so that combustion efficiency is improved through increased air density. An air to air intercooler system is standard on all **MF 6700R** models.



# Engine

## AGCO Power AP44 Engine continued

### Cooling Package



As standard the **Massey Ferguson 6700R Series** is fitted with a 4 core radiator to give greater cooling efficiency in hot climates. A hydraulic oil cooler is standard fitment ensuring that hydraulic oil is also cooled. High temperatures degrade the lubrication & cooling properties of oil reducing working life of hydraulic pumps, valves, gearbox components & bearings. This is of particular importance in climates with high ambient temperatures or demanding hydraulic applications, where oil is constantly being pumped from the tractor to an implement and can cause excessive heating of the oil.

A removable screen is also provided to catch larger debris which could reduce airflow through the cooling pack. The screen is easily removed for cleaning and allows unhindered access to the cooling system elements when required.

The 8 blade cooling fan is belt driven by the engine crankshaft. This ensures there is always adequate airflow through the cooling pack, particularly important when powering stationary PTO powered implements.

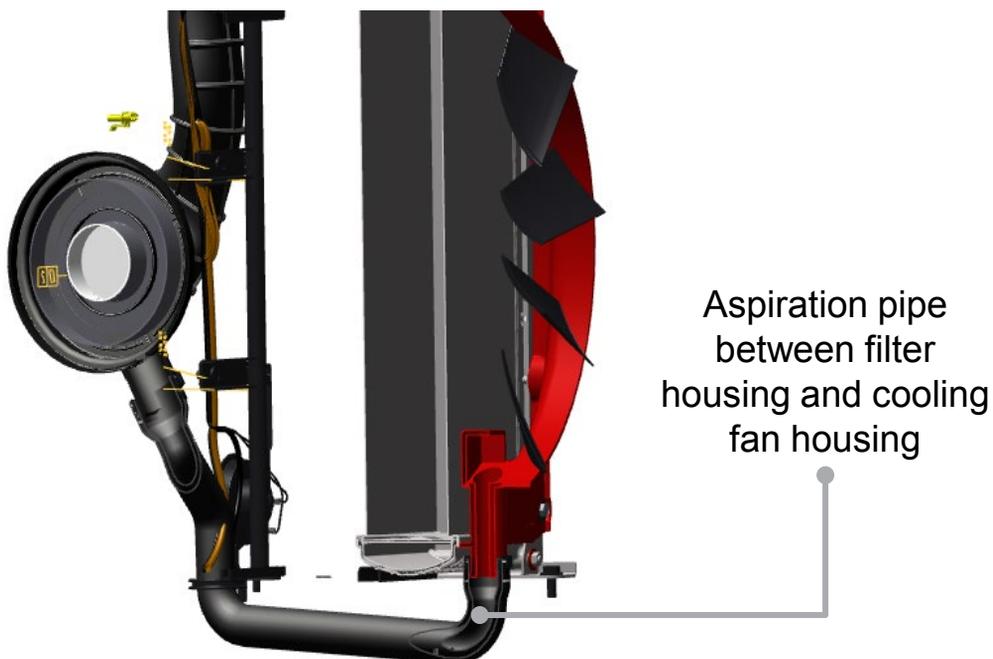
# Engine

## AGCO Power AP44 Engine continued

### Air Filter

The dual dry element engine air filter is located in front of the cooling pack away from the dust generated by the motion of the tractor and rear mounted implements. It is easily accessed for maintenance underneath the opening engine hood.

Pre-filtration is performed by an aspiration system that uses the suction provided by the engine cooling fan to remove dust and debris ahead of the primary air filter. This enhances the efficiency of the air filtration system whilst also extending the life of the filter elements.



# Engine

---

## **AGCO Power AP44 Engine** continued

### **Key features include:**

- Rotary injection pump - for straightforward reliable performance
- Dual fuel filters - for maximum filtration before the fuel reaches the engine
- Canister oil filter - for maximum contaminant removal and simple maintenance
- Dual element air filter with aspirated air pre-filter – for enhanced engine protection and clean running in the most arduous of conditions
- Turbocharged - boosts power especially at higher altitudes where air is thinner
- 400 hour service intervals.

### **Key benefits include:**

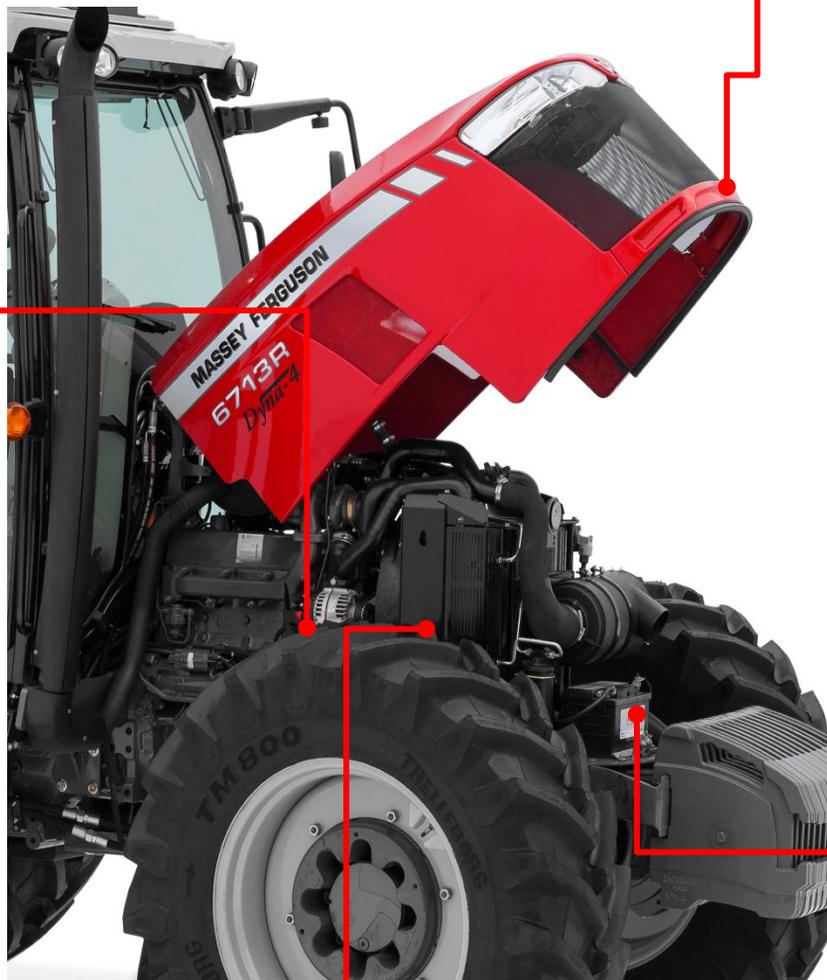
- Low rated engine speed for durability, economy and operator comfort
- Good power to weight ratio for greater productivity
- Reduced complexity
- Easy access encourages regular servicing and maintenance avoiding expensive breakdowns

# Engine

## Engine Maintenance

Easy to access engine oil dipstick & filler on right hand side of engine

Pivoting front bonnet offers easy access for servicing and maintenance



Easy to clean cooling package including hydraulic oil cooler and engine radiator

Excellent battery accessibility for battery maintenance

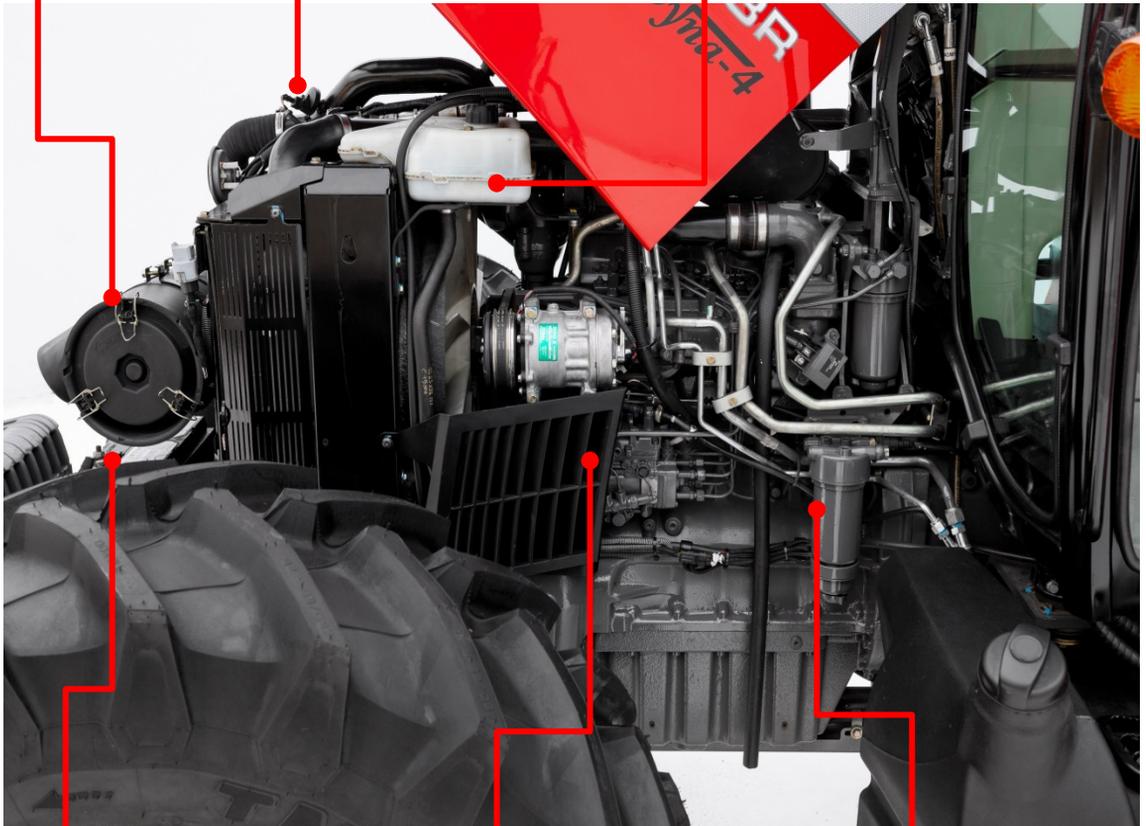
# Engine

## Engine Maintenance

Air flow sensor to detect blocked air filter

Transparent expansion tank for simple and convenient reading of the coolant level

Dry element air filter is fitted for simple and effective filtration



Easy access to main engine fuses

Removable maintenance ducts provide space for cleaning of radiators

Side mounted canister fuel filters for easy access during servicing

# Engine

---

## Fuel System

To ensure the availability of clean moisture free fuel, all **Massey Ferguson 6700R Series** tractors are fitted with two fuel filters. One of the filters is also fitted with a water separator to enable water and other contaminants to be captured from the fuel and regularly drained off. The fuel tank also contains a strainer fitted in the filler neck to catch any contaminants that may inadvertently fall into the tank while refuelling.

On all configurations the fuel tank, which is of plastic construction, is mounted on the left hand side of the tractor under the operator platform. A steel plate is fitted underneath the tank to provide protection to the tank from objects beneath the tractor.

A normal screw on fuel cap is standard specification with a lockable fuel cap available as an option through AGCO Parts Division.

The fuel filters are conveniently mounted on the left hand side of the engine. This allows easy access for maintenance and servicing.



# Engine

## Engine Specification

		<b>MF 6711R</b>	<b>MF 6712R</b>	<b>MF 6713R</b>
Type	Tier II	AGCO Power		
Model		AP44 DTIC2		
Emission Compliance		Tier 2		
Power @ rated engine speed	kW / hp*	83 / 112	91 / 122	98 / 132
Rated engine speed	revs/min	2200		
Max Torque		460	510	540
Engine Speed Max Torque	revs/min	1200		
Displacement	cc	4400		
Number of Cylinders		4		
Engine Aspiration		Turbocharged & Intercooled		
Air Filter		Dry – Dual Element with Aspiration		
Bore / Stroke	mm	108 / 120		
Injection System		Mechanical – Rotary Pump		
Cooling		Liquid		
Alternator	amps	120		
Starter motor	kW	3.2		
Fuel Capacity	litres	210		

\*ISO 14396



# Transmission

---

## Introduction

All **Massey Ferguson 6700R** Series tractors are specified with a Dyna-4 semi-powershift PowerShuttle transmission.

This transmission provides four powershift ratios in each of four robotised mechanical ranges providing 16 Forward and 16 Reverse speeds all operated without the need to use the tractor clutch pedal.

Powershift and range changes are made using the right hand console mounted transmission control lever.

Speedmatching is specified to ensure that the most appropriate powershift ratio is automatically selected when range changes are made to ensure smooth progress.

The PowerShuttle is operated by the unique MF Power Control lever which also provides an additional control for the powershift changes and a de-clutch facility for inching.

Shuttle progressiveness can also be adjusted to suit operator preference or application.

Dyna-4 provides a maximum speed of 40kmh subject to tyre specification and local market legislation.

Supercreep is available as a factory option providing minimum speeds down to 130 metres per hour at 2000 engine revs/min.

## Start Up

In the Dyna-4 transmission neutral is selected via the Power Control lever and there is no neutral position for the range or powershift elements.

On engine start up the transmission will automatically re-select the same range and powershift step that were engaged at the time the engine was stopped.

# Transmission

## Dyna-4

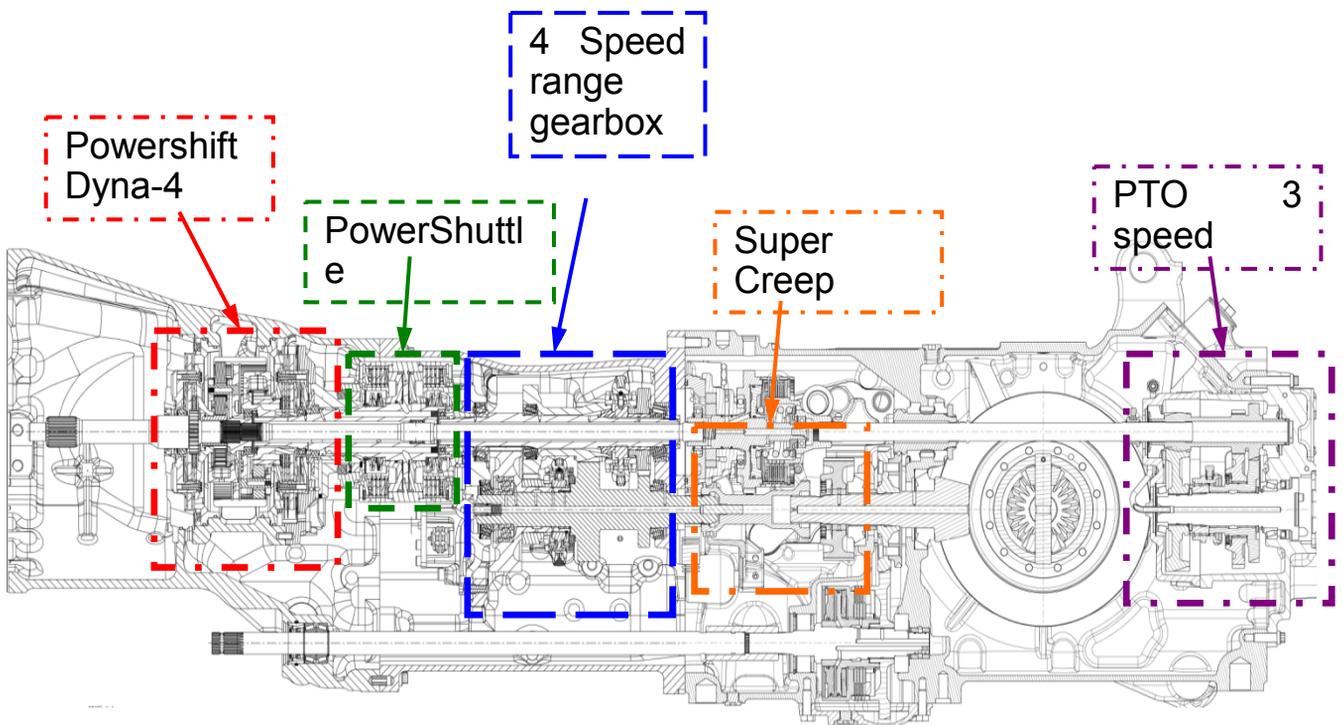
The Dyna-4 design consists of three main elements:

Four speed powershift unit

Forward / Reverse unit

Four speed mechanical range box

Supercreep and the PTO gears are mounted behind the main gearbox.



# Transmission

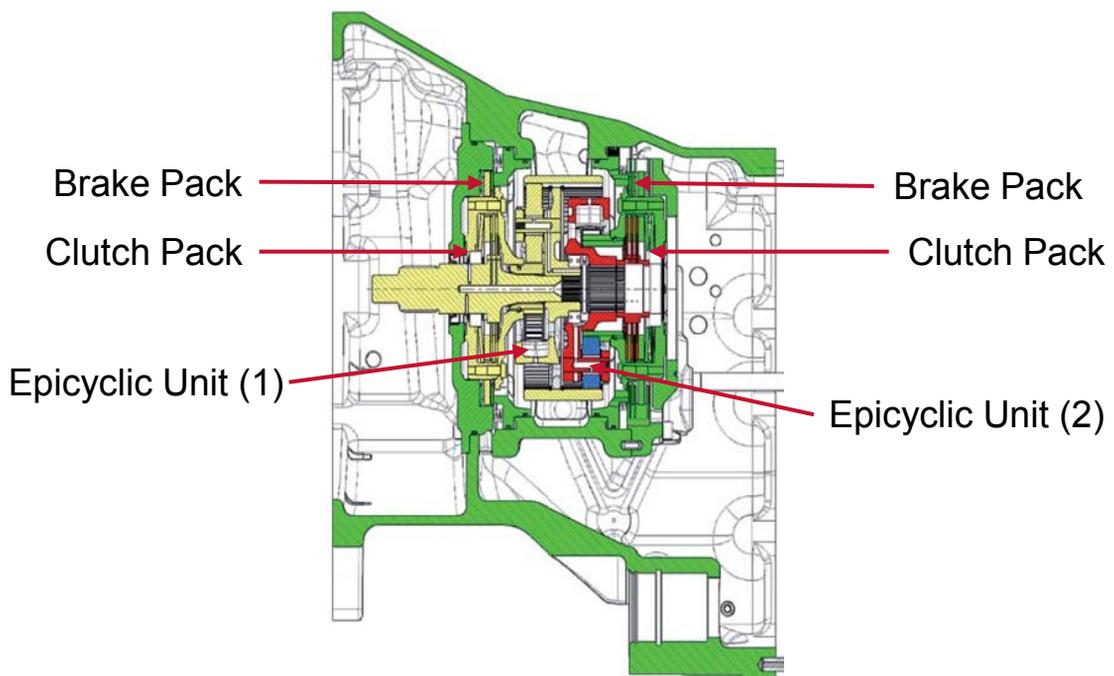
## Powershift Unit

The powershift unit is mounted in the front of the transmission housing and consists of two planetary epicyclic units controlled by a pair of hydraulic clutch packs and brake units.

Operated by proportional electro-hydraulic valves the various combinations of clutch and brake operation across the two epicyclic units provides the four powershift ratios.

The rate of ratio change is controlled by the Autotronic electronic control unit (ECU) which modulates the changes according to load and speed to ensure ratio changes are smooth and jerk free.

Upshifts provide approximately an 18.5% increase in forward speed, with downshifts providing approximately a 22% decrease in forward speed, increasing engine speed and torque.



# Transmission

## Forward / Reverse Unit

The forward and reverse unit is mounted in the central section of the transmission housing on the output shaft from the powershift unit.

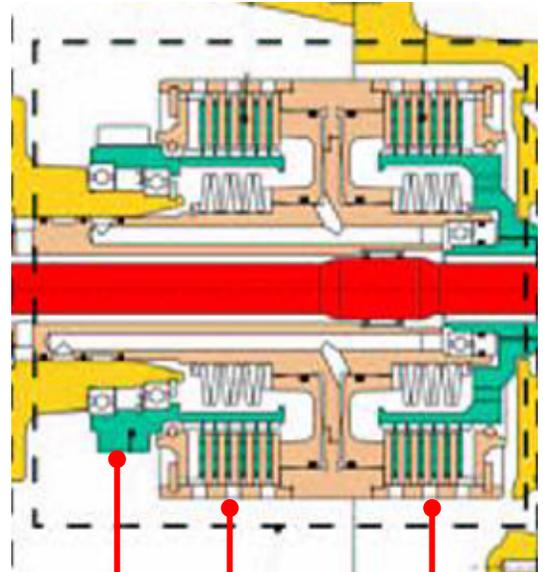
It consists of a pair of oil immersed multi-plate clutch assemblies, one for forward and one for reverse.

Engagement of the clutches is controlled by proportional electro-hydraulic valves through the Autotronic unit to ensure smooth and progressive direction changes.

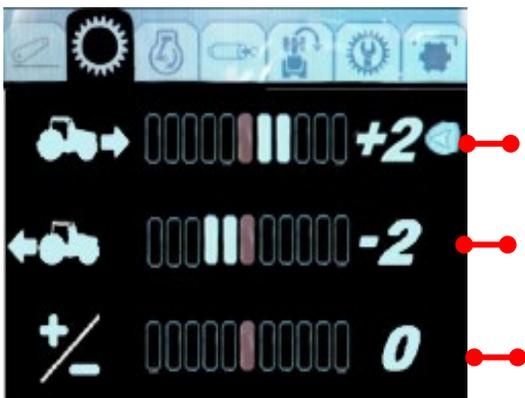
The progressiveness of these changes can be adjusted by the operator via the dot matrix screen mounted on the dash board.

In forward, drive is transmitted directly to the primary shaft of the range box, whereas in reverse the drive is transmitted via an idler gear and shaft to the range box main shaft.

All 16 gearbox speeds are available in forward and reverse and there is no significant difference between the forward and reverse speeds for each selected ratio.



Reverse Gear  
Reverse Clutch  
Forward Clutch



Forward sensitivity  
Reverse sensitivity  
Powershift change sensitivity

# Transmission

---

## Range Box

The four speed mechanical range box is mounted at the rear of the transmission housing taking its drive from the forward / reverse unit.

The four gear sets are helically cut for minimum noise and the two selectors are fully synchronised for easy engagement.

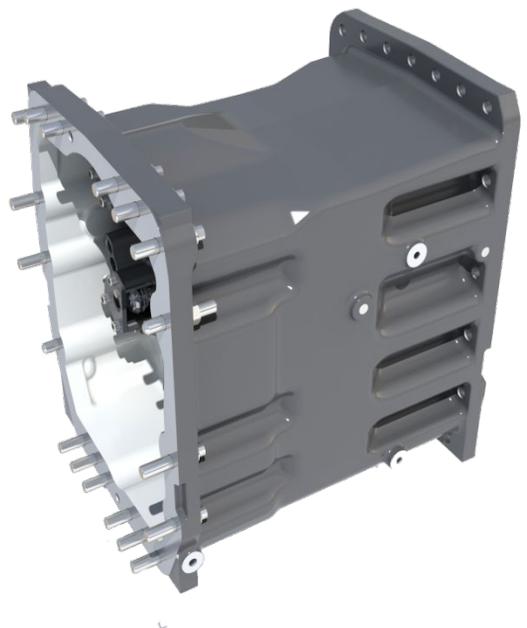
The operation of the range unit is fully robotised with the selectors operated by hydraulic cylinders on the selector rails.

These in turn are actuated electro-hydraulically and controlled by the Autotronic control unit.

Each range change is a mechanical action similar to that found in a fully mechanical gearbox and as such it is necessary for the transmission to be de-clutched during the range change.

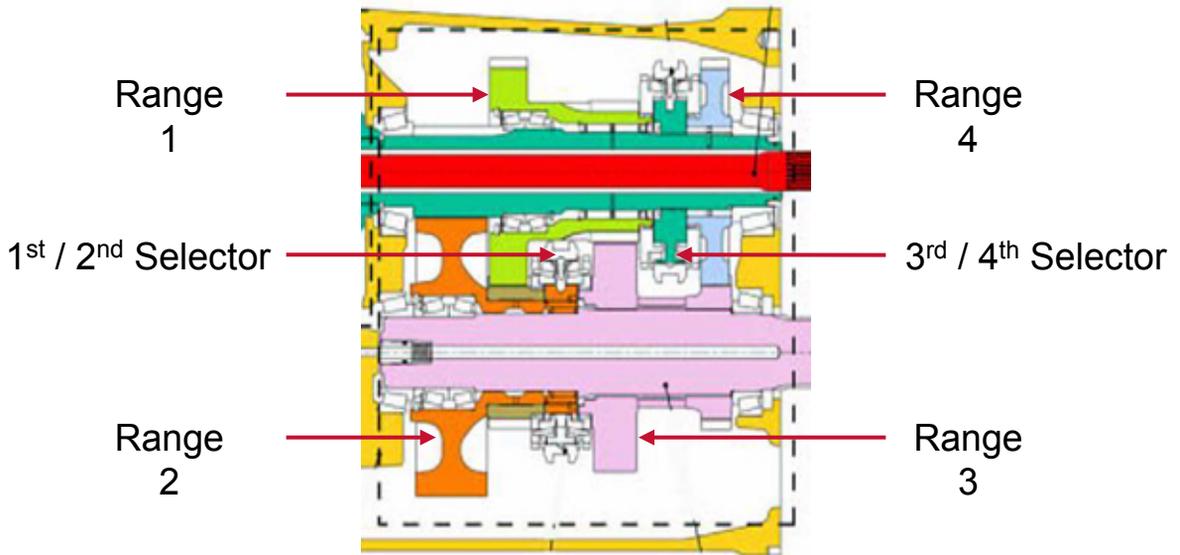
The de-clutching action takes place in the forward / reverse unit and is again controlled by the Autotronic control unit to ensure a smooth and progressive change.

During the range change the drive through the transmission is fully declutched and at this point the tractor can freewheel either gaining or losing speed dependant on the terrain and load on the tractor. In these circumstances, it may be necessary for the operator to also apply the brakes to prevent the tractor gaining excessive speed.



# Transmission

## Control



The **Dyna-4** transmission is simply controlled by the Power Control lever mounted on the left hand side of the steering column and the transmission control lever mounted on the right hand console.

All the functions of the transmission can be controlled without the need for the operator to depress the clutch pedal.

Information regarding the range selected and the powershift ratios is shown on the instrument panel.

Illuminated arrows on the instrument panel also show the direction of travel selected.

# Transmission

## Control continued



Power Control  
Lever

Transmission  
Control Lever

The unique **Massey Ferguson Power Control lever** is mounted on the left hand side of the steering column and provides the following functions :

- Control of the PowerShuttle for clutchless direction changes
- Control of the Powershift for clutchless and under load ratio changes
- A declutch facility for inching and manoeuvring

# Transmission

## Control continued

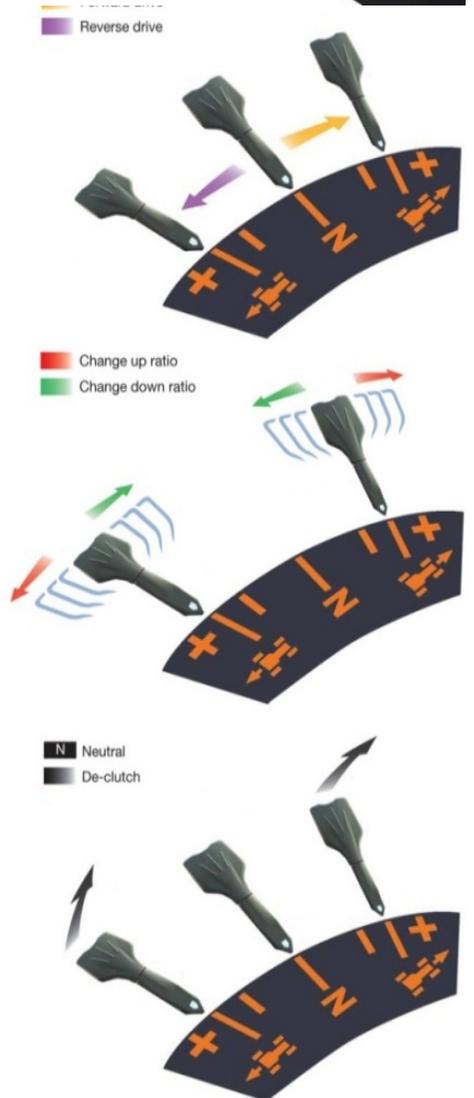
The functionality of the Power Control lever allows the operator freedom to control other tractor functions with the right hand (auxiliary valves, rear linkage, PTO etc) whilst maintaining full control of the transmission with the left hand.

Initial tractor start off is provided by moving the lever into either the forward or reverse segment of the quadrant; when a direction change is required the lever is moved easily into the opposite segment.

Once in the segment, 'pulsing' or holding the lever forward or backwards will increase or decrease the powershift ratios sequentially as required.

If the lever is lifted in any position across the quadrant the transmission is declutched; lowering the lever in the forward or reverse segments will re-engage the drive.

This allows the tractor to be manoeuvred precisely or brought to a standstill without the use of the clutch pedal.



# Transmission

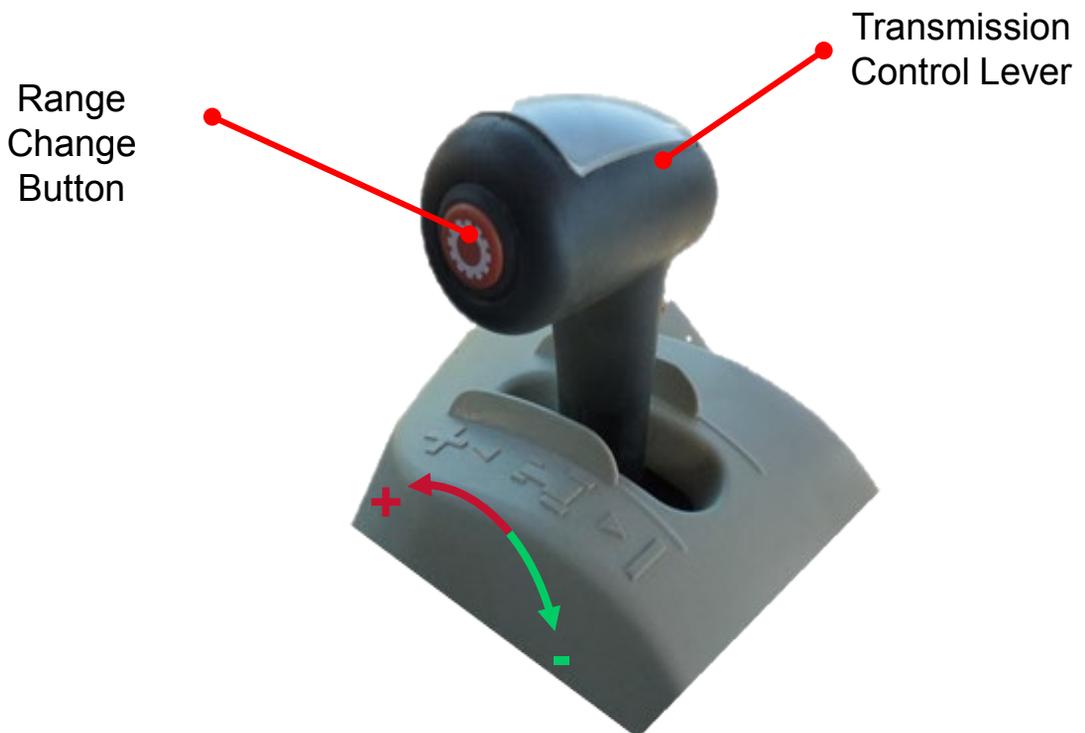
---

## Control continued

Mounted in a pod on the right hand console, additional transmission control is provided by the 'T' shaped transmission control lever.

The lever is moved forwards and backwards to provide powershift changes and, when the button on the left hand side of the lever is pressed, the same movement allows the operator to make range changes without using the clutch pedal.

Range changes are made sequentially either by 'pulsing' the lever or holding it in the '+' or '-' position.



# Transmission

## Control continued

The instrument panel displays both the selected direction of travel, the selected range and the selected powershift ratio.

Tractor direction is shown on the left hand information display with reverse shown in red and forward in green.

The selected range and the selected powershift ratio are shown in the left hand information screen.



# Transmission

## Control continued

### Pre-Select Start Speeds

The default start off range and powershift ratio for both forward and reverse travel can be defined by the operator to suit personal preference or the application / task being performed.

The chosen range / ratio are displayed in the Setup and Information Screen (SIS).



# Transmission

---

## **Control** continued

### **Speedmatching**

The **Dyna-4** transmission is specified as standard with Speed matching.

Speed matching provides automatic selection of the appropriate powershift ratio when a range change is made.

Using information from the transmission and engine speed sensors the Autotronic unit determines the appropriate powershift ratio to ensure a smooth and progressive speed change.

Speed matching operates automatically between all ranges, for both up shifts and down shifts, and completely independent of the current powershift ratio selected.

All ratio changes are made manually with the Transmission Control Lever

### **Brake to neutral**

The brake to neutral feature of the **Dyna-4** transmission specified for **MF 6700R Series** tractors allows the transmission to be temporarily placed in neutral when the brake pedal is pressed and re-engaged when the brake pedal is released.

This is a particularly useful feature for application where frequent stops are required, such as when using a round baler

This feature is automatically deactivated above 15 kph and reactivated when speed drops below 5 kph.

# Transmission

---

## Supercreeep

Supercreeep is available as a factory fitted option for **Massey Ferguson 6700R Series** tractors.

For use in specialist operations such as fine seed bed preparation, planting and harvesting of some specialist crops, supercreeep offers forward speeds as low as 0.15 kph at rated engine speed (subject to tyre size)..

Supercreeep is engaged electro-hydraulically by a rocker switch located on the right hand console.

A warning light illuminates on the dashboard to indicate when creep is engaged and it can only be engaged when the tractor is stationary

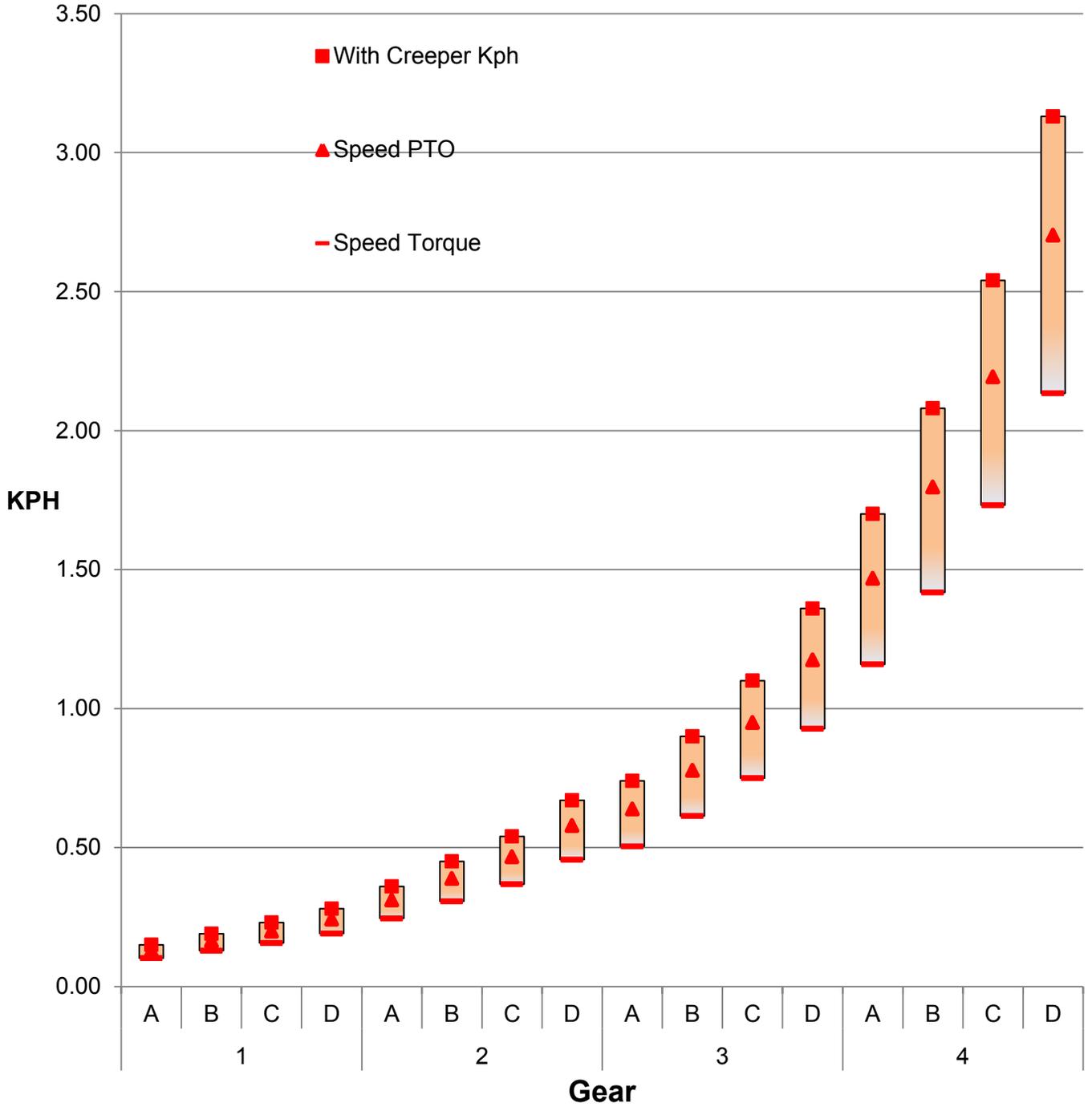
## Speeds

The Dyna-4 transmission provides 16 forward and 16 reverse ratios with speeds up to a maximum of 40km/h where permitted by local legislation. The design of the transmission ensures good gear overlap allowing the correct engine speed / travel speed to be obtained easily.

The sequential configuration, simple control layout and easy operation allow the operator to make ratio changes as and when appropriate allowing optimum use of the engine power and torque characteristics whilst minimising fuel consumption and optimising productivity. 8 of the 16 speeds are available in the typical field working range providing the most appropriate speed for a full range of applications.

# Transmission

## Speeds continued



# Rear Axle

---

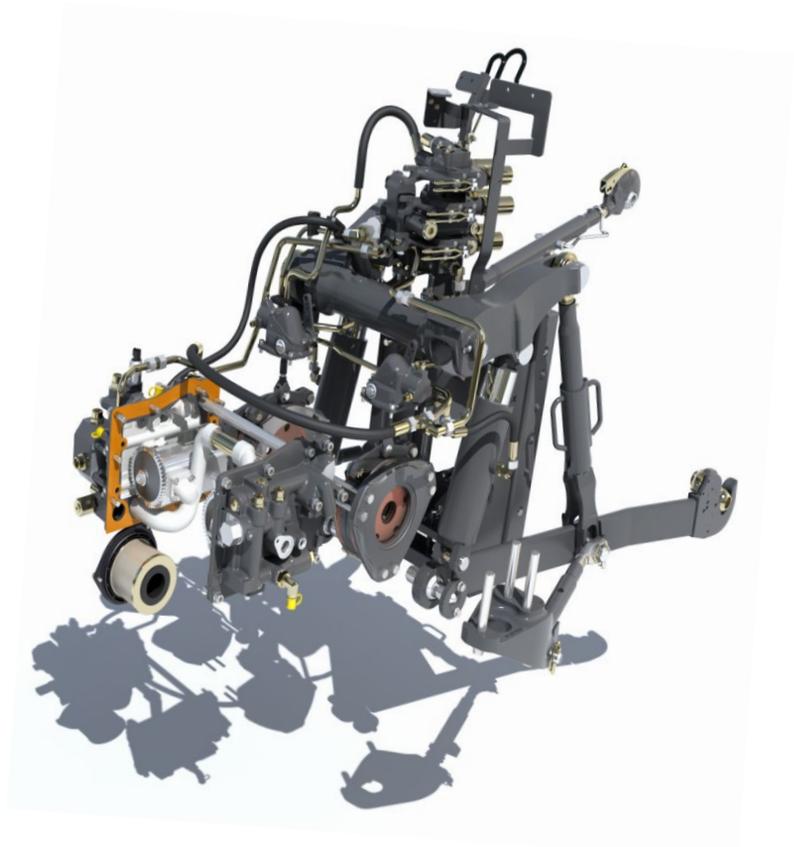
## Introduction

The **MF 6700R Series** use a specially designed transmission (GTA5050) to optimise the performance, and efficiency of the tractors.

The same heavy duty rear axle configuration is used across the range with the single piece rear axle centre housing forming an integral part of the structure of the tractor supporting the rear linkage lift components and axle trumpet housings.

Additionally the PTO clutch, PTO gears, 4WD clutch, handbrake and hydraulic pumps are also contained within the casing.

The heavy duty rear axle trumpet housings attached to the centre housing support the lower link arms and contain the brakes and epicyclic reduction units. The output shafts are specified with flanges for rear wheel mounting.



## Rear Axle

---

### Crown Wheel and Pinion / Differential

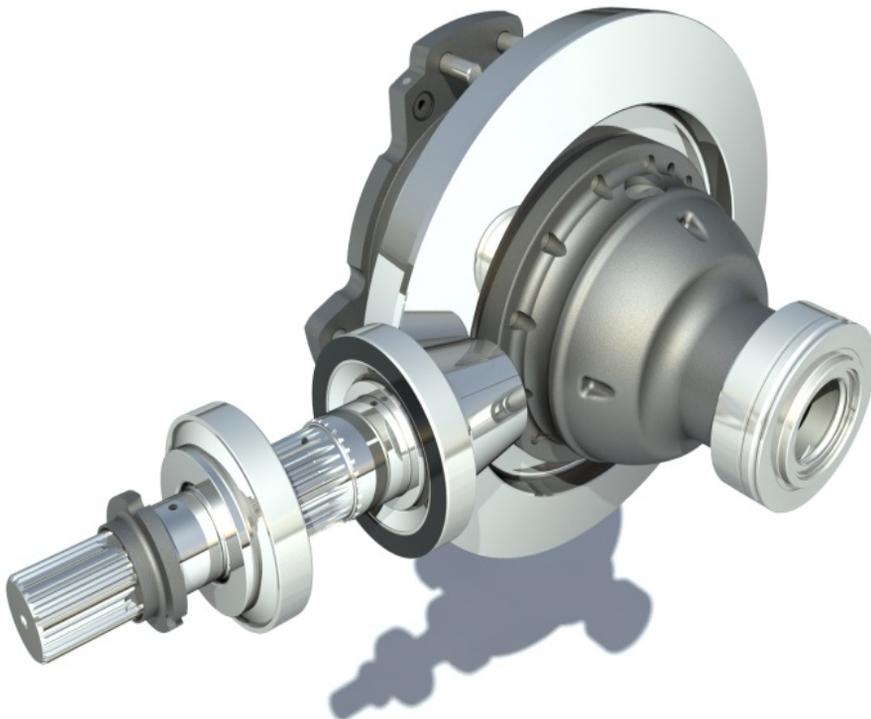
All **Massey Ferguson 6700R Series** tractors feature a heavy duty crown wheel and pinion and differential unit mounted in the rear axle centre housing.

The crown wheel and pinion assembly provides the initial transmission speed reduction whilst the differential unit distributes the drive to the rear wheels and allows differential speeds between the wheels when turning.

The complete assembly is mounted on heavy duty bearings to ensure reliability and longevity in arduous field conditions and haulage applications.

To maximise traction in field applications a differential lock is specified for all tractors.

**MF 6700R Series** are specified with a mechanical dog clutch rear differential lock whilst the Hydralock front differential lock provides true 4WD when required whilst allowing unrestricted differential operation when disengaged to minimise tyre wear and maximise manoeuvrability.



# Rear Axle

## Differential Lock

The differential lock is engaged electro-hydraulically and disengaged by spring pressure. Selection is either manual or automatic via soft touch buttons located on the right hand cab B-pillar.

In manual mode, the differential lock is manually engaged by the operator when required with temporary disengagement when the brake pedals are depressed and permanently disengaged if forward speed exceeds 20 kph or the operator presses the button a 2<sup>nd</sup> time.

Automatic engagement includes disengagement when the rear linkage is raised, and is re-engaged when the rear linkage is lowered.

Electro hydraulic actuation also engages the differential lock on the front axle giving true 4WD and can be engaged whilst the tractor is on the move or stationary.

Activation of the differential lock will also engage 4WD system if it has not already been engaged.



# Rear Axle

---

## Brakes

All tractors feature a pair of hydraulically actuated oil immersed disc brakes, one on either side of the tractor, acting on the output shaft from the rear differential to provide safe and secure stopping.

The 4WD clutch is automatically engaged during braking to provide four wheel braking and enhance safe stopping.

Operation of the handbrake provides mechanical actuation of an oil immersed multi-disc assembly mounted on the differential pinion shaft.

For extra security the 4WD clutch is also engaged when the handbrake is applied.



## Rear Axle

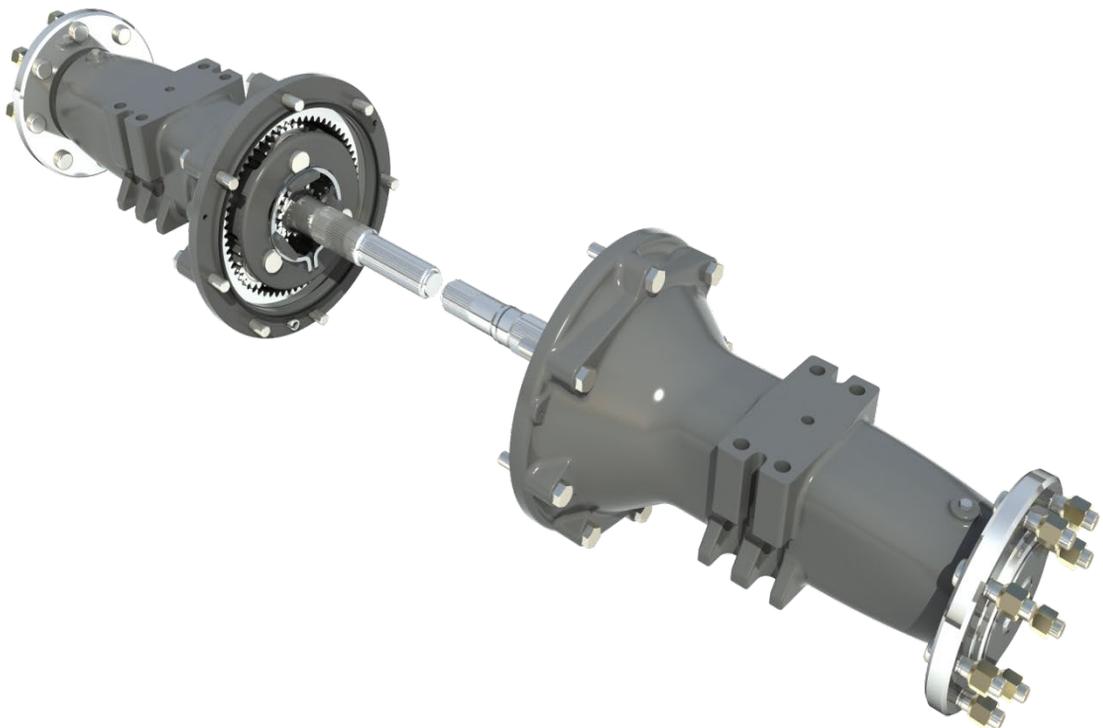
---

### Inboard Epicyclic Reduction Units

From the differential unit drive passes through the oil immersed brakes and on through the inboard epicyclic reduction units directly to the rear wheels.

The epicyclic reduction units are mounted at the inboard end of the rear axle trumpet housings and in addition to providing the final speed reduction / torque multiplication they also provide protection to the driveline from shock loads, cushioning any impact on the wheels caused by obstacles and rough terrain.

Each epicyclic reduction unit uses three pinion gears with a heavy duty carrier and bearings driving heavy duty drive shafts. A final reduction ratio of 5.36:1 ensures maximum power is transmitted with the minimum of stress on components.





# PTO

---

## Power Take Off (PTO)

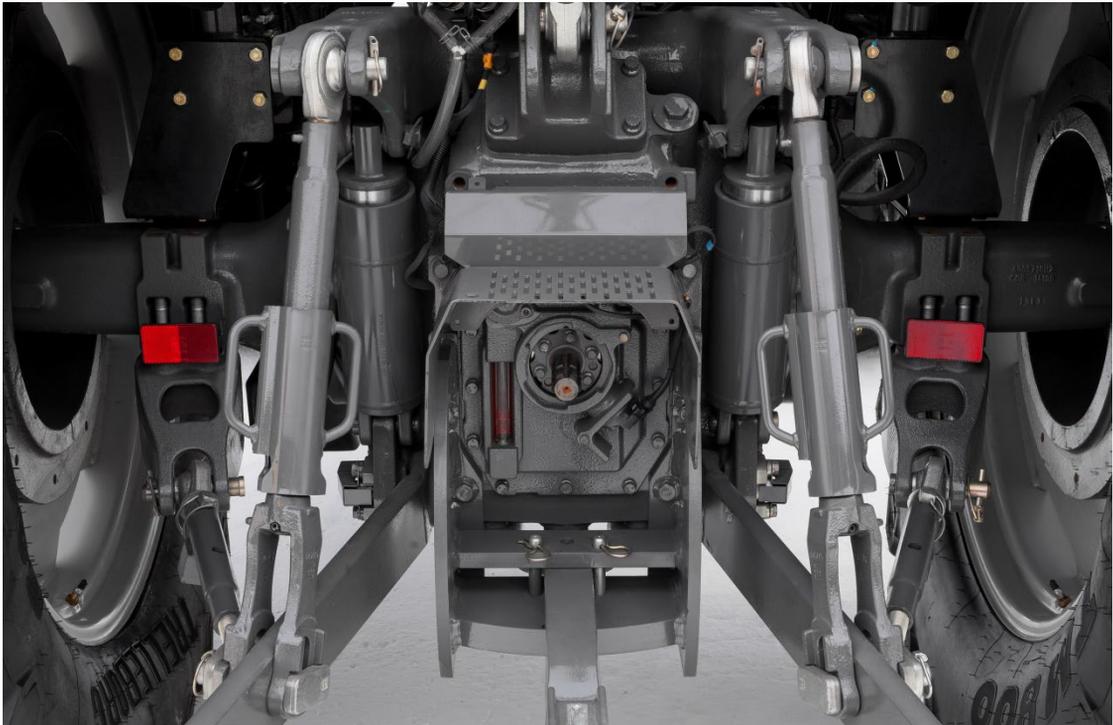
**MF 6700R Series** tractors are specified as standard with three speed PTO (540 / 540E / 1000 revs/min) with 35mm / 6 spline flanged output shaft and Independent PTO clutch (IPTO).

An additional 35mm / 21 Spline flanged output shaft is supplied with the tractors.

PTO Engagement is provided by an oil cooled multi-plate clutch pack which is controlled electro-hydraulically by a 3 position rocker switch.

Drive is taken directly from the engine flywheel to the IPTO clutch and then to the speed selection gears & output shaft in the rear PTO gear case.

Drive directly from the engine flywheel ensures minimal driveline power losses.



# PTO

## Power Take Off (PTO) continued

### Speed Selection

PTO speed selection is electro-hydraulic controlled by a soft touch keypad located on the cab right hand B pillar.

### Automation

All models feature PTO automation which disengages and engages the PTO drive with the rear linkage operation.

Automatic operation is selected by first engaging the PTO drive and then pressing the AUTO button located next to the PTO rocker switch.

The PTO drive will then automatically disengage when the rear linkage is raised, and re-engaged when the rear linkage is lowered.



# Front Axle

---

## Introduction

The **Massey Ferguson 6700R Series** tractors are specified with a driven front axle (4WD) as standard providing enhanced traction, greater stability and improved steering accuracy on loose surfaces.

Front axles are specified with 55° steering angle and minimal castor angles maximising traction with minimal tyre wear, providing enhanced manoeuvrability.

Heavy duty final drives provides efficient power transmission to the ground with reduced



## Front Axle

---

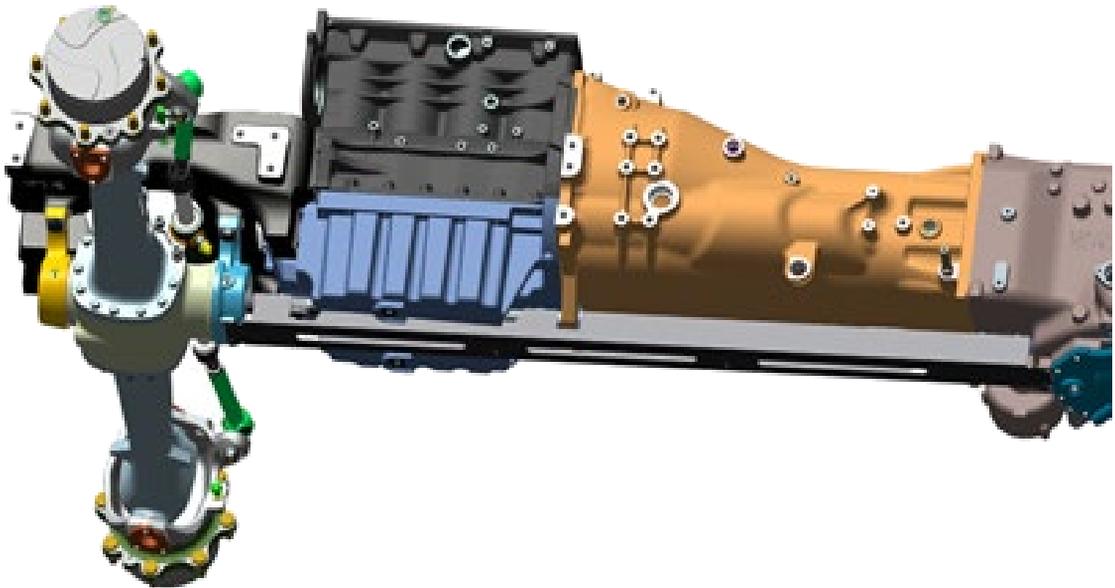
### Four Wheel Drive Driveline

The configuration features a centre mounted drive shaft for enhanced driveline reliability and ground clearance whilst maximising manoeuvrability through unrestricted front wheel turning angles and axle oscillation. A crop guard prevents crop debris wrapping around the drive shaft during operation.

A multi-plate oil immersed clutch unit engages the drive, the clutch is applied by spring pressure and released by hydraulic pressure and is controlled electro-hydraulically by a switch on the cab B pillar

This configuration ensures that four wheel braking is maintained even if hydraulic oil pressure is lost.

4WD is automatically engaged when the differential lock is activated, during braking and also when the hand brake is applied.



Four wheel drive should only be used in field environments where additional traction is required, it should not be used on the highway. Four wheel drive should not be engaged when there is differential speeds between the front and rear wheels.

# Front Axle

## Steering

Hydrostatic steering through a balanced steering cylinder with a maximum 55° steering angle (subject to tyre size and track settings) provides excellent manoeuvrability amongst buildings and on field headlands. The steering ram is mounted to the rear of the axle protecting it and the steering ball joints should have no obstructions strike the axle.

Minimal castor angles enhance traction, reduce tyre wear and minimise ground disturbance when turning.

The axle oscillates 11° maintaining traction, stability and steering control in difficult ground conditions. Minimum caster angles enhance traction, reduce tyre wear and minimise ground surface disturbance when turning.

Heavy duty hubs and pivot bearings with epicyclic reduction units are common to all axles ensuring reliable and dependable performance in the most arduous of conditions.



55° steering angle



11° axle oscillation

# Front Axle

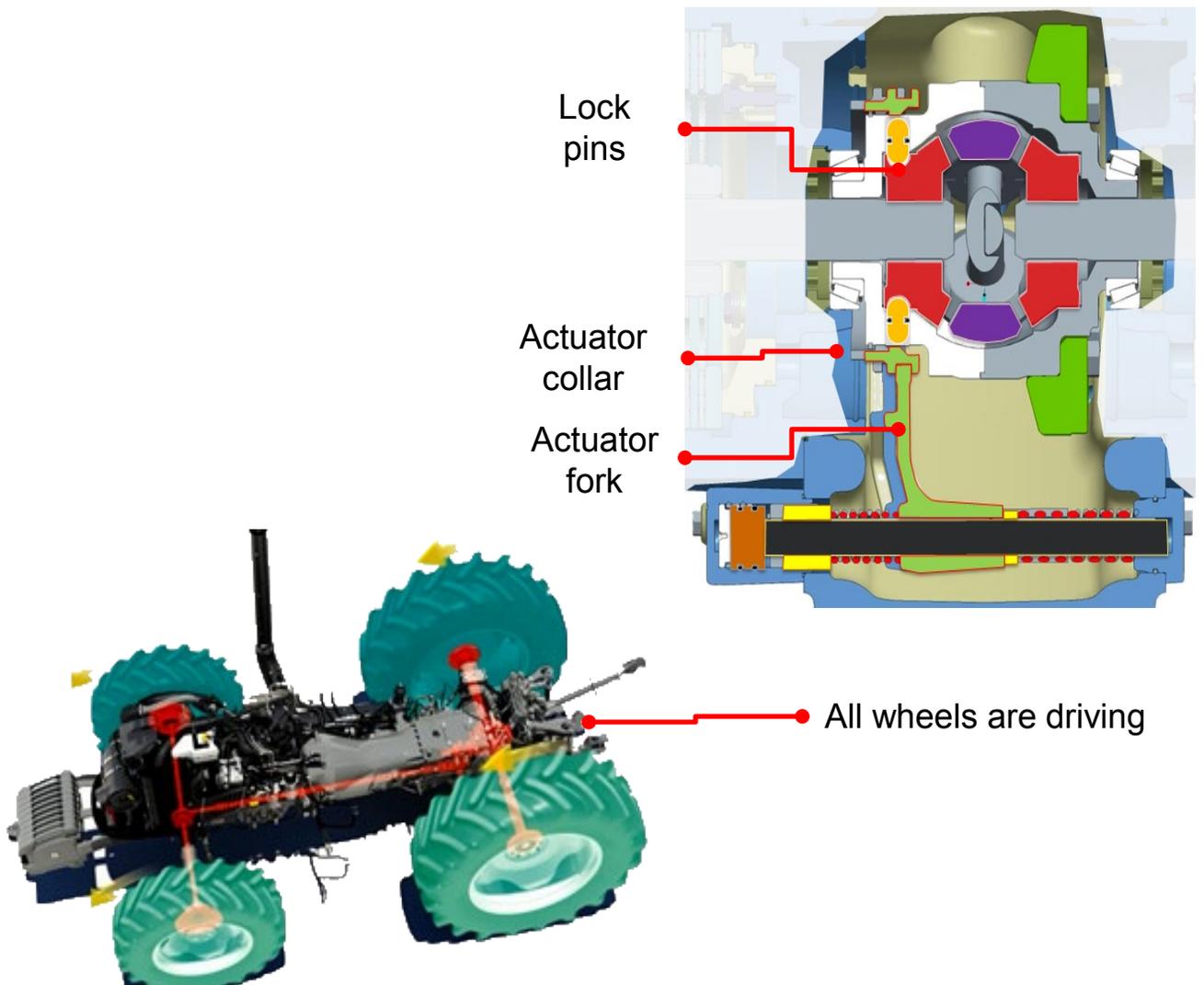
## Hydralock

The 4WD front axle is fitted with Hydralock, a hydraulically locking differential which is automatically engaged with the rear differential lock providing true 4WD when required.

The system is engaged electro-hydraulically and simultaneously with the rear differential lock by a switch on the operator's right hand console. A warning light illuminates on the instrument panel when differential lock is engaged.

Differential lock should not be engaged when there is a high differential speed between the left hand and right hand wheels.

Engaging the differential lock automatically engages the 4WD clutch where specified.



# Hydraulics

---

## Introduction

The hydraulic system is key to the ability of a tractor to meet the needs of today's modern implements and agricultural practices.

The system needs to provide oil to operate many of the tractors internal functions such as clutch packs, steering, brakes, lubrication and cooling.

Alongside these requirements modern tractors have high capacity rear linkage systems, multiple auxiliary hydraulic valves and potentially front linkage and / or front loader.

The constant evolution of modern agricultural implements generates an ever increasing demand for tractor hydraulic systems with high pressure and flow for the operation of hydraulic cylinders, braking systems and hydraulic motors.

**Massey Ferguson** tractors have always been specified with hydraulic systems that use the latest technology to meet these demands whilst maximising efficiency and providing a range of specific options to meet customer requirements.

The **Massey Ferguson 6700R Series** are no exception with a closed centre 110 l/min system, and up to three rear auxiliary valves supplied from factory.



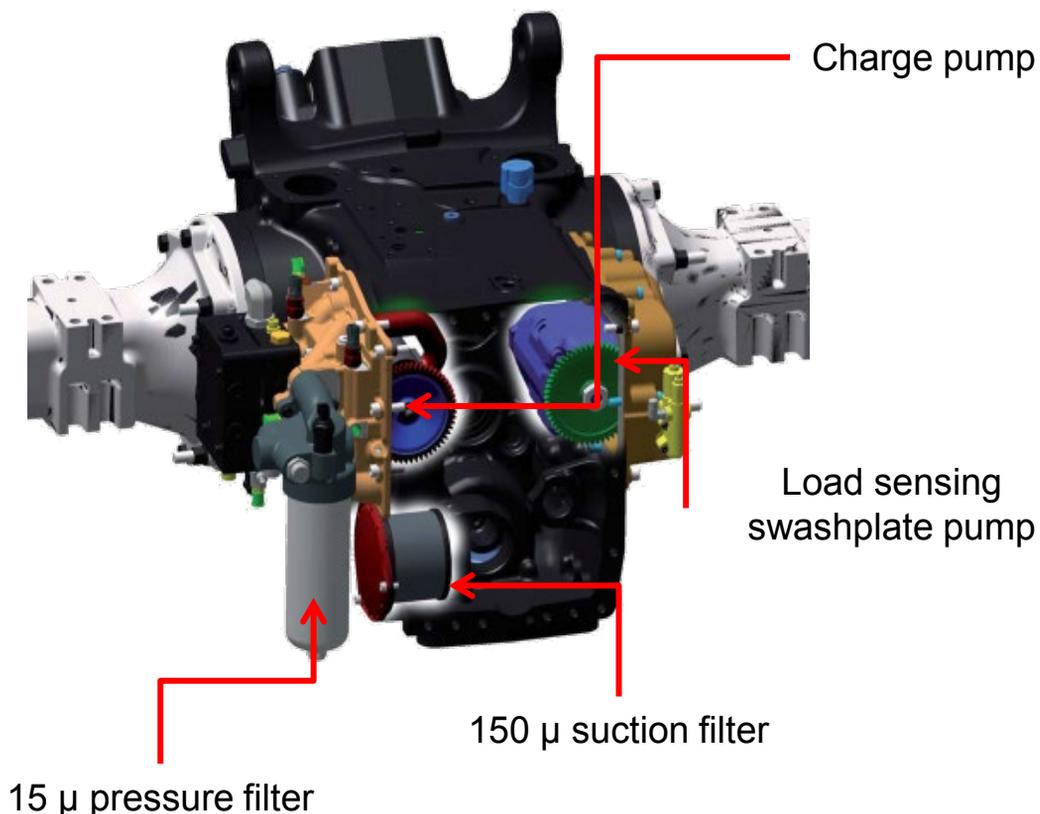
## Closed Centre Load Sensing (CCLS) System

The CCLS hydraulic system uses a variable displacement (swash plate) hydraulic pump controlled by a load sensing system which accurately controls the output of the pump, both pressure and flow (up to the maximum available), to precisely match demand. This means that a large capacity pump can be specified which only provides flow and pressure when required minimising parasitic losses and reducing fuel consumption.

The load sensing system senses when additional flow is required and regulates the pump output to ensure that the correct flow is provided on demand.

The system has two pumps, the charge pump located on the right hand side of the rear axle, and the variable displacement swash plate pump mounted on the left hand side.

In addition to ensuring that the main swashplate pump is supplied with oil to meet changes in demand, the charge pump also provides oil for the low pressure circuit responsible for operation of the Dyna-4 transmission, 4WD, PTO, Differential Lock, steering, brakes and internal lubrication.



# Hydraulics

## CCLS Auxiliary Distributor Valves

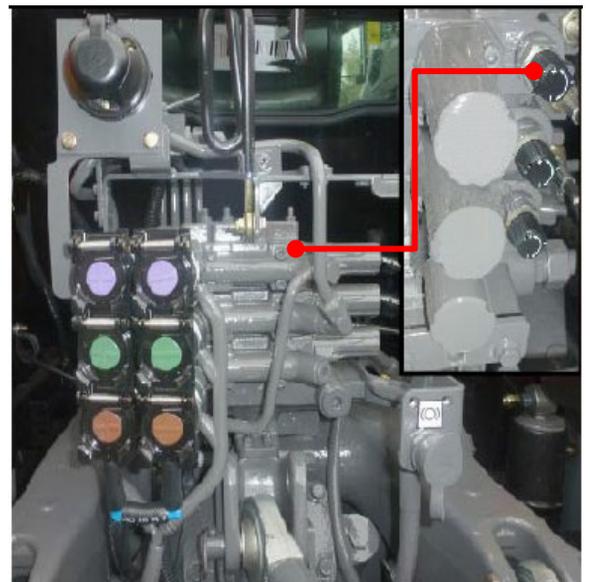
The **Massey Ferguson 6700R Series** are specified in base with two auxiliary hydraulic valves, with a third valve available as a factory option. All valves are double acting with 4 position including Float, Kick out and Zero Leak.

All valves are load sensing and can operate both single and double acting services.

The distributors feature mechanically operation with the controls located on the console to the right of the operator. The levers have mechanical locks allowing the lever to be set in neutral or constant pumping should this be required.

All distributors have manual flow adjustment allowing the operator to vary the oil flow to suit the required application through a control mounted on each valve.

The female couplers are fitted as standard with oil collectors reducing the likelihood of oil contamination when connecting or disconnecting implement hoses.





# Rear Linkage

---

## Introduction

**Massey Ferguson 6700R Series** tractors are specified with two 85mm external lift cylinders giving a 5200 kg maximum lift capacity.

The use of two external lift cylinders maximises the lift capacity on each tractor whilst reducing the complexity of the rear axle centre housing.

All **Massey Ferguson 6700R Series** tractors are fitted with category III rear linkage with category II fixed ball ends. All models have fully adjustable lift rods with a float position. An adjustable top link with ball ends is also supplied.

Standard specification includes adjustable telescopic stabilisers.



# Rear Linkage

## Controls

**Massey Ferguson 6700R Series** tractors are specified with ELC (Electronic Linkage Control). Draft sensing is via the lower links, with sensing pins mounting the lower link arms to the rear axle of the tractor

ELC is the most advanced and reliable control system for the operation of tractor rear linkage and was pioneered by **Massey Ferguson** over 35 years ago.

ELC provides precise and accurate linkage control in both position and draft applications whilst overcoming many of the deficiencies of a mechanical control system. As the link between the various components of the control system is electronic rather than mechanical, ELC is able to react more quickly and more accurately to changing draft forces with soil engaging implements maintaining traction, improving implement depth control and enhancing productivity. System reliability is enhanced by the absence of any mechanical control linkage to wear and require adjustment.

The system features push button operation for lift, lower and neutral functions.

The depth / height potentiometer is next to the lift / lower switches for straightforward adjustment.

Rear linkage lift lower buttons



Linkage Depth/Height control

# Rear Linkage

## Controls continued

In addition to the lift / lower and the depth / height controls an ELC Control Panel is located on the cab right hand B-pillar and contains potentiometers to set up parameters for linkage operation.

### Position / Intermix / Draft Control (A)

This control allows the linkage functions to be set according to the configuration and type of implement.

For non-soil engaging implements Position control is selected.

For soil engaging implements Draft control is selected.

Between Position and Draft, Intermix allows the responsiveness of the draft control to be adjusted according to implement configuration, soil type and ground conditions.

### Rate of Lowering Control (B)

This control allows the rate of drop of the rear linkage to be adjusted for optimum safety and control when using fully mounted implements.

There is also a lock position for the safe transport of mounted implements.



# Rear Linkage

## Controls continued

### Diagnostic Lights (F)

The diagnostic light indicates the status of the linkage (active / inactive) and advises of any system faults.

### Lifting / Lowering Indicator Lights (E)

The lift and lower lights provide a visual indication of the operation of the draft control and allows precise adjustments to be made to maximise weight transfer and ensure accurate depth control.

### Active Transport Control (D)

Active Transport Control provides shock absorption for the rear linkage during transport of heavy implements.

This protects the tractor and implement from shock loads, improves operator comfort and allows faster transport speeds over rough terrain.

### Lift Height Control (C)

The lift height control allows adjustment of the maximum lift height of the rear linkage to protect PTO drive shafts and prevent contact between mounted implements and the tractor.



# Rear Linkage

---

## Controls continued

### Quick Soil Engage

The linkage lift lower switch incorporates a quick soil engage function. To use the quick soil engage function the operator presses the button to lower the linkage. Once the implement is in contact with the ground pressing and holding the lower linkage button will engage the quick soil engage feature.

The linkage ECU prevents the implement from dropping until it has sensed the implement is on the ground preventing damage and easing operator load. On entering work the linkage settings are overridden allowing the implement to quickly reach working depth. Releasing the button re-engages the draft control and the implement returns to the depth set by the operator.

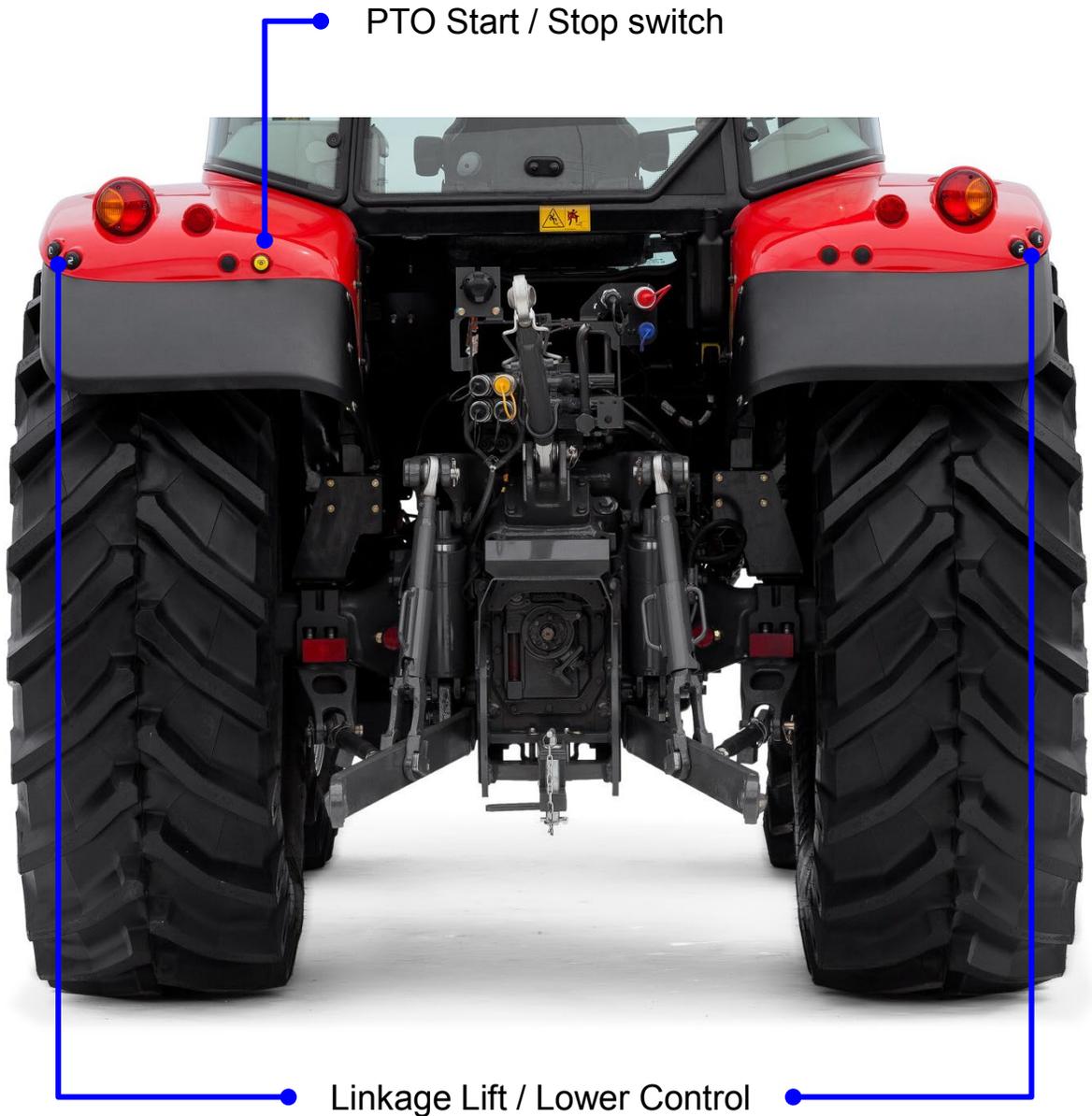
Press and hold  
lower linkage  
button



## Rear Linkage

### Controls continued

To aid the hitching & unhitching of implements **MF 6700R Series** are specified with fender mounted external controls for the rear linkage lift / lower and PTO start / stop.



# Operator Environment

---

## Introduction

**Massey Ferguson 6700R Series** tractors are specified as standard with a flat floor cab with single left hand entry door.

The cab features a class leading noise level of only 71dBA for enhanced operator comfort and is easily accessed from the left hand side using the A-pillar mounted handrail and wide self cleaning steps.

The cab frame features slim pillars giving minimal visual impact for the operator.

Strategically positioned B & C pillars and large side & rear three quarter opening windows provide unobstructed visibility through 5.8m<sup>2</sup> of glass.

All models are fitted as standard with heating and air conditioning.



# Operator Environment

---

## Introduction continued

All the major controls (hand-throttle, handbrake, gear levers, shuttle etc.) are mounted in the most ergonomic position.

The semi power-shift gearbox T-bar control is mounted to the right of the operator with the handbrake located to the left

The auxiliary hydraulic valve control levers are within easy reach located on the right hand console to the right of the Electronic Linkage Control (ELC) lift lower buttons and adjacent to the hand throttle control.

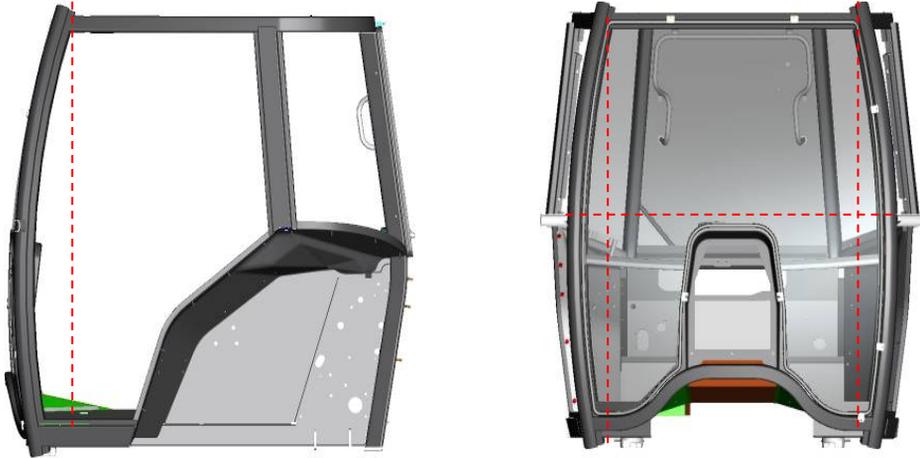
Control switches for the 4WD and differential lock are located on the right hand cab B-pillar with the PTO controls located just below .

Large fully adjustable external mirrors are part of the standard configuration.



# Operator Environment

## Structure



The front windscreen is curved both vertically and horizontally to provide better visibility and interior space



Door handle (inside and outside the cab)



Handrail and side light installation



Pendent suspended pedals

# Operator Environment

---

## Interior

The cab features a flat floor with pendant mounted clutch, brake pedals and foot throttle giving unobstructed access. The interior trim provides a light and welcoming environment and the floor is covered with an easy cleaning rubber mat helping to reduce noise and enhance comfort

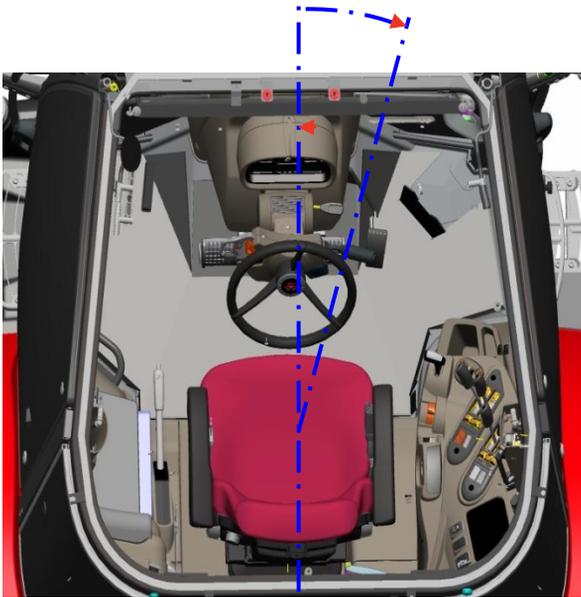


# Operator Environment

## Operator Seat

A cloth covered mechanical suspension seat with arm rests, lumbar adjustment and seat belt is standard specification for **Massey Ferguson 6700R Series**.

The armrests are both height adjustable and the seat can swivel 20° left and right of the normal driving position.



An operator presence safety switch is part of the standard configuration to prevent the tractor from being started without the operator sitting in the seat. It also prevents the PTO from being engaged or disengages the PTO if the operator leaves the seat when the handbrake is not applied.

## Auxiliary Seat

As standard all models are specified with an auxiliary seat with seat belt.



# Operator Environment

## Operator Seat continued



Arm rest adjustment

Seat back adjustment

Seat angle adjustment

Fore/aft adjustment

Weight adjustment



Lumber adjustment

Operator manual storage pocket

# Operator Environment

## Roof

The higher external panel and the headlining of the standard roof are moulded to optimise operator head room for maximum comfort and can be specified with either the standard or low position cab.



Vents for the heater / blower or optional air conditioning are distributed across the front of the headlining.

Heater / blower and air conditioning control are mounted adjacent to the recirculation control and audio equipment mounting aperture.

Speakers for audio equipment are mounted at the rear.

There is a cool box located on the top right hand side of the cab. It is refrigerated by its own duct directly from the air conditioning system



# Operator Environment

## Ventilation

The cab features opening rear and side windows.



Air conditioning along with a pressurised heater / blower system with 4 speed fan, recirculation control and external filtration is part of the standard specification.



The air is distributed via 9 cab vents located in the cab roof.



Cab filters are mounted externally to allow easy service access.



# Operator Environment



# Operator Environment

---

## Storage

Beverage and document storage are also provided ensuring the cabin can be kept clear of clutter.

A cool box is provided to the right of the operator in the cab roof.



Drinks holder



Storage Pocket



Storage tray



Storage Holder



Instruction manual pocket



Cool box

# Electrical System

## Introduction

**Massey Ferguson 6700R Series** tractors are fitted with a 12 volt / 105 Amp hour battery located at in front of the cooling package under the engine hood

An 120 Amp alternator keeps the battery charged and provides power for auxiliary requirements.

A grid heater is fitted in the inlet system to provide starting assistance in low temperatures.

In addition to full highway lighting the tractors feature front and rear work lights located on the cab roof.

A fuse box is located under the bonnet next to the battery protecting the major electrical circuits for the engine, with the main fuse box located behind and to the rear of the operator in the operator cab.



Engine Fuses



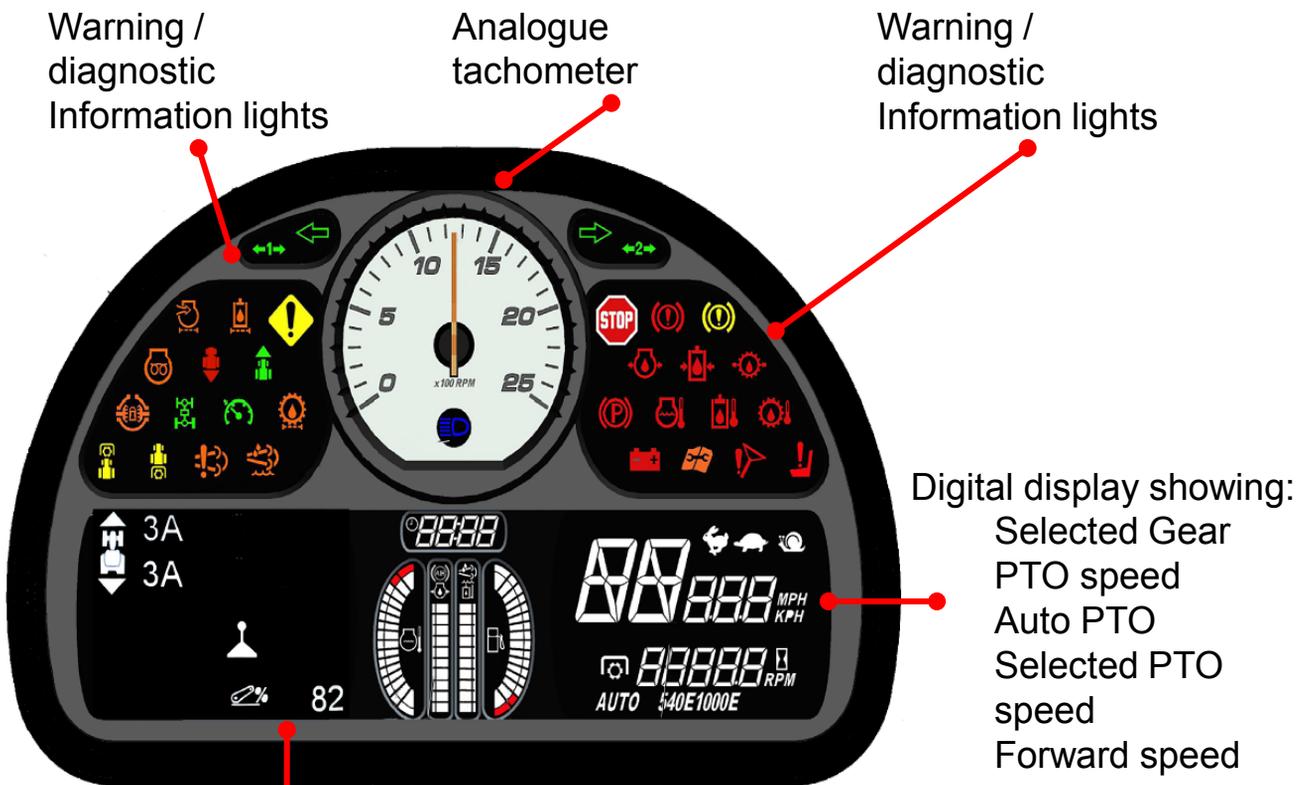
Fuses & relays in operator cab

# Electrical System

## Instrumentation

Information on tractor performance, status and diagnostics is provided through a analogue / digital instrument panel.

The instrument panel has a range of warning lights advising the operator on the operating status and items requiring attention.



Digital display showing:  
Start off gears (Fwd / Rev)  
Brake to Neutral  
Linkage position  
Area worked  
Tractor setup\*



\* In conjunction with the with soft touch keypad located to the right hand side of the steering column

# Wheels and Tyres

## Introduction

**Massey Ferguson 6700R Series** are specified as standard with Trelleborg radial tyres.

		<b>MF 6711R</b>	<b>MF 6712R</b>	<b>MF 6713R</b>
Wheel Type	Front	Pressed Steel Adjustable		
Tyre Brand / Type	Front	Trelleborg TM600		
Tyre Size	Front	380/85R28		
Wheel Type	Rear	Pressed Steel Adjustable		
Tyre Brand / Type	Rear	Trelleborg TM600		
Tyre Size	Rear	460/85R38		

Radial tyres bring many benefits not offered by cross-ply tyres, enhancing performance in both tractive and haulage applications whilst improving operator comfort and reducing soil compaction. A description of the differences between cross-ply and radial tyres is given on the next page.



# Wheels and Tyres

---

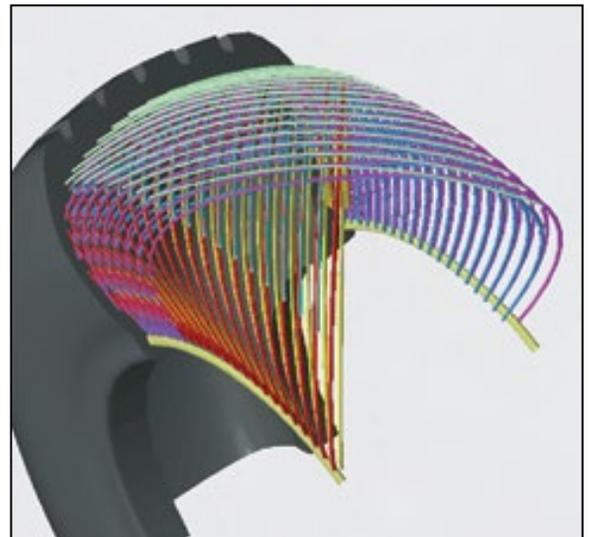
## Cross-ply and Radial Tyres

Historically cross-ply tyres were specified for many **Massey Ferguson** tractors below 100kW (135hp), however, **Massey Ferguson Global Series** tractors, including **MF 6700R Series** are specified with radial tyres (except for the front tyres on 2WD versions). Although cross-ply and radial tyres look very similar, there are large differences in the construction of these tyre types which affect the machines performance in the field.

### Cross-ply Tyre Construction

Cross-ply tyres are constructed of numerous layers of cords which cross in alternating directions from one side to the other to form the tyre. The tread and sidewall rubber are attached directly to the casing, making both the tread and sidewall act as one.

A cross-ply tyre is normally constructed of between four and ten layers of textile plies. The number of layers is known as the 'ply tyre'. The plies are stacked on top of each other and there is no clear distinction between the sidewall and the tread construction. This construction gives very good sidewall strength and gives good lateral stability.



However, this construction also means that the tread and sidewalls work as one element. As the tyre rolls through the contact path and deflects, the flexing in the sidewall is transmitted to the tread causing the lugs to move and squirm. This movement causes loss of traction and increases the rolling resistance leading to increased fuel consumption and working time.

# Wheels and Tyres

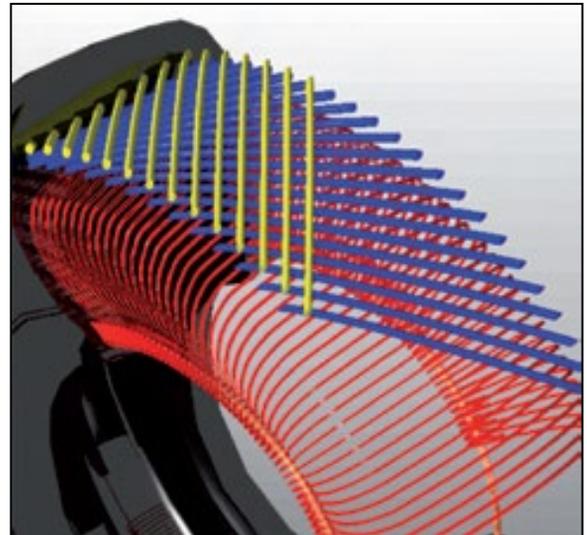
## Cross-ply and Radial Tyres continued

### Radial Tyre Construction

Radial tyres are made of 2 - 4 layers of strong and flexible cords which run around the tyre in layers. Stabilising crown belts are attached to the circumference of the radial casing. The tread rubber is then attached to the crown belts. Flexing of the casing is not transmitted to the tread, even under extreme circumstances, meaning that the sidewalls and tread work as separate elements. A radial tyre can also be operated at a lower pressure giving a larger footprint for the same equivalent tyre size.

As the sidewalls and tread operate as separate elements the tread pattern remains consistent as the tyre rotates. This coupled with reduced tyre pressure leads to a reduced tyre wear, increased tyre life, reduced soil damage and reduced working time.

Although radial tyres have many benefits their construction does mean that the side walls are susceptible to damage in very rough terrain and on uneven surfaces such as those found in forestry and land clearance applications.



The table below shows the potential savings that can be made when radial tyres are used in place of cross-ply tyres.

Ploughing an area of 70ha with an 85hp (63 kW) tractor and a 14 inch 3 furrow plough			
Tyre Type	Radial Tyres	Cross-ply	Saving
Working Time	133 hours	152 hours	19 working hours
Fuel Consumption	1,862 litres	2,128 litres	266 litres of diesel

Source: 2013 / 2014 Tyre Technical Data Book, Michelin Agriculture and Compact Line, Michelin

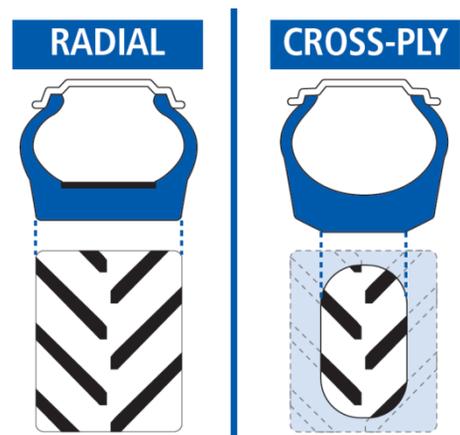
# Wheels and Tyres

## Cross-ply and Radial Tyres continued

### Radial Tyre Benefits

- **Increase profitability**
  - Time savings
  - Lower fuel consumption
  - Increased service life
- **Great productivity**
  - Longer, wider footprint
  - Less rutting
  - Less soil compaction
  - Better crop yield
- **Increased comfort**
  - Flexible casing
  - Better absorption of vibrations
  - More steering comfort
  - Protection of mechanical components
- **More traction**
  - More regular forward progress of the tyre
  - More tread lugs on the ground
  - Better self-cleaning

Radial tyres give a 30% increase in footprint compared to a cross-ply tyre of equivalent size.



### Important Additional Information

In order to maximise the potential performance benefits of radial tyres it is crucial that:

- The manufacturers recommended tyre pressures (dependent on loading and application) are adhered to
- Under no circumstances should radial tyres be ballasted with water

# Technology

## AutoGuide

To meet the increasing demand for precision farming technology all **Massey Ferguson 6700R Series** can be specified with the factory option of AutoGuide ready.

This configuration equips the tractor with the various components, including the electro-hydraulic steering valve, wheel angle sensors, harnesses, etc. to allow the installation of an aftermarket guidance system.

This AutoGuide ready configuration allows the customer to install the most appropriate guidance system to achieve the level of accuracy and technology required whilst ensuring good correction signal reliability and aftermarket support are available in the market where the tractor will operate.





# Specifications

## Engine

		<b>MF 6711R</b>	<b>MF 6712R</b>	<b>MF 6713R</b>
Type	Tier II	AGCO Power		
Model		AP44 DTIC2		
Emission Compliance		Tier 2		
Power @ rated engine speed	kW / hp*	83 / 112	91 / 122	98 / 132
Rated engine speed	revs/min	2200		
Max Torque		460	510	540
Engine Speed Max Torque	revs/min	1200		
Displacement	cc	4400		
Number of Cylinders		4		
Engine Aspiration		Turbocharged & Intercooled		
Air Filter		Dry – Dual Element with Aspiration		
Bore / Stroke	mm	108 / 120		
Injection System		Mechanical – Rotary Pump		
Cooling		Liquid		
Alternator	amps	120		
Starter motor	kW	3.2		
Fuel Capacity	litres	210		

\*ISO 14396

# Specifications

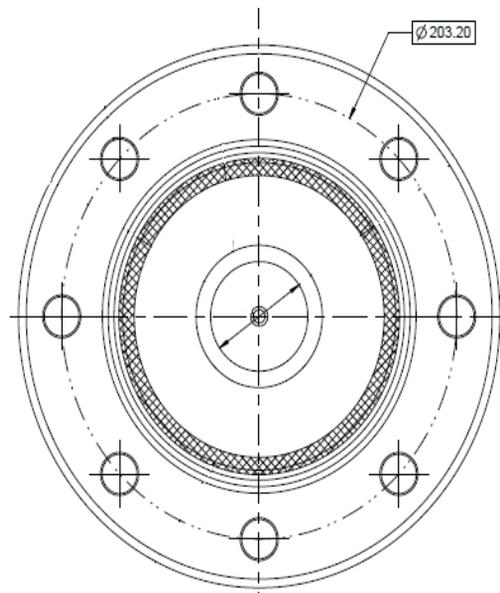
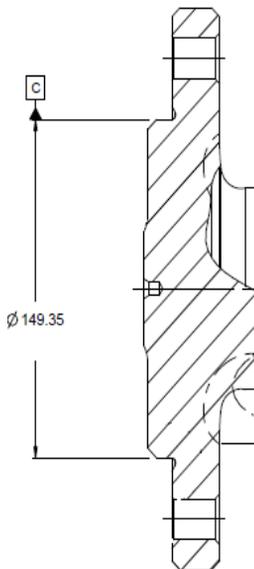
## Transmission

		<b>MF 6711R</b>	<b>MF 6712R</b>	<b>MF 6713R</b>
Type		Dyna-4 / GTA 2550		
Number of Ratios		16 Forward / 16 Reverse		
Number of Ranges		4		
Range Changes		Robotised Electro-hydraulic		
Number of Powershift Ratios		4		
Powershift Changes		Electro-hydraulic oil immersed clutches		
Shuttle Type		PowerShuttle with Power Control Lever		
Clutch Type		Oil Immersed multiple plate		
Clutch Operation		Electro-hydraulic		
Max Speed	kmh	40		
Supercreep Reduction Ratio		14 : 1		

# Specifications

## Rear Axle

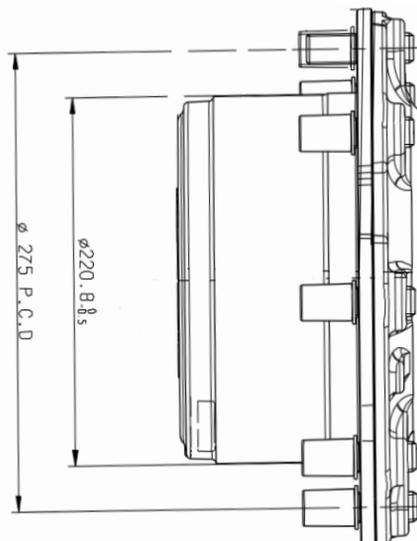
		<b>MF 6711R</b>	<b>MF 6712R</b>	<b>MF 6713R</b>
Type		GPA 54		
Description		Epicyclic		
Differential Lock		Mechanical Dog Clutch with Electro hydraulic actuation & Front Axle with Hydralock		
Brakes		Oil Immersed multiple plate with Electro-hydraulic Actuation & 4WD Engagement		
Additional Functionality		Brake to Neutral		
Towed Implement Brakes		Hydraulic (Option)		
Park Brake		Mechanical Actuation + 4WD Engagement		
Flange to Flange Distance	mm	1680		
Pilot Hole Diameter	mm	149,7		
Wheel Stud PCD	mm	203,2		
Wheel Stud Size		8 x M18 x 1.5		
Final Drive Reduction Ratio		5.36 : 1		
Bevel Gear Reduction ratio		4.7:1		
Total Rear axle Reduction ratio		25.192:1		



# Specifications

## Front Axle

		<b>MF 6711R</b>	<b>MF 6712R</b>	<b>MF 6713R</b>
Type		Dana 730		
Drive		Centre Drive Fixed		
Steering		Hydrostatic		
Steering Column		Telescopic and Tilt Adjustable		
Maximum Steering Angle	degrees	55		
Differential Lock		Hydralock with Electro-hydraulic Actuation in combination with Rear Axle		
Brakes		Automatic 4WD Engagement		
4WD Engagement		Spring On / Pressure Off with Electro-Hydraulic Actuation		
Flange to Flange Distance	mm	1640		
Pilot Hole Diameter	mm	221		
Wheel Stud PCD	mm	275		
Wheel Stud Size		8 x M18 x 1,5		
Bevel Gear Reduction Ratio		2.428:1		
Final Drive Reduction Ratio		6:1		
Total axle Reduction Ratio		14.57:1		
Inter-axle Ratio		1,3392:1		



# Specifications

## PTO

		<b>MF 6711R</b>	<b>MF 6712R</b>	<b>MF 6713R</b>
PTO Clutch Type		Oil Immersed Multiple plate with Electro-hydraulic Actuation		
PTO Speeds	revs/min	540/ 540E /1000		
PTO Speed Selection		Robotised Electro-hydraulic		
Engine Speed @ 540 / PTO	revs/min	1920		
Engine Speed @ 1000 PTO	revs/min	1964		
Engine Speed @ 540E PTO	revs/min	1560		
Output Shaft Type		6 Spline / 21 Spline (35mm Diameter) Bolt on flanged shaft		

## Hydraulic System

		<b>MF 6711R</b>	<b>MF 6712R</b>	<b>MF 6713R</b>
Type		Closed Centre Load Sensing (CCLS)		
Low Pressure Circuit Flow	ltr/min	32,7		
Low Pressure Circuit Pressure	bar	17		
High Pressure Circuit Maximum Flow	ltr/min	110		
High Pressure Circuit Maximum Pressure	bar	200		
Number of Auxiliary Valves		2 / 3		
Valve Configurations		Double Action / Float / Kick Out / Zero Leak / Flow Divider		
Operation		Mechanical		

# Specifications

## Rear Linkage

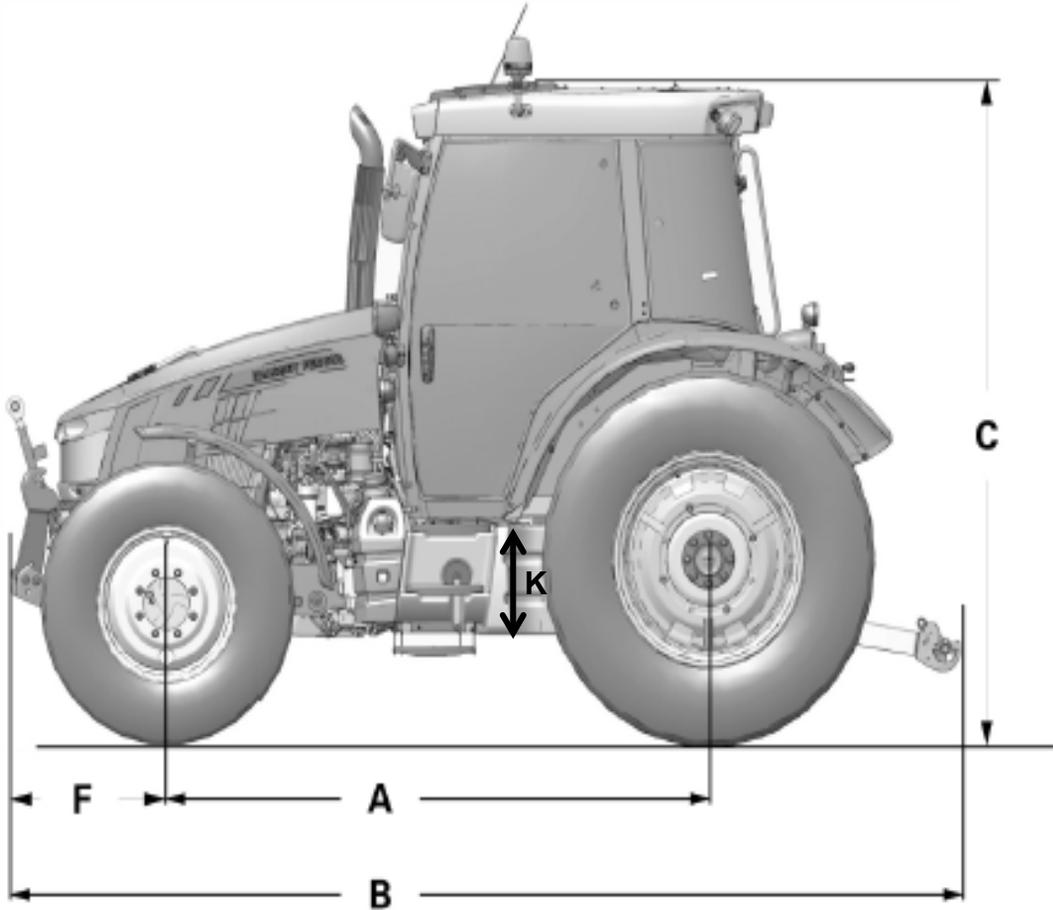
		<b>MF 6711R</b>	<b>MF 6712R</b>	<b>MF 6713R</b>
Lift Capacity	kg	5200		
Lift Cylinder Diameter	mm	85		
Linkage Category		III		
Lower Link Type		Cat III / II Fixed Ball Ends		
Top Link Type		Adjustable / Cat II Ball Ends		
Linkage Control		Electronic Linkage Control (ELC)		
Linkage Functions		Position-Draft-Intermix / Rate of Lowering / Maximum Lift Height / Active Transport Control		
Draft Sensing		Lower Link		
Lift Rods		Adjustable / Fixed / Float Position		
Stabilisers		Adjustable / Telescopic		

## Wheels & Tyres

		<b>MF 6711R</b>	<b>MF 6712R</b>	<b>MF 6713R</b>
Wheel Type	Front	Pressed Steel Adjustable		
Tyre Brand / Type	Front	Trelleborg TM600		
Tyre Size	Front	380/85R28		
Wheel Type	Rear	Pressed Steel Adjustable		
Tyre Brand / Type	Rear	Trelleborg TM600		
Tyre Size	Rear	460/85R38		

# Specifications

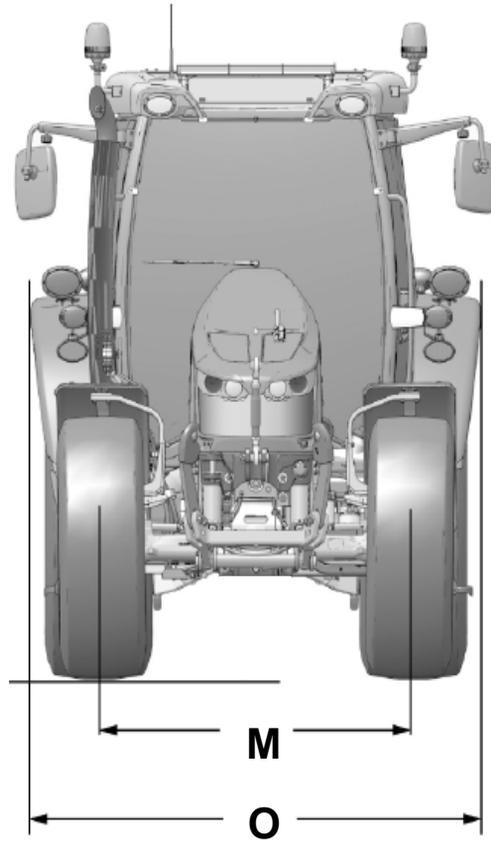
## Dimensions



A	Wheelbase	mm	2622	
B	Length without front weight up to the rear linkage	mm	4436	
B	Length with front weight up to the rear linkage	mm	4886	
B	Length with front weight + pin up to the rear linkage	mm	4956	
C	Maximum Height	mm	2885	
F	Front axle to the front	Without weight	mm	610
F		With weight	mm	1060
F		With weight + pin	mm	1130
K	Ground Clearance	mm	509	

# Specifications

## Dimensions



M	Flange to Flange – Rear axle	mm	1680
M	Flange to Flange – Front axle	mm	1640
O	Outer fender width	mm	2305

# Weight & Capacities

---

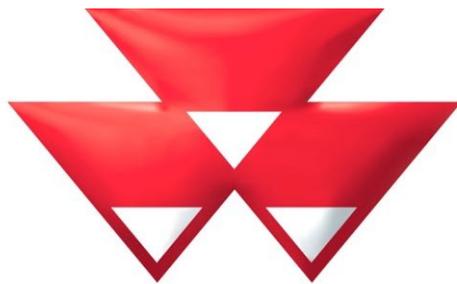
## Dimensions

<b>Weights</b>		
Weight – 4WD – Cab (No Ballast)	kg	5000
Weight – Gross Vehicle Weight *	kg	8500

<b>Capacities</b>		
Engine Oil	ltr	16
Engine Coolant	ltr	20
Fuel Tank	ltr	210
Transmission & Rear axle	ltr	Min 65, Max 75
Front Axle	ltr	5
Front axle final drives	ltr	0.8







**MASSEY FERGUSON**

**A world of experience. Working with you.**

Every effort has been made to ensure that the information contained in this publication is as accurate and current as possible.

However, inaccuracies, errors or omissions may occur and details of the specifications may be changed at any time without notice.

Therefore, all specifications should be confirmed with your Massey Ferguson Dealer or Distributor prior to any purchase.

AF/MB – 06/19

---

**FROM MASSEY FERGUSON**