



INFORMATION SHEET

PRODUCT: MANUTEC PRESS WHEEL PARTS

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PRESS WHEEL AND TYRE INFORMATION SHEET

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PRODUCT IDENTIFICATION

The majority of Manutec products will have the Manutec name painted or engraved on the part. Manutec identifies tyres and wheels by the following physical parameters.

Tyres: TD-PW-TW-SH-TM ie 15PW55WGSP

TD= Diameter of Tyre in inches (Normally 12/13/15/16/18)
PW=Press Wheel (Always PW)
TW= Tyre Width at Widest Point (Varies Between 55mm and 120mm)
SH= 2 letter shape designator (WG=Wedge, FL=Flat, RD=Round etc)
TM= Material (SD=Solid Rubber, SS=Semi-Solid Rubber, SP=Semi-Pneumatic Rubber)

Wheels: TD-PW-TW-SH- TM/B-CT-AX ie 15PW55WGSP/AIRD

TD= Diameter of Tyre as fitted to rim in inches (Normally 12/13/15/16/18)
PW=Press Wheel (Always PW)
WW= Tyre Width at Widest Point (Varies Between 55mm and 120mm)
SH= 2 letter shape designator (WG=Wedge, FL=Flat, RD=Round etc)
MA= Material (SD=Solid Rubber, SS=Semi-Solid Rubber, SP=Semi-Pneumatic Rubber)
B=Centre Material (A=Alloy, G=Galvanised Steel)
CT=Centre Type (I=Integral, HT=Holden Hub, SB=Sealed Bearing, NB=Nylon Bush)
AX=Axle Shape (RD=Round, SQ=Square)

Bearings and Seals

Integral (I) and **Holden Hub (HT)** are fitted with LM Taper Bearings.
SB are fitted with either 16mm or 25mm Sealed Bearings.
SBLC are fitted with 25mm Sealed Bearings and Locking Collars
NB are fitted with either 25mm (1") or 32mm (1 1/4") Nylon Bush



Press wheels

Introduction

This document has been prepared by Manutec for use by farmers to assist them in selecting the best press wheels for their circumstances. The information in this document is a combination of practical experience and scientific research. Scientific basis comes from a variety of research documents produced by the government agricultural research agencies of SA, WA, VIC, NSW and QLD and the practical from over 20 years of manufacturing and developing press wheels.

The use of press wheels is an important step in increasing efficiency and durability of seed emergence. Used correctly they can typically increase emergence by 10% to 25% as well as improving seedling durability. Tyre pressure over the seed trench gives better seed soil contact, reduces the speed of soil drying, maximises moisture availability and helps to optimise use of existing sub soil moisture.

Advantages of press wheels are:

- Increased seed soil contact.
- Moisture maximisation.
- Increased local soil compaction, which restricts insect movement and consequent damage to seed and seedling.
- Reduced emergence depth by decreasing the distance between the seed and seedbed surface.
- Allows a range of point/boot/wheel combinations
- More uniform soil coverage across the width of a planting machine is ensured.
- The seed furrow is closed to prevent surface light penetration, particularly on heavier soils. This can cause premature sub surface leaf emergence.
- Smaller falls of rain are concentrated into the seed furrow, thereby promoting faster secondary root development.

Many of Manutec's customer also report a wider range of local advantages that they have found when using press wheels.

It is also important to state the counter argument and that is that some farmers have had bad experiences with press wheels and believe that there is no real benefit to them in using press wheels. Manutec's opinion is that in these cases one of two possibilities has occurred, either poor tyre selection or poor assembly selection. This is based on our anecdotal experiences with those customers that have not had the expected results with one set or one tyre but have achieved good results after making a change. Unfortunately many manufacturers have moved into press wheels without understanding that needs vary significantly from one region to the next, one season to the next and one crop to another. Most of these manufacturers are now well gone but the legacy of failure remains. Be wary of the manufacturer that claims they have an all in solution that will work everywhere.

In a no-till/direct drill planting situation press wheels are essential in most soil types, however the behaviour of the press wheel will vary considerably. The decisions and



thought process involved in choosing and setting up press wheels is very important. The wrong decision can prove to be costly both in terms of equipment cost but also in terms of benefits in increased yield. When buying equipment fitted with press wheels, do not leave this decision up to the dealer or manufacturer unless they have considerable experience with what works in the area concerned. When buying second hand equipment from another area, do not expect that the tyres on the press wheels are going to give you the best result as they may not.

Before choosing the press wheel, it is important to consider the following list of factors, each of these factors will have a range of implications and by going through each factor, different wheels can be ruled in or out.

- Soil Type
 - Sand, loam, self wetting, self mulching, clay (red, grey, black)
 - Prevalence of Rock
 - Abrasiveness to rubber
 - Amount of top soil
 - Tendency to Clod
 - Worked or unworked
- Typical Rainfall during germination/establishment period
- Existing soil moisture and depth of sub soil moisture
- Type and width of point
- Seeding Method
 - Single row, split row, spread row
 - Row Spacing
 - Speed
 - Dry sew, wet sew or both
 - Tramline (up and back), round and round or both
- Crop Type
 - Small, medium or large seed
 - Pressure sensitive
 - Depth Sensitive
- Next year crop/stock rotation
 - Fallow
 - Sheep
 - Cattle
 - Same/different crop



- Trash Levels
- Machine Type
 - Hydraulic Lift
 - Weight Sensitivity
 - Inframe and Under Frame Clearances
 - Breakout type and pressure
 - Tyne Layout
 - Obstructions (wheels, cross members, hydraulics)
 - Air Cart/Seed Box position (Front/Top/Behind)

Tyre Shape/Profile

The shape of the press wheel tyre will depend on a number of the above factors, the most common shapes and the characteristics of each are below. Note that it is important that the decision process regarding the points to be used is also done in conjunction with the press wheel selection process.

Broad Wedge (3" overall width, 1" flat tip)



- Used extensively in southern states
- Good moisture seeking and moisture harvesting properties
- Good depth control in medium to light soil structures
- Good all purpose profile gives a good balance between seed soil contact and moisture harvest
- Ideal for single narrow row seeding
- Good tracking characteristics
- Above average wear and durability
- Average to good mud shedding capability
- High pressure tyre
- Tendency to leave paddocks rough
- Works well in light to medium soils, may shoulder out in heavy soils behind narrow points

Flat (sometimes referred to as square) (4" overall width)



- More common in areas of above average rainfall
- Very good seed soil contact
- Good depth control in medium to light and sandy soil structures
- Good scattering of loose soil above pressed seed.
- Ideal for spread row or split seeding
- Good mud shedding capability
- Average wear and durability
- Low pressure tyre
- Does not handle "cloddy" soil well
- Sometimes used in combination with a wedge, but across the back of the machine to help bring soil in across the top of the seed.

Rounded (3" overall width)



- Used as a trade off (half way) between wedge and flat profiles
- Properties similar but not as pronounced as compared to the wedge and flat
- Medium Pressure Tyre
- Preferred if field "roughness" is an important consideration

Wide Wedge (4" overall width, 1.5" flat tip)



- Above average moisture harvesting properties
- Good depth control in light and sandy soil structures
- Good all purpose profile gives a good balance between seed soil contact and moisture harvest
- Good for spread and split row seeding where some moisture harvesting is required
- Good tracking characteristics
- Above Average wear and durability
- Low pressure tyre
- Average to good mud shedding capability
- Does not handle "cloddy" soil well

- Will not leave paddocks as rough as the 3" wedge
- May require ticklers/snake chain to give some soil scatter over pressed seed

Narrow Wedge (2" overall width, 3/4" flat tip)



- Used extensively in NSW and QLD
- Very Good moisture seeking and moisture harvesting properties
- Good depth control in heavy soil structures
- Poor depth control in light soil structures
- Good seed soil contact when drilling deep with narrow tyre
- Ideal for single narrow row seeding
- Good tracking characteristics
- Average wear and durability
- Good mud shedding capability
- High pressure tyre
- Tendency to leave paddocks rough

Other Tyre Profiles

- Narrow Dome/vee (2") 
- Ribbed (3")  
- Broad Dome/Vee (3")  
- Narrow Flat/Square (2")  
- Round (3.5") 
- Extra Wide Flat (5") 

Tyre Diameter

The tyre diameter used can be an important factor in areas where tyre performance is marginal. A larger diameter tyre may give better cleaning as the rubber will flex more. Some customers also like the larger rolling diameter as it may increase the mean time between failures of components such as bearings and tyres. In situations where a higher than normal pressure is required the larger diameter may help due mainly to its increased weight and in high trash environments the larger diameter may improve trash flow, by increasing the ground clearance of trash collecting parts such as frames and axles. All of these gains in the majority of cases may not be sufficient to warrant the additional cost and weight. Unlike profile and material size is not normally a critical factor.

Manutec does a range of tyre diameters, these are broken down in three nominal sizes, 15", 16" and 18". The 15" and 16" tyres both fit onto the standard 15" rim, ie they are interchangeable with each other. The 16" tyres have an additional half inch



of rubber all way round, which may improve cleanability (semi-pneumatic variants) and wearability (solid variants). The 18" is a different rim size.

Tyre Material and Composition

The tyre material and composition chosen will depend on three main factors;

- Soil Stickiness
- Durability
- Soil/Rubber abrasion

The most common material is a softer more flexible compound in a semi-pneumatic tyre that gives the tyre a good self cleaning capability and reduces the need considerably to use scrapers. This material is however not as durable and will not handle stone, wire, wood as well as harder compounds, this material will also wear out at a faster rate. The final decision is almost always a trade off as most farms have a wide cross section of soils, rock, clay that needs to be dealt with. Generally the trend is toward the softer tyre as the mud and clay is often considered the factor that dominates choice. Expect an average of 10% tyre wear/replacement per year if using semi-pneumatic tyres. This will vary depending on acreage and soil abrasiveness.

Traditionally the harder material in a solid tyre was favoured, however in recent years this has changed considerably with many farmers changing from hard solid tyres to the soft semi-pneumatic ones. If however durability is the predominant factor then hard tyres should be used. Scrapers will most likely be required.

The recent trend for 50% or more of the crop to be dry sewn and the remainder wet sewn creates a further dilemma as ideally a hard tyre should be used for the dry sew and a soft semi-pneumatic tyre for the wet sew. This is because dry sewing is much harder overall on all machine components including the press wheel tyres and soil build up should not be a problem. This gives four possible options for the farmer.

- Hard Tyre (Scrapers in heavy wet conditions)
- Soft Tyre (Wear tyres out quickly due to dry sewing)
- Two sets of tyres – hard and soft (Ideal Scenario)
- Semi-Solid Tyre

The Semi-Solid tyre is a trade off where the softer material is used and the wall thickness more than doubled. This is used extensively behind disc machines where the tyre is used more for closing than pressing and in areas of high rubber abrasion (Grey clay). It is not normally recommended as it is an in between material that will not produce the best result in either hard or soft conditions. The farmer should also consider carefully in what order paddocks are sewn, taking into account varying soil structures and moisture levels.

Many farmers do not like the idea of two sets of tyres because of cost and time. For a 50 tyne machine the average cost of a second set of tyres is around \$2000 and the time taken to replace the tyres on the whole machine (if on Manutec rims) and using a pneumatic gun is 2 to 3 hours (ie 2 to 3 minutes per tyre). If a full set of soft tyres is worn out because of hard sewing this money and time investment is inevitably going to have to be made anyway.



Tyre Pressure

There are many variables to consider when setting pressure and while several rule of thumb are available, setting for your own conditions at the time of planting is the most reliable. Recommended pressure should be between 2 and 4 kg per cm of tyre face, use the notes below to help determine optimum.

Optimum press wheel pressure depends on soil type, soil moisture level at planting, crop type and time of planting. Generally lower pressures are used in wet soils and pressure increased for drier planting. Lower pressures are required in lighter sandier soils than heavier clays. As a result it may be a requirement to vary pressures for different areas on the same property, particularly if heavy clays and sandy soil are both present.

Most importantly the press wheel must close the planting slot. If you inspect the job and can see seed in the bottom of the trench then the press wheel is not doing its job. This scenario can occur in very puggy wet clay soil types. You either have to increase press wheel pressure or change to a more aggressive tyne point or a combination of both. After that criterion is satisfied (trench closed) then the next test is the seed has to finish up into firmed moist soil and for most seeds about 20-25 mm below the press wheel mark. A layer of loose soil on top of the press wheel track will assist in preserving moisture and preventing the tyre track from setting hard. Some soils will flow naturally or be assisted by following with ticklers or lengths of chain (snake chain).

Always check your calculated weight with the press wheels in the paddock at the intended working depth, this can be done with a spring scale or a set of bathroom scales. If the trench is properly closed then ease the pressure off, particularly for sensitive seeds. This will reduce the load on tyres, bearings and other components.

Pressures at the higher end of the recommended ranges should be used when:

- Zero till planting into sticky clay soils.
- Soil moisture is marginal and planting depth must be increased.
- High soil insect population exists.

Pressure at the lower end of the recommended ranges should be used on poorly structured soils with hard setting characteristics. Too much consolidation of soil over the row may impede the emergence of the young shoot as well as causing surface crusting.

Hub Type

There are four main types of press wheel hub.

- Integral – One piece cast alloy unit with tapered roller bearings (HT) to suit a 40mm round or square stub axle, marine grade seal and inbuilt dust cap protection. Narrow hub profile. The integrals have recessed seals and retained dustcaps for extra protection. The bearings are standard automotive available at most garages, auto shops and bearing suppliers.
- HT – Separate cast steel hub, same bearings and seals as Integral, 40mm round or square stub axle, separate dust cap protector. Wide and Narrow Hub profiles available (Narrow profile uses Integral stub axle). The bearings are standard automotive available at most garages, auto shops and bearing suppliers.



- Sealed Bearing – two sealed roller bearings either with or without locking collars. Bearings available to suit a range of shaft sizes. Normally used with A-Frame design shaft.
- Nylon Bush – Hard Nylon Bush centre to suit either 25mm or 32mm shaft size. Normally used in conjunction with straight through gang shafts running on separate pillow block bearings.

For advice on the most appropriate system to use contact Manutec, 08 8260 2277.

Assembly Type

There are four main types of press wheel assembly.

- Trailing Swivel/Fixed, individual assemblies.
- Trailing Swivel/Fixed, twin assemblies.
- Inframe Swivel/Fixed, individual assemblies.
- Gang Assemblies.
- Fixed, Adjustable and Semi Adjustable Tyne Mounted Assemblies.

For advice on the most appropriate system contact Manutec, 08 8260 2277.

Disclaimer

The nature of press wheels is that they will give very different results across a range of farming techniques, machinery combinations, environmental conditions and soil types. The advice in this document is general in nature and is not to be used as the sole source of information when choosing press wheels. It is strongly advised that this is used in conjunction with either specialist local or practical knowledge to determine the best configuration for individual circumstances. If this is not available then a series of short trials is recommended to give actual performance characteristics in individual conditions.

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