

SAP-METAL FACE SEALS

For Tractor Axles



Reliable Sealing Solutions
For Agriculture Tractor Applications

Farming... Made Easy

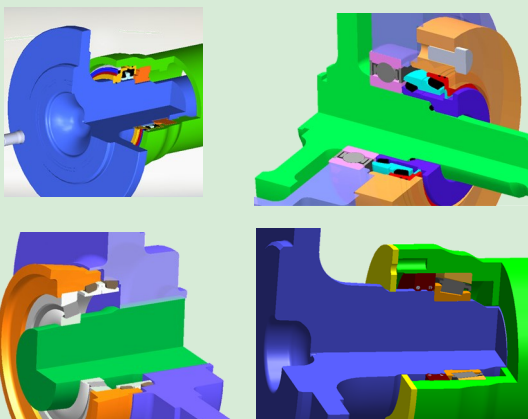


"Agriculture Tractors employed at the farms fields are put to one of the most hostile working environments and protection of the Axles, PTO, transmission as well as the bearing systems associated from the mud and dust, is a challenging task. Only the reliable sealing solution can warrant the best performance of the equipment."

SAP—Innovative Metal Face Seals for Tractor Application

SAP MFS Design Solutions

- Unitized MFS for PTO Shaft
- MFS for Rear Axles
- MFS for Front Axles — Wheel Hub Sealing
- MFS for Front Axles — Swivel End Sealing
- MFS for Tail Pinion



Technology at work for you

INTRODUCING—INNOVATIVE SOLUTIONS FOR SEALING CHALLENGES

Tractor Axles, PTO Shafts and associated systems are highly prone to failure while in run at the field, owing to the limitations of the conventional sealing designs employed in these system. Only elastomeric arrangement of multiple layers or cassette sealing arrangement can not offer reliable leakage free sealing of the axles. The most common challenges in the tractor transmission sealing i.e. Premature failure of oil seal, consequential failure of bearings, gears, shaft and overall low Life expectancy of oil seals, remain unanswered with any conventional seal design. SAP Metal Face Sealing is a unique engineered solution working on the principle of mechanical sealing, which can be employed at various locations in the tractor that offers the phenomenal service performance, and much higher service life against the conventional seals and can be customized to the application requirements.

Competitive advantage of SAP Parts

TECHNOLOGY & ENGINEERING, THAT PROVIDES A TOTAL END TO END SOLUTION.

SAP Parts Metal Face Seals are designed to offer the highest dependable leakage free Sealing performance in the tough farming environments, for the Axle & the transmission system of agriculture tractors and implements, comes with the engineered and proprietary processes, materials & elastomers.

● Metal Face Seal - Materials

SAP MFS ensure an adequate resistance to the metal seal abrasion, corrosion during the work and offers the highest heat dissipation ability which is achieved by unique metallurgical understanding and patented processes that transforms precipitation of the graphite in the secondary matrix of carbides in the microstructure of Ni-Hard alloy rings using Centrifugal Casting process. The elastomers as well, are specially developed to suit the specific working environments, especially compatible to different lubrication fluids available in the wet brake system and to offer the adequate resistance to a wide range of temperature range and harsh external contaminants.

● Design

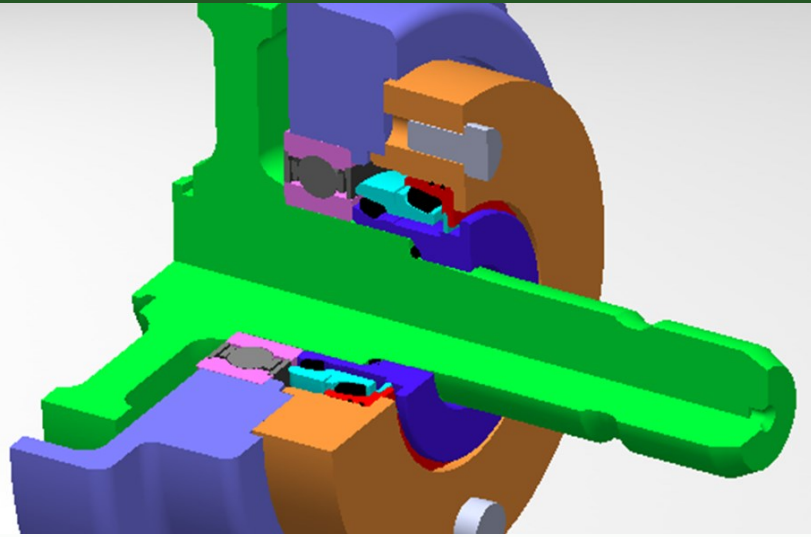
SAP MFS are truly engineered solutions and offers the design choice based on the extensive study of running conditions of tractors with regards to higher speed, higher torque, internal pressure built inside the system, external mud environment, seal housing specifications and various load profiles to which the system is put for, as to warrant the most effective sealing over a time. Customized designs are categorically offered to suit the specific application conditions.

1. Unitized MFS for PTO Output Shaft

The growing demand for advanced and reliable sealing solutions on even the heaviest slurry applications and higher surface speed applications has resulted in the development of a new and improved design of single Unitized Mechanical seals – for PTO Shaft application for Tractors, while the various customized and unique design solutions offered by SAP Parts have already provided excellent results in all light to medium mud slurry applications. The new design PTO seals are of complete “ready to fit” cartridge type and can replace the standard shaft sealing arrangement. The Unitized seal is a pre-adjusted “slide on unit” and require no further settings.

Competitive Advantage of - Unitized Mechanical Face Seal

SAP Parts Unitized Seal design offers competitive advantage over the functional limitations of conventional sealing system in PTO applications, in terms of reduced service life, higher sealing performance, life time arrangement, easy installations without changes in housing of Tractor Transmission system, no re-lubrication as well as overall cost reliability.



DESIGN FEATURES

The unitized mechanical seal design makes the seal ideal for the toughest mud & slurry applications. The basic principle of this mechanical seal is that lubricating Oil inside the seal is provided. This oil lubricates and cools the seal faces. The lubricating function becomes more efficient when the sealing liquid is kept at a higher pressure than the mud slurry entering in the housing chamber.

APPLICATION MANAGEMENT

In the un-mounted condition of the Unitized metal face Seal assembly, there exists an axial clearance between the sleeve and adapter housing faces. While assembling, an appropriate tool and correct installation method be followed. The assembly is press fitted on the shaft and as the sleeve progress till bearing Inner race face the gap between adapter housing and sleeve face reduces to zero. This is the condition when seal assembly perfectly fits on the shaft. As this seal is designed for high RPM, the cover is to be fitted firmly. Since the assembly is unitized and a special grease is filled in for life time, it do not require frequent lubrication.

TECHNICAL SPECIFICATIONS

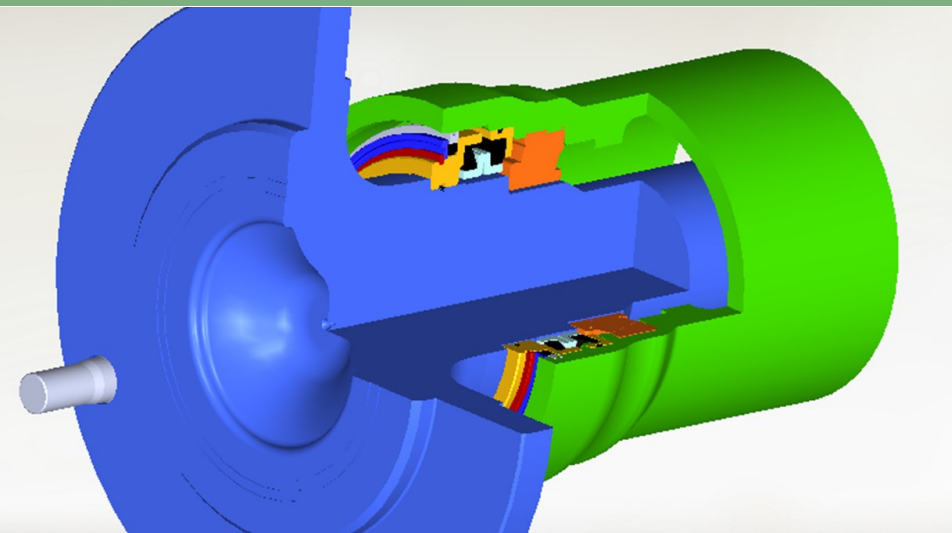
	SAP Parts Sealing Solutions	Unitized MFS for PTO Output Shaft
Application Details	Service Environment	Deep Puddling, Dust, Clay, Fully Submerged, Weeds, Straws, Abrasives, Fertilizers, Tar, Saline Water, Brick Kiln mud, etc.
	Surface Speed (Max)	5 m/s
	Type of Lubrication	OIL
	Max Temp.	120°C
Assembly Constraints	Dynamic Radial Float (mm)	1
	Dynamic Axial Float (mm)	0.5
	Radial Misalignment (mm)	0.5
Competitive Advantage (Value Engineering)	Mating Part Modifications (Required/Not)	Little Modification Required
	Eliminating Existing Child Parts	YES
	Fitment Criticality (Easy/Moderate/Critical)	Easy
	Special Installation Tools if required	Not Required
	Design USP	Unique Sacrificial Seal Added
Service Life Expectancy	Conventional Seal	400-600 Hrs.
	SAP Parts Seal	1200 Hrs.*

2. Unitized MFS for Rear Axle

Conventionally a Multi Lip Seal is employed in the Rear Axle of tractor to protect the mud entry in the transmission, however this sealing systems does not fully satisfy the intended purpose due to its limitations in handling extreme working conditions. These seals have sensitivity to radial shaft motion and shaft-to-housing eccentricity. These seals hence cannot be ideally used in highly abrasive applications and do not work well with light hydrocarbons, fertilizers, organic residues in in the paddy mud environment. On account of extreme application conditions, in rear axle conventional sealing arrangements observed to be failing with higher frequency and increased service demands.

Competitive Advantage of - Unitized Mechanical Face Seal

SAP Parts Unitized Seal design offers competitive advantage over the functional limitations of conventional sealing system in Tractor Rear Axle applications, in terms of reduced service life, higher sealing performance, life time arrangement, easy installations without changes in housing of Tractor Transmission system, no re-lubrication as well as overall cost reliability.



DESIGN FEATURES

A Special—unitized - mechanical face seal for Tractor Rear Axle application is a higher version of simple mechanical face seal. This Face Seal Assembly consist of HDDF Type seal fitted in specially developed adapter housing and counter sleeve. This seal also have sacrificial sealing arrangement to protect the dust entry.

APPLICATION MANAGEMENT

Mechanical Face Seal Assembly consist of two metallic seal rings mounted in separate housing face to face. The elastomeric elements center the seal in the housing. The adaptor housing which holds one of the metal face seals (stationary seal) by an elastomeric T-ring compressed inside. The specially designed counter sleeve holds another metallic seal ring opposite to it acts as another metal face seal (rotary seal). The interface between the two precision lapped mating surfaces rotating against the other at right angles to the shaft. They form a leak-proofed seal. Secondary O-rings are located in between shaft - counter sleeve as well as in between Adapter housing -trumpet as to make possibly a firm and leak proof contact .The counter sleeve have sacrificial sealing arrangement. It consist of calculated O ring groove which hold the

TECHNICAL SPECIFICATIONS

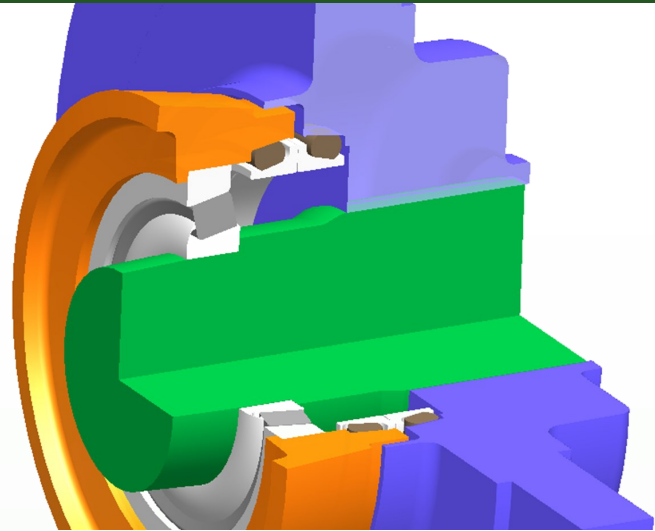
	SAP Parts Sealing Solutions	MFS for Rear Axles
Application Details	Service Environment	Deep Puddling, Dust, Clay, Fully Submerged, Weeds, Straws, Abrasives, Fertilizers, Tar, Saline Water, Brick Kiln mud, etc.
	Surface Speed (Max)	3 m/s
	Type of Lubrication	OIL
	Max Temp.	120°C
Assembly Constraints	Dynamic Radial Float (mm)	1
	Dynamic Axial Float (mm)	0.5
	Radial Misalignment (mm)	0.5
Competitive Advantage (Value Engineering)	Mating Part Modifications (Required/Not)	Little Modification
	Eliminating Existing Child Parts	YES
	Fitment Criticality (Easy/Moderate /Critical)	Easy
	Special Installation Tools if required	Required
	Design USP	Sacrificial Seal Added
Service Life Expectancy	Conventional Seal	500-650 Hrs.
	SAP Parts Seal	2000 Hrs.*

3. MFS for Front Axles — Wheel Hub Sealing

The wheel hubs assemblies of tractor are essentially associated with a lubrication system for bearings witness the heavy leakage in a short service span, owing to the premature failure of the sealing systems. Conventionally the multi lip oil seals are used for this function. These seals have sensitivity to axial shaft motion caused by the endplay in the hub bearing system, and the intended sealing performance can not be achieved if leakage of lubrication oil remains persistent. These seals hence cannot be ideally used in highly abrasive applications and do not work well with light hydrocarbons, fertilizers, organic residues in the paddy mud environment. On account of extreme application conditions, hub sealing arrangements observed to be failing with higher frequency and increased service demands.

Competitive Advantage of - SAP Metal Face Seal

For the wheel Hub application, which is exposed to mud, slurry and extremely harsh environmental conditions, and working relatively at higher surface speeds, SAP metal face seals are a boon over the conventional lip seals, as it bears the high abrasion resistance capability achieved by the proprietary cast alloys and the combination of specialty elastomers made to be compatible with the lubrication, with a service performance up to 2000 Hrs.



DESIGN FEATURES

Mechanical Face Seal consist of two metallic seal rings. They are mounted in separate housing face to face. The elastomeric elements (Rubber O ring) center the seal in the housing. At installation, the O-rings are compressed between the tapered contact surfaces of the seal ring and housing. The O-rings undergo a calculated compression which is critical for proper operation of the sealing system.

APPLICATION MANAGEMENT

The Metal rings are designed in such a way that they open out from the seal faces towards the center axis, forming a cone-shaped gap which has the benefits like the lubricant is readily admitted to the seal faces by capillary action and centrifugal force, the adequate lubrication and cooling are assured and potential cold welding of the seal faces is avoided, as the wear increases, the sealing face continuously shifts towards the center axis. Therefore, the seal has considerable wear reserves which virtually only end when the inside diameter is reached and as a result of this system a slight oil film can appear on the outer sealing surface.

TECHNICAL SPECIFICATIONS

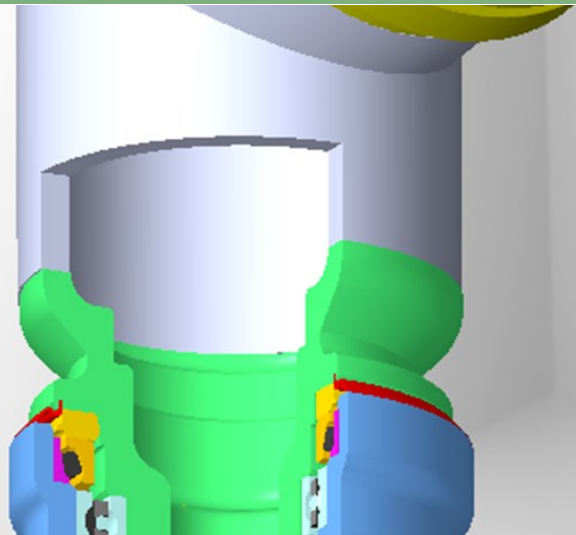
	SAP Parts Sealing Solutions	MFS for Front Axle Wheel Hub Sealing
Application Details	Service Environment	Deep Puddling, Dust, Clay, Fully Submerged, Weeds, Straws, Abrasives, Fertilizers, Tar, Saline Water, Brick Kiln mud, etc.
	Surface Speed (Max)	3 m/s
	Type of Lubrication	OIL
	Max Temp.	100°C
Assembly Constraints	Dynamic Radial Float (mm)	1
	Dynamic Axial Float (mm)	0.5
	Radial Misalignment (mm)	0.5
Competitive Advantage (Value Engineering)	Mating Part Modifications (Required/Not)	Little Modifications Required
	Eliminating Existing Child Parts	YES
	Fitment Criticality (Easy/Moderate/Critical)	Easy
	Special Installation Tools if required	Required
	Design USP	-
Service Life Expectancy	Conventional Seal	300-500 Hrs.
	SAP Parts Seal	2000 Hrs.*

4. MFS for Front Axles — Swivel End Sealing

Swivel end of the tractor axle are one of the critical power transmission systems, are essentially consisting a drive shaft with swivel motion contributing to movement of front wheels. The system employed with the thrust bearings witness a premature oil leakage with conventional rubber oil seals . Due to the design & vertically inclined position of swivel system, the mud water from the down side enters in the hubs and remains accumulated causing its entry in transmission system from a partially worn out seal circumference due to angular friction, and thus leakage and contamination both are persistent in a short service life SAP Metal face seals unique inverted designs helps to overcome this challenge with a greater application performance.

Competitive Advantage of - SAP Swivel End Sealing

While the surface speed associated with swivel end is comparatively lower than that of other systems, the wear of metal parts on account of accumulated contaminants is very high. SAP Seals provide high corrosion and abrasion resistance achieved by its proprietary cast alloys, offers phenomenal protection to oil leakage and consequent failures.



DESIGN FEATURES

This mechanical face seal assembly is higher version of simple mechanical face seal. This development relates to seals, and more specifically to metal face seals for Swivel joint of tractors. This seal has unique sacrificial sealing arrangement to protect the entry of dirt, dust, fine clay ,paddy straw etc. One end of Rubber seal is bonded on Counter ring and another is rested on housing with positive compression load. This compression load help to make secondary leak proof contact.

APPLICATION MANAGEMENT

The face seal consists of an adaptor housing which holds one of the metal face seals (rotary seal) by an elastomeric O-ring compressed inside the housing. A secondary O -ring is located in between knuckle and adapter housing, as to make possibly a firm and leak proof contact. The specially designed counter ring face opposite to it acts as another metal face seal (rotary seal) which is press fitted on shaft. This seal has unique sacrificial sealing arrangement to protect the entry of dirt, dust, fine clay ,paddy straw etc.

TECHNICAL SPECIFICATIONS

	SAP Parts Sealing Solutions	MFS for Front Axles — Swivel End Sealing
Application Details	Service Environment	Deep Puddling, Dust, Clay, Fully Submerged, Weeds, Straws, Abrasives, Fertilizers, Tar, Saline Water, Brick Kiln mud, etc.
	Surface Speed (Max)	2 m/s
	Type of Lubrication	Oil/Grease
	Max Temp.	100°C
Assembly Constraints	Dynamic Radial Float (mm)	1
	Dynamic Axial Float (mm)	0.5
	Radial Misalignment (mm)	0.5
Competitive Advantage (Value Engineering)	Mating Part Modifications (Required/Not)	Required
	Eliminating Existing Child Parts	YES
	Fitment Criticality (Easy/Moderate /Critical)	Moderate
	Special Installation Tools if required	Required
	Design USP	Rubber Seal (Secondary sealing)
Service Life Expectancy	Conventional Seal	600 Hrs.
	SAP Parts Seal	2000 Hrs.*

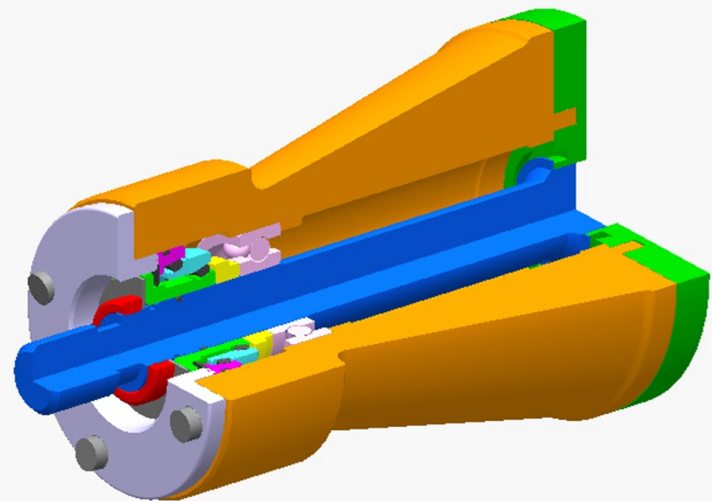
5. MFS for Tail Pinion Sealing

Tail pinion assemblies in the transmission system are subject to a higher RPM especially in 4 WD tractors experience oil leakage on account of rubber lip seals getting hardened due to frictional & thermal activity at the contacts of shaft. The leakage hence degrade the system performance by starvation of oil lubrication to bearings and splines associated. SAP metal face sealing is conceptualized to offer an integrated solution, as like in its PTO shaft seals that is meant for the life long performance without frequent failures.



Competitive Advantage of - SAP Tail Pinion Sealing

SAP Parts Unitized Seal design offers competitive advantage over the functional limitations of conventional sealing system in PTO applications, particularly in 4 WD tractors, in terms of reduced service life, higher sealing performance, life time arrangement, easy installations without changes in housing of Tractor Transmission system, no re-lubrication as well as overall cost reliability.



DESIGN FEATURES

This is a unitized seal development relates to seals, and more specifically to metal face seals for the 4WD Pinion shaft of tractors. The seals are of complete “ready to fit” cartridge type and can replace the standard shaft sealing arrangement. The unitized seal is a pre-adjusted “slide on unit” and require no further settings.

APPLICATION MANAGEMENT

The unitized metal face seal consists of an adaptor housing which holds one of the metal face seals (stationary seal) by an elastomeric O-ring compressed inside the housing. The specially designed counter ring face opposite to it acts as another metal face seal (rotary seal). This center ring fitted on the sleeve with help of special elastomeric o ring. A secondary O-ring is located in between shaft and seal, as to make possibly a firm and leak proof contact between the main pinion shaft and the seal assembly. The Possible mud entry from the outside of system is prevented by the sealing arrangement governed by O-Ring adaptor Housing , Rubber seal (Sacrificial seal) and the Sleeve.

TECHNICAL SPECIFICATIONS

	SAP Parts Sealing Solutions	MFS for Tail Pinion
Application Details	Service Environment	Deep Puddling, Dust, Clay, Fully Submerged, Weeds, Straws, Abrasives, Fertilizers, Tar, Saline Water, Brick Kiln mud, etc.
	Surface Speed (Max)	5 m/s
	Type of Lubrication	OIL
	Max Temp.	100°C
Assembly Constraints	Dynamic Radial Float (mm)	1
	Dynamic Axial Float (mm)	0.5
	Radial Misalignment (mm)	0.5
Competitive Advantage (Value Engineering)	Mating Part Modifications (Required/Not)	Required
	Eliminating Existing Child Parts	YES
	Fitment Criticality (Easy/Moderate/Critical)	Moderate
	Special Installation Tools if required	Required
	Design USP	Sacrificial Seal Added
Service Life Expectancy	Conventional Seal	700-850 Hrs.
	SAP Parts Seal	2000 Hrs.*

CONTACT & SUPPORT

About SAP Parts Company

Established in the year 2009, SAP Parts has steadily emerged to be a leader in manufacturing floating seals. Over the years, the company has progressed to accomplish the ISO:9001-20015 accreditation, it ventured into the competitive and demanding European Market, launched a Seal Technology Centre at the city of Pune in INDIA, established its presence in Germany, and a joint venture in Canada. Moreover, it reached successfully to all the customers and been acclaimed for the persistent performance. SAP Parts also remarkably provide the technology sealing solutions to Defense Industry across the world.

Why Choose SAP Parts for Mechanical Face Seals?

Besides being an organized and credible manufacturer in the industry, there are several other reasons why you must choose Sap Parts over other duo cone brands in the market. SAP Parts employs a team of highly qualified & dedicated professionals who know very well about what they are doing, SAP Parts offers the competitive pricing policy, provides quick and customer-friendly after-sales service, has the transparent business practices, and above all the guaranteed customer satisfaction at all times for every project. Over the years, with its excellent products and assured customer satisfaction, SAP Parts has built a strong client credentials, and professionally serves several organizations within the mining, agriculture, industrial, and construction industry.



Farming... Made Easy



SAP Parts Pvt. Ltd.

1087/04, Pune-Nagar-Pimple Jagatap Road,
Sanaswadi, Dist. PUNE—412208
Maharashtra State, INDIA

Ph: + 91-2137619269/71

Www.sapparts.com

Email: sales@sapparts.com