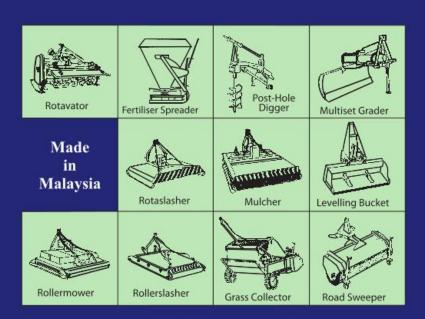




Owner's Manual & Parts List for HOWARD



2, Jalan Perusahaan Tiga, Batu 20, 48000 Rawang, Selangor Darul Ehsan, Malaysia.
Tel: 603 - 6093 1010 Fax: 603 - 6092 1010
e-mail: howardmy@tm.net.my www.howardmy.com

SAFETY

In the Owner's Manual accompanying each machine manufactured by HOWARD Alatpertanian Sdn. Bhd., Malaysia, (HOWARD), Safety features and precautions to be taken when operating the various implements are duty described.

Some or all of the following informtion or warning labels are affixed to the machines.

Machine model	Label	Warning / Information
All	Model	Followed by model number embossed on the machine frame
All	Serial No.	Followed by year of manufacture (alphabet code), and production serial number embossed on the machine frame.
		General warning that:
All	\triangle	a) the machine may pose danger to operator and/or surroundings.
All		b) such dangers are described with precautions to be taken in the accompanying Owner's Manual.
All	(€	c) HOWARD has sought to minimise such dangers in compliance with appropriate safety directives, and maintains technical records accordingly.
All		Name and address of manufacturer (HOWARD) and year of manufacture.
All	X	Beware of flying objects and stay clear of operating machine.
HR/HS/HFS/PHD/ HM/HRM/HSW/	. *	Affixed to rotating universal drive shaft (U/J) linking tractor with implement. Refer also to the safety and maintenance guidelines as
HSC/HA/HMC/HTS		described by the OEM U/J manufacturer supplied with each universal drive shaft.
HR/HS/PHD/	Hot oil	Gearbox oil may become hot after continuous operation.
HM/HRM/HSC/		,
HA/HMC		
Various	Others	General informative or safety stickers as oppropriate.

DECLARATION OF CONFORMITY

We declare that HOWAD implements/machines have been manufactured in conformity with EU Council Directive 2006/42/EC -L 157.

Kuala Lumpur, Malaysia - 12th January 2010.

Mohd Rafi bin Jamlus

(Production Manager)

Balasubramaniam Vailu (QA - Inspection)

Diana Bartolome (ISO MR)

HEALTH

The safety and health of operators and fitters is generally the responsibility of the owner of the machine. However, HOWARD has strived to design its implements so as to minimise risks.

Likewise, in the manufacturing process, emloyee safety and health is monitored in accordance with Malaysian law and HOWARD's internal production management systems.

ENVIRONMENT

Environmental assessment is carried out on HOWARD's products and manufacturing processes, as described in the company's 9001 ISO management procedures.

WARRANTY

We undertake to supply, free of charge, new parts in place of parts which break or wear excessively through faulty material or bad workmanship within SIX months after delivery, provided such faulty parts are returned to us carriage paid, for examination. But we are not liable for labour, or any loss or damage direct or consequential, nor responsible for any accident, or in any way for the effect of any accident, whether due to defective material, workmanship or otherwise, and our guarantee does not apply to defects which in our opinion are caused by accident, wear or tear, misuse or neglect, including the use of unsuitable or dirty lubricants, or by interference with the construction of the machine as completed by us.

Your obligation as the Owner is to give the machine proper attention and care, in accordance with the guidelines given in this OWNER'S MANUAL PARTS LIST>

We reserve the right to make changes in design, and changes or improvements upon our product, without imposing any obligations on us to install the same on products there-to-fore manufactured.



FERTILISER SPREADER HFS 502



Serial number

The Serial and Model Numbers are stamped on the frame of your FERTILISER SPREADER.

For future reference, record the numbers below.

ALWAYS quote them when ordering spareparts.

MODEL No.	
SERIAL No.	
Date Purchased	

We hope you will be happy with your **HOWARD** Fertiliser Spreader. Treat it well - and it will serve you diligently for many years to come. Should you encounter problems - or have questions in respect of fertiliser spreading - please feel free to contact us or consult our dealers.

Notes:

- Continuous R & D may result in the technical contents of this Manual not always being identical to the specifications for the latest model delivered. HOWARD in ASIA since 1962.
- For more details and technical support, consult our web-page: www.howardmy.com

HOWARD Alatpertanian Sdn. Bhd. 2, Jalan Perusahaan 3 Batu 20, 48000 RAWANG Selangor, W. Malaysia Tel: (6 03) 6093 1010

Fax: (6 03) 6092 1010 E-mail: howardmy@tm.net.my

Spare Parts Direct Line : (6 03) 6093 6363

SAFETY PRECAUTIONS & OPERATING INSTRUCTION

Before use

- Ensure operators have read and are familiar with instructions contained in this manual.
- Consult the Tractor Manufacturer's Manual for instructions on mounting implements and safe working methods.
- Ensure the FERTILISER SPREADER is standing on firm, level ground and is properly supported.
- Ensure the SPREADER is set parallel to the ground, when looking from the back - this is to ensure even spread on both sides.
- Check that the hopper is free from all obstacles, like caked fertiliser and stones, this will avoid damage to the hopper and stirrer mechanism.
- Make certain that the quadratic casing, thrower, stirrer and universal drive shaft are correctly fitted and operative.
- Ensure the work area is clear of bystanders.
- Inspect the work area for obstructions which may constitute a hazard.
- Disengage all clutches and shift into neutral prior to starting the tractor engine.
- Inform your operator to use the tractor hand throttle and not the foot throttle.
- Inform your operator to run the tractor engine speed according to tractor manufacturers guidelines in order to achieve 540 PTO rpm for operating the FERTILISER SPREADER HFS502.

During use

 Raise the SPREADER until the universal drive shaft is parallel to the ground level, then engage the PTO drive before moving forward at a speed suitable for prevailing conditions.

As a general guide, the more unfavourable the land conditions are, the SLOWER the tractor forward speed should be to avoid equipment damage...

- Observe all safe driving procedure such as reducing speed on slopes and sharp turns.
- Avoid working on ground where there is a risk of the tractor overturning.
- Do not operate across the face of slopes.
- ALWAYS maintain constant height of the SPREADER above ground level.
- The universal drive shaft must not exceed an angle of 10°. As a general guide, the knocking sound of the drive shaft indicates that it has been over-lifted.

After use

- Disengage the PTO drive when transporting the SPREADER or not in use.
- Inspect the SPREADER for damage and that the hopper is clear of all fertiliser. (Caked fertiliser will break Stirrer and transmission).
 If possible, give the machine a good wash to ensure long machine service life.
- Check that all bolts, nuts and fasteners are tight.
- Carry out lubrication and maintenance as detailed in this manual.

Always

- Disengage the PTO drive shaft before raising or lowering FERTILISER SPREADER.
- Observe the limits concerning weight distribution on the front and rear axles to avoid lifting of front axle.
- Wear substantial or safety footwear.
- Avoid loose clothing which may be caught in moving parts.
- Wear earmuffs or earplugs. Prolonged exposure to noise can cause impairment or loss of hearing.
- Wear gloves when handling worn implements or parts with sharp edges.
- Use the implement only for the purposes for which it was designed, tested and in accordance with the instructions contained in this manual.
- Interpret "left" or "right" as the left or right hand of the operator when sitting on the tractor seat and facing forward.
- Ensure the SPREADER is not operated by children or untrained persons.
- Use the sieve to remove rocks, nails, plastic sheets, etc. that could damage the machine.
- Do not use wet/moist fertiliser. This will clog up the fertiliser flow in the hopper.

NEVER

- Drive long distances with a filled hopper as the fertilizer may become compacted.
- Touch any moving parts of the implement or parts which may be hot from operation.
- Allow passengers on the tractor or implement when operating.
- Check oil levels whilst the implement is running.
- Carry out cleaning, lubricating, adjustments or repairs to a mounted implement unless
 the tractor engine is stopped and the implement firmly supported or lowered to the
 ground.
- Leave the tractor seat unless the implement is lowered, the PTO drive disengaged, the gear shift in neutral, the brake applied, the engine stopped and the ignition key removed.
- Remove the universal drive shaft safety (plastic) guard. The corrosive attack of the fertiliser on the bare universal drive shaft may cause malfunction in due time.

SPECIFICATION	FERTILISER SPREADER HFS502
Tractor HP, recommended	Min. 20
Linkage, three-point	Cat. I / II
Mounting	directly rear mounted
Weight	130 Kgs
Spreading Range, metres - Granulates - Powder	8 - 14 6 - 10
PTO/Universal Drive Shaft	A4
PTO (rpm)	540
Hopper Capacity	500 Kg Max 10 bags { 50 Kg/bag }
Other Standard Features	with sieve

CAUTION:

NEVER OPERATE THE FERTILISER SPREADER HFS502 WITHOUT THE FRONT END WEIGHT ON TRACTOR HP OF 20 TO 45.

UNIVERSAL / PTO DRIVE SHAFT

BEWARE!!!

- Raising and lowering of the SPREADER will result in the telescopic movement of the PTO Drive Shaft Assembly. Please ensure that it does not jam or become disengaged.
- As a general rule, the Outer Cardan Tube and the Inner Cardan Tube must be at least half engaged (minimum 21 cm).
- ♠ The more the Outer and Inner Cardan Tubes are engaged, the longer the service life of the PTO Drive Shaft Assembly is, besides ensuring optimum power transmission.

Fitting of the Universal Drive Shaft

- Periodical oiling will ensure easy operation of the Lock Pin Kit sitting at the side-end of the PTO Yoke Assy. of the Drive Shaft.
- When fitting this Drive Shaft, ensure that the Lock Pin Kits are properly seated in the grooves of the PTO SHAFT of the tractor and the INPUT SHAFT of the SPREADER.

Also ensure that the Safety (Plastic) Guard of the Drive Shaft does not foul the tractor PTO Guard.

Maintenance of Universal Drive Shaft

- ▼▼▼ Cleanliness will help prolong the life span of the Drive Shaft.
- H Daily grease Cross Journals until grease comes out of the 4 cups.
- H Inspect Cross Journals periodically and replace them when necessary.
- He Daily smear a layer of grease on the Cardan Tubes.
- Apply a coat of grease to the inside splines of the PTO Yokes to ease assembly and disassembly.

GEARBOX

★ If there is sign of oil leak, check oil level IMMEDIATELY. Otherwise, weekly check would suffice. Top up with SAE 140 Gear Oil if necessary. ♠ If machine is newly installed, AFTER FIRST 50 HOURS OF OPERATION, flush and refill with SAE 140 Gear Oil until it flows out of the Oil Level Hole.

GS GS

SPINNER

- Stainless Steel circular Spinning Disc mounted with 4 Stainless Steel Throwers, preset to uniform distribution pattern.
- The Disc has pre-drilled settings for alternative spreading configurations.

STIRRER

An in-built Stirrer will ensure that the dry fertiliser does not clog and provide even flow onto the Spinner Disc.

FRAME

X Sturdy reinforced steel tube Frame with threepoint tractor linkage Cat. I / II.

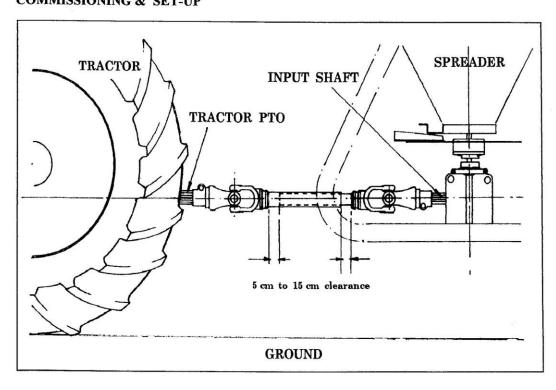
HOPPER

The fibreglass Hopper is easy to clean and is superior to conventional metal hoppers in terms of durability. It has a capacity of 500 Kgs with Hopper Extension fixed as standard.

CONTROLLER LEVER

Ω Spreading density is adjusted by a calibrated control lever within easy reach from the tractor seat.

COMMISSIONING & SET-UP



COMMISSIONING & SET-UP (Continued)

- Disconnect PTO Drive Shaft (Part No: 204057151) from Input Shaft (Part No: 212.450.110) of the HFS502 gearbox.
- Now, mount HFS502 to the tractor 3 point linkage.
- Adjust tractor top link until ground parallelism to HFS502 main frame is obtained.
- Use tractor hydraulic lever to lift HFS502 until the universal drive shaft is parallel to the ground level.
- The PTO Drive Shaft mainly consists of the Outer Half Shaft c/w PTO Yoke (Part No: 204056876) and Inner Half Shaft c/w Shear Bolt Torque Limiter (Part No: 204056877). Separate both the Half Shaft Assemblies.
- Now, connect Inner Half Shaft Assy. (Part No: 204056877) to Input Shaft of the HFS502 gearbox.
- Then, connect Outer Half Shaft Assy. (Part No: 204056876) to Inner Half Shaft Assy. Part No: 204056877).

- connect Outer Half Shaft Assy. (Part No: 204056876) to Tractor PTO.
- If PTO Drive Shaft is too long, take note of the length of cut required during this exercise. Beware of the length of cut. Excessive cut will lead to disconnection of both Half Shaft Assemblies when HFS502 is fully lowered at ground level.
- 10. Disconnect Inner Half Shaft Assy. (Part No: 204056877) from Input Shaft of HFS502 gearbox. Cut away the required length from Outer Cardan Tube of the Outer Half Shaft Assy., Inner Cardan Tube of the Inner Half Shaft Assy., Outer Guard (Part No: 204055990) and Inner Guard (Part No: 204055989) and follow specification as shown in the diagram in Page 4.
- Repeat all the above instruction accordingly until obtaining the dimension shown in the drawing.
- 12. Beware of the tractor hydraulic linkage movement. Never move the lever quickly from the tractor hydraulic quadrant as this will result in instantaneous quick motion at the linkage end. Move this lever slowly bit by bit along the quadrant to take marking for the PTO Drive Shaft cut off length.

**HOWARD **HOWARD

PREPARATION AND OPERATION OF THE SPREADER

ATTACHING THE FERTILISER SPREADER TO THE TRACTOR

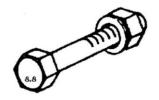
Position the tractor lower link ball joints in line with the mounting pins.

Connect the tractor lower links, left hand link first, securing with Cotter Assemblies, adjusting the right hand tractor lift arm if necessary.

Fit the tractor upper link and secure. Attach the PTO Drive Shaft to the tractor and Fertiliser Spreader ensuring the quick release pins engage the spline shaft grooves of the tractor PTO shaft and the Input Shaft of the Spreader Gearbox.

It is VERY IMPORTANT that the SHEAR BOLT TORQUE LIMITER is attached to the Input Shaft of the Spreader Gearbox SO THAT ANY SHOCK-LOADS are arrested BEFORE THEY REACH THE TRACTOR PTO. In other words, the Shear Bolt will shear off BEFORE any tractor part is damaged, which is much more costly to replace.

Grade 8.8 High Tensile Shear Bolts are used to ensure setting calibration. When replacing sheared Shear Bolts, ensure that the unthreaded length is correct and that the Bolt Head has the mark 8.8 - better still use GENUINE HOWARD Shear Bolts for replacement.



Attach the PTO Drive Shaft Guard Chains to the tractor and the Spreader.

Attach stabiliser bar or check chains to limit sway to 5 cm. Adjust tractor linkage to level the Spreader laterally and longitudinally.

Before engaging the tractor PTO, lift the Spreader on the hydraulic lift linkage to a height where the PTO Drive Shaft is parallel to the ground. If this is not possible, ensure that the PTO Drive Shaft angle does not exceed 10° and set the limit stop on the hydraulic POSITION CONTROL quadrant. (Note: The POSITION CONTROL quadrant and not the Draft Control quadrant).

Finally check that the PTO Drive Shaft does not "bottom" or separate by raising and lowering the Spreader.

CHECK GEARBOX OIL BEFORE OPERATION

With the Spreader on level ground and the tractor engine turned off, key removed, open the Oil Level Plug to a point where the oil oozes out. This indicates that the Gearbox has sufficient oil, tighten back the Oil Level Plug. If no oil oozes out, open the Oil Level Plug completely and check that there is sufficient oil in the Gearbox, top up if necessary. Unless there is sign of oil leakage, weekly check is sufficient.

LOADING OF FERTILISER

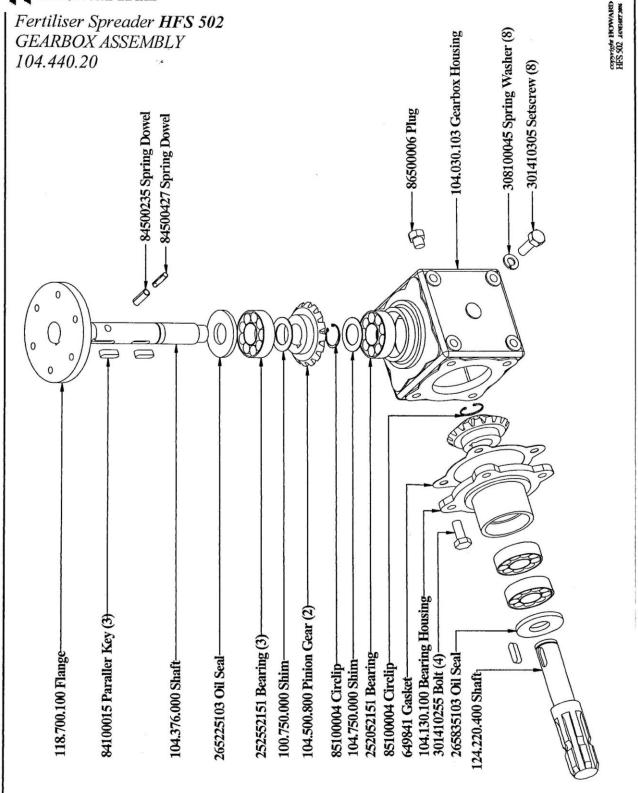
With the Spreader sitting on the ground, the tractor engine turned off, the fertiliser flow control Limiter Plate closed, the Top Sieve in place, pour the fertiliser onto the Top Sieve to remove any unwanted materials. If any fertiliser hardens into lumps, break them up before putting into the hopper.

When pouring fertiliser, DO NOT FACE against the wind. This is to avoid any fertiliser being blown onto the face.

OPERATING THE FERTILISER SPREADER

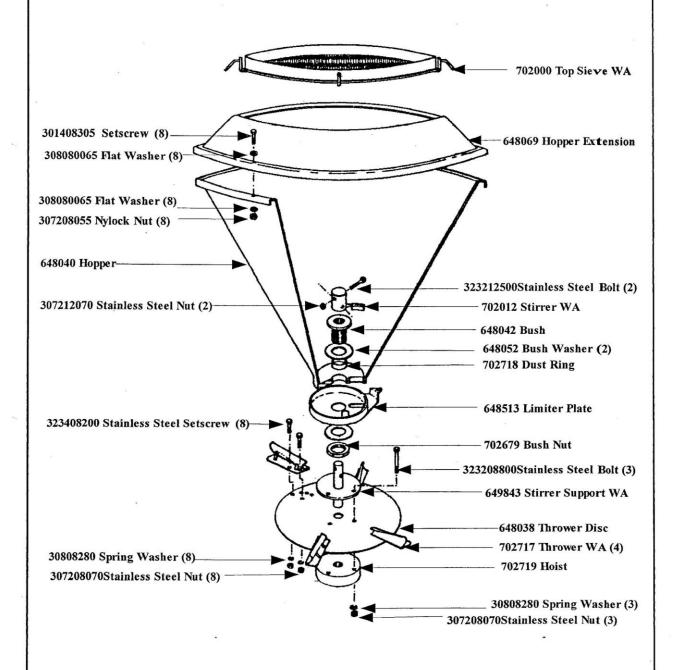
Raise the Spreader to the pre-set height (see the pre-set hydraulic POSITION CONTROL quadrant mentioned above), adjust the fertiliser flow control lever (Adjuster Lever) to the desired position, **engage the tractor PTO at the idling engine speed, then slowly rev the engine to 540 RPM** and move forward at a speed suitable for prevailing conditions.

Always operate the Spreader against the direction of the wind

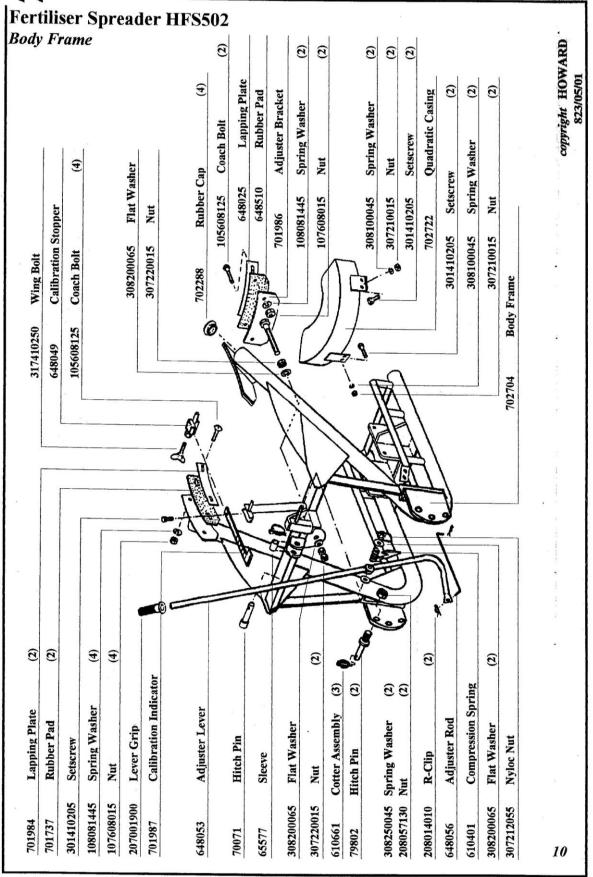




Fertiliser Spreader **HFS 502** Hopper



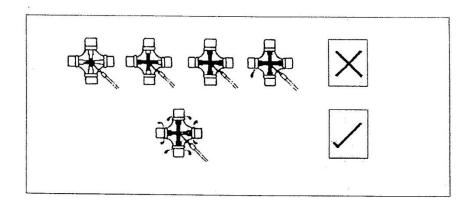




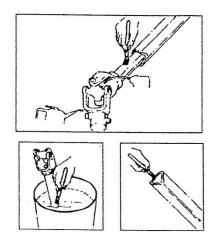
MAINTENANCE

OF UNIVERSAL DRIVESHAFT

- 1. Recommended use high quality grease LITHIUM BASE (type NL G2).
- 2. Make sure to pump grease into the cross journal nipple until the grease came out from all cups.



- 3. Make sure to dismantle both shaft assembly and then to brush at surface of inner and outer shaft with GRAPHITE POWDER OR MOLYBDENUM DISULPHIDE GREASE.
- 4. Difficulty to move the inner and outer shaft when operation will cause the serious damage to the shaft or output tractor shaft. If the surfaces of inner and outer shaft are dirty, we advise customer to clean it twice per day.



5. Please refer to the PTO owner's manual for further understanding.

HOWARD DEALERS & SPARE PART STOCKISTS

PERLIS

PPN Perlis, Kangar Sin Keat Seng, Kangar PPK Mata Ayer, M.Ayer

KEDAH

Nafas Jentera, A.S. Pertanian Utara, A.S. Sime Darby Ind, A.S. Hock Lean, Jitra TAE, Jitra TAE, Pendang Utara Agritrak, A.S.

PULAU PINANG

Eik Seng, B'worth Kien Seng, B'worth Sime Darby Ind, S. Prai Sime Kubota, B'worth TCIM, B'worth UMW, B'worth

PERAK

Benefarm, Ipoh Felcra Process, ess, Kg. Gajah PPN Perak, Ipoh Kej. Pertanian, T. Intan Overseas Union, T. intan Sime Kubota, T.Intan Sime Darby Ind, Ipoh TCIM, Ipoh UMW, Ipoh

SELANGOR

BH Agri, K.L Palm Mach, Kepong Yik Soon, Kepong Yik Soon, Kepong Teck Seng, Sg. Besi Puncak Emas, B. Caves S.J.I, Klang Asia Turfquip, P.J. Bar Formula, P.J. Bar Formula, P.J.
Mareagsue, P.J.
Nafas Jentera, P.J.
Eurostar, Puchong
Minda Agri, Puchong
Sime Darby Ind, Puchong Sime Kubota, Puchong Sin Hup Hin, Sekinchan MZS Power, Shah Alam TCIM, Shah Alam UMW, Shah Alam

SABAH

LSC K.K. Kong Seng, K.K. Lensoon, K.K. Palm Mach, K.K. Sime Kubota, K.K. Sin Ngiap, K.K. TCIE, K.K. Sime Darby, K.K. UMW, K.K. Wilpors, K.K. Win Hin, K.K Sime Darby, Lahad Datu All Planters, Lahad Datu ATSB, Lahad Datu Benefarm, Lahad Datu Eurostar, Lahad Datu Palm Mach, Lahad Datu Nafas Jentera, Lahad Datu Sime Kubota, Lahad Datu Solid Firm, Lahad Datu TCIE, Lahad Datu Sime Darby, Labuar ATSB, Sandakan Benefarm, Sandakan Bri-Trail, Sandakan Eurostar, Sandakan Hup Seng, Sandakan Intan Karang, Sandakan TCIE, Sandakan Sime Darby, Sandakan Sime Kubota, Sandakan UMW, Sandakan

LP Tractors, Tawau Sime Darby, Tawau UMW, Tawau NEGERI SEMBILAN

Bahau Auto, Bahau Emdek, Seremban TCIM, Seremban

Wilpros, Sandakan

ATSB, Tawau

Eurostar, Tawau

MELAKA

CS Agriparts, T.M .Jaya TCIM, T.M. Jaya Sime Darby, T.M. Jaya PPN Melaka, Melaka Segamat Agri, Krubong

JOHOR

Asia Turfquip, J.B Hock Guan Hin, J.B. Seriintan, J.B. TCIM, J.B. Teck Seng, J.B. Sime Darby Inds, J.B. UMW, J.B. Ah Bee, Kluang Hiap Thye, Kluang Kang Sang, Kluang Kluang Berjaya, Kluang Maju Estate, Kluang Nafas Jentera, Kluang Palm Mach, Kluang Sime Darby Inds, Kluang Eurostar, Segamat Kian Huat, Segamat Segamat Cycle, Segamat Wabco, Skudai JVR, Ulu Tiram

KELANTAN

Bogam K B Hock Hoe Hin, K.B. K.B. Jaya, K.B. Eurostar, G. Musang Palm Mach, G. Musang Lea Thong, K.B. Minda, K.B. Nafas Jentera, K.B. Sime Darby Inds, K.B. PPK K. Sepat, P.Mas Sime Kubota, W. Bharu

TERENGGANU

J & J Machinery, K.T. KPT Peladang, K.T. K.T. Inds, K.T. Nafas Jentera, K.T. TADC, K.T. UMW, K.T.

PAHANO

Yi Cheng, Gambang Eurostar, Kuantan Nafas Jentera, Kuantan Sime Kubota, Kuantan TCIM, Kuantan Tractors M'sia, Kuantan UMW. Kuantan M'tab Agri, Mentakab

SARAWAK

Benefarm, Miri Sime Kubota, Miri TCM. Miri Sime Darby, Miri UMW, Miri Intan Karang, Bintulu Pan Sarawak Bintulu Sime Kubota, Bintulu Sime Darby, Bintulu UMW, Bintulu Benefarm, Kuching JN Inds, Kuching Sime Kubota, Kuching TCIM, Kuching Sime Darby, Kuching UMW, Kuching Pan Sarawak, Sibu Sime Kubota, Sibu TCM, Sibu Sime Darby, Sibu Pansar, Sibu

UMW. Sibu

Rawang

BRUNEI Hock Hung Hing, BSB MPS Trading, BSB

Tractors M'sia, BSB INDONESIA

Agrisarana Altrak 1978 Bina Pertiwi Pioneer Trading Probesco SAHABAT Agritama Satrindo Traktor Nusantara Capella, Medan SAHABAT, Medan

SINGAPORE

ATS Tractors S'pore UMW

PHILIPPINES

Alpha Machinery KAMPI Major Tractors, Davao Sime Darby Up-Town, Pasig City

THAILAND

Phong La-or Patana Suptawee

INDIA

Farm Implements

SRI LANKA Brown & Co.

Hovael

BANGLADESH PAKISTAN VIETNAM / CAMBODIA

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Bala Service Manager



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C.K. Lim Parts Manager





Rafi Production Manager



Ibrahim



Maarof Foreman Assembly



Keshal Engineer



Yamin Engineer



Samsol Training & Demo

ADMINISTRATION & QA



Diana



Zamary



Draughtsman



Mustafa Material QC





A. Nielsen Managing Director



HOWARD



In Southeast Asia since 1962



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