### STATE INSPECTION

### OF AGRICULTURAL MACHINERY

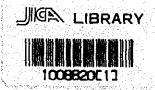
in Japan

MARCH 1968

THE INSTITUTE OF AGRICULTURAL MACHINERY
OVERSEAS TECHNICAL COOPERATION AGENCY.

Technical Handbook

# STATE INSPECTION OF AGRICULTURAL MACHINERY IN JAPAN



MARCH 1968

THE INSTITUTE OF AGRICULTURAL MACHINERY
OVERSEAS TECHNICAL COOPERATION AGENCY

### PREFACE

We consider it highly significant for us to have this opportunity to issue this hand book, one of the OTCA Technical
Hand Book Series, for the introduction of the "State Inspection
Standards for Agricultural Machinery" through the close cooperation of Ministry of Agriculture and Forestry and the
Institute of Agricultural Machinery in response to increasing
request from overseas countries for issuing of the abovementioned standard introduction.

We sincerely hope that this publication will be suggestive and useful for those concerned in any way prove helpful for the development of agricultural mechanization in your respective country.

Shin-ichi Shibusawa
Director General
Overseas Technical Cooperation Agency

### Japanese Text

Established by the Institute of Agricultural Machinery

Date of Establishment: March, 1964.

Date of Revision: March, 1967.

### PREFACE

National inspection for agricultural machinery will be an effective lever when we intend to promote our agricultural productivity and to improve each farmer's agricultural management keeping up with the social and economical conditions which are suddenly changeable.

In introducing of agricultural machinery, national inspection for them shall be carried out by the State desiring the production and spread of superior machinery of which the farmer can handle with a safe conciousness.

Main characters of the inspection are as follows:

- 1. Testing shall be carried out by the Institute of Agricultural Machinery as an agent for the State.
- 2. The kinds of machinery for testing shall be specified by the Ministry of Agriculture and Forestry every fiscal year and testing shall be made only for them.
- 3. The inspection is designated as Type Inspection, that is, a single success in the inspection is enough for the same type of machinery.
- 4. There are four items in the inspection, which are performance, mechanism, durability and operational difficulties of machinery.

In carrying out of the State inspection, the testing methods and the standards to make the decision of the test results are specified in accordance with each type of agricultural machinery

and printed as an independent volume. There exist much inconvenience in looking over the whole inspection procedure as being several kinds of related laws and regulations which state the application for testing and application forms after passing the inspection.

In order to solve these inconvenience, we have lumped together the necessary documents referring to the State inspection for agricultural machinery and published the first issue of it as the inspection materials No. 1 in March, 1964. However, in accordance with the afterwards progress in agricultural mechanization, the new "Principal testing methods and standards for new types has set up and a partial amendment has been made in the old one.

Under these situations, we herewith present this revised edition before you and sincerely wish this will be helpful to readers concerned.

Director
THE INSTITUTE OF AGRICULTURAL MACHINERY

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I Standards and Procedures of the Inspection and Forms for the Inspection Record Sheet

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### I - 1. AGRICULTURAL TRACTORS

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(Walking Type)

# I - 1 AGRICULTURAL TRACTORS (WALKING TYPE) (Date of Public Notice in Official Gazette: October 22, 1962.)

### 1. Scope

This standard specifies testing methods and procedures of inspection of Walking Type Tractors for agricultural use, inclusive of Tractor that can be temporarily used for riding by the use of attachments (hereinafter referred to as the "Tractor").

### 2. Classification of Tractors

The classification of tractors shall be shown as follows:

### (1) Pull Type

The pull type means the tractor pulls various kinds of implements.

### (2) Power - Tilling Type

The power-tilling type means that has a tillage device (such as rotary, crank or screw blades), which is driven by the engine power.

### (3) Pull and Power - Tilling Dual Purpose Type

The pull and power-tilling dual purpose type means that can be used both as the Pull type and as the Power-tilling type (hereinafter referred to as the "Dual-Purpose Type").

### 3. Definition of Terms

The meaning of terms to be used in this standard shall be defined as follows:

### (1) Rated Horsepower

The term of the "rated horsepower" within the meaning of this standard shall be the rated horsepower which is
indicated on the specification sheet (hereinafter referred to
as the "specification") submitted by a manufacturer.

### (2) Rated Speed

The rated speed that is the indicated number of revolutions of the engine on the specification.

### (3) Applicable Work

The applicable work means that is mentioned as applicable work on the specification.

### (4) Operating Weight

The operating weight means the total weight with 80% of fuel tank capacity and with regular amount of cooling water and lubricating oil when the Tractor is at work.

### 4. Procedures of Inspection

### 4.1 Item to be Inspected

The inspection shall be carried out by the following tests and investigations:

- (1) Verification of the Specification
- (2) Field Performance Test
- (3) Handling Test
- (4) Continuous Running Test on the Bench
- (5) Inspection after Disassembling

### 4.2 General Conditions for Inspection

(1) The tractor to be put on the test (hereinafter referred to as the "Tractor on test") shall have been run-in enough prior to the test. The preliminary running for each test shall be within 30 minutes.

### (2) Fuel and Lubricating Oil

Fuel and lubricating oil shall conform to the specification and be easily available at the market. The regular amount of lubricating oil shall be filled before the test and lubricating oil shall not, as a rule, be exchanged during the entire test.

### (3) Measuring Instruments

The instruments to be used for measuring shall have been checked and calibrated prior to the measurements, and shall be capable of taking the following minimum scale and accuracy.

Main purpose	Kind of	Required minimum
	instrument	scale and accuracy
Measurement of	metal - measure	1 mm
tilling depth and		
width		
Measurement of	platform scale	below 1 kg.
tractor's total		
weight		
Measurement of	chronometer	with minimum
hours		scale not more

Main purpose of use	Kind of instrument	Required minimum scale and accuracy
Measurement of number of re- volutions	Hasler tacho- meter	capable of read- ing 1% of meas- ured value
Measurement of temperature	centigrade thermometer	capable of taking finer scale than 2°C
Measurement of fuel consumption	measuring cylinder	below 10 cc
Measurement of load	platform scale	with scale capable of indicating up to 1% of applied load

### (A) Suspension of Test

When one of each test stops more than 3 times or longer than 30 minutes, the test shall be stopped. However, the test which may be stopped irrespective of the manufacturer's responsibility shall be recovered.

### 4.3 Methods of Test and Investigation

### 4.3.1 Verification of Structure

### (1) Object

The object of this investigation is to ascertain the mechanism, main dimensions, weights and equipments for the Tractor on test in comparison actual things with the said items indicated on the specification.

### (2) Place

The inpenetrable plain concrete surface shall be used for this investigation.

### (3) Items to be Investigated

### 1) Dimension

Overall length
Overall width
Overall height
Weight at work

### 2) Coupling Part for Implements

Shape and dimension of hitching or mounting part for the implements.

### 3) Engine

Type, rated horsepower, rated speed, kind of fuel, capacity of fuel tank, cooling system, number of strokes, starting system and other necessary items.

### 4) Power Transmission System

The power transmission from the engine crankshaft to the final shaft.

### 5) Type of Clutch

Main clutch, steering clutch and tilling clutch.

### 6) Number of Speed-Positions for Transmission

Number of speed positions for the main transmission

Number of speed positions for the auxiliary transmission

Number of speed positions for the tilling transmission

- 7) Mechanism of Transmission Gear

  Kind of lubricating oil and its recomended amount
  for filling.
- 8) Type of Running Part

  Track or tread range

  Adjustable range of track or tread
- 9) Others

Tilling width, kinds and number of blades, available auxiliary blades or not, special devices for tilling the levee and other necessary items.

### 4.3.2 Field Performance Test

(1) Object

The object of this test is for ascertaining the field performance of the Tractor on test.

(2) Kinds of Field Operation Tests
Plowing
Tilling

Intercultivating and ridging

(3) Plowing Test

This test shall be applied to the Tractor, for which the plowing work is mentioned as applicable field work in the specification.

l) Place

The test shall be carried out on the paddy field where mechanical structure of soil and moisture content are medium natured.

### 2) Testing Method

### (a) Testing equipment

The Tractor on test shall be equipped with the implements mentioned in the specification. The wheels and balance-weight to be used for the tractor should be available at the market as common attachments for the tractor.

### (b) Plowing method and field working passage

The return plowing shall be done in the way of one-side converting with the reversible plow and gathering way with fixed (or common) plow in principle, for more than 15 passages inclusive of the opening work. The plowing work of headland shall be omitted.

### 3) Items to be Measured

- (a) Travelling speed
- (b) Time required for turning
- (c) Depth of plowing
- (d) Width of plowing
- (e) Working hours
- (f) Working area
- (g) Fuel consumption
- (h) Temperature of fuel
- (i) Atmospheric temperature

### 4) Items to be Investigated

- (a) Turning of furrow
- (b) Throwing of furrow

- (c) Pulverization
- (d) Surface leveling of the plowed land
- (e) Other necessary items

### 5) Calculating Method

The required hours for the plowing work converting into into 10 ares of the field can be calculated by the following formula:

$$T = (\frac{55}{V} + t) \frac{18.2}{60 \text{ b}}$$

where,

T: required hours for plowing
10 ares of the field (min)

t : average required hours for turning (sec)

V: travelling speed of the tractor (m/sec)

b : average width of furrow (m)

$$L = \frac{\ell T}{T_0}$$

where.

L: fuel consumption per 10 ares  $(\ell)$ 

 fuel consumption for the plowing work in the total area tested

(1)

T: working hours per 10 ares (min)

T: required hours for the plowing work in the total area tested (min)

### (4) Rotary Tilling Test

This test shall be applied to the Tractor, for which the rotary tilling work is mentioned as applicable field work in the specification.

### 1) Place

The place for this test shall be selected the same place as stipulated in 4.3.2-(3)-1).

### 2) Testing Method

### (a) Testing equipment

The Tractor on test shall be equipped with the implements mentioned as the equipments for the rotary tilling work in the specification. The wheels and balance-weight to be used for the tractor should be available at the market as common attachments for the tractor.

### (b) Tilling method and number of passes

More than 10 passages shall be carried out in the plain paddy field in the form of successively connected row or every other row. The head land shall be omitted.

### 3) Items to be Measured

- (a) Travelling speed
- (b) Required time for turning
- (c) Depth of tilling
- (d) Actual tilling width and overall width of the tilling work
- (e) Exposure of stubs
- (f) Working hours

- (g) Working area
- (h) Fuel consumption
- (i) Temperature of fuel
- (j) Atmospheric temperature

### 4) Items to be Investigated

- (a) Working condition
- (b) Untilled land in the working area
- (c) Pulverization
- (d) Surface leveling of the tilled land
- (e) Other necessary items

### 5) Calculating Method

The required working hours and fuel consumption converted into 10 ares can be able to obtained with the formula in 4.3.2-(3)-5). However, the average width of tilling shall be calculated by the following formula:

$$b = \frac{W}{P}$$

where,

b: average width of tilling (m)

W: overall width of the total tilling work (m)

n : number of passages

### (5) Intercultivating and Ridging Test

This test shall be applied to the Tractor to be used mainly for the field work of intercultivating and ridging.

### l) Place

The place to be used for this test shall, as a rule,

be selected from the upland fields where wheat is grown. However, the place for ridging test shall be selected in the land where have been intercultivated.

### 2) Testing Method

- (a) Number of passages and method of field work

  More than 5 passages shall be carried out, but
  the method of field work shall not be prescribed
  particularly.
- (b) Width of intercultivating

  Approx. 55 Cm and the minimum width of intercultivating of the Tractor on test.
- (c) Depth of intercultivating
  Approx. 6 Cm
- (d) Depth of ridging

12 Cm and the maximum depth to be obtained by the Tractor on test.

- 3) Items to be Measured and Investigated
  - (a) Travelling speed
  - (b) Time required for turning
  - (c) Depth of intercultivating and ridging
  - (d) Damage to plant
  - (e) Profile of the ridge

### 4) Calculating Method

The required working hours converted into 10 ares (in the case of width is 60 Cm) can be calculated by the formula of 4.3.2-(3)-5), but the tilling width "b" shall be 60 Cm in this calculating method.

### 4.3.3 Handling Test

### (1) Object

The object of this test is for ascertaining ease or otherwise of handling for the Tractor on test.

### (2) Field Work to be Tested

The field work to be tested shall conform to the mentioned field work as applicable in the specification.

- 1) Plawing
- 2) Harrowing
- 3) Power tilling
- 4) Intercultivating and ridging
- 5) Transportation work

### (3) Place

The field work for plowing, harrowing and power tilling shall be done at the same conditioned field stipulated in the test of 4.3.2-(3)-1). The ridging work shall be carried out in the upland field and transportation work on the roadable ground.

### (4) Testing Method

The investigation shall be required to do by more than two investigators operating the Tractor on test.

### (5) Items to be Investigated

- 1) Easiness of handling and stability when the tractor is travelling and turning
- 2) Easiness of handling the levers
- 3) Safety
- 4) Vibration
- 5) Easiness of replacing and adjusting the parts

### 4.3.4 Continuous Running Test on the Bench

### (1) Object

The object of this test is to ascertain the operating condition, and that there is no abnormality or trouble under the continous running condition of the Tractor on test.

### (2) Testing Equipment

The Tractor on test, bare of wheel or track, shall be fixed on the frame and driven by the engine mounted on the Tractor on test. Brake load is applied on rotary tilling shaft or wheel axle by a Prony brake.

### (3) Testing Method

### 1) Pull Type

- (a) The brake load of 80% of the rated engine horsepower shall be applied on a wheel axle.
- (b) Ratio of loads on left and right axles shall correspond individually to that of alloted loads on each axle when the Tractor is at standstill and average plowing depth. The ratio for the Tractor, however, plowing work of which is not mentioned in the specification shall be 1 to 1.
- (c) The engine shall be run at rated speed and the change-gear position shall be at the largest-ratio-reduction within the plowing speed range mentioned in the specification.
- (d) Duration of continuous running shall be for 5 hours. However, loads on each axle shall be interchanged after 2.5 hours, except the Tractor for

which plowing work is not mentioned on the specification.

### 2) Power Tilling Type

- (a) The brake load of 80% of the rated engine horsepower is applied on the rotary tilling shaft.
- (b) The engine shall be run at rated speed and change-gear position shall be at the largest-ratio-reduction within the tilling speed range mentioned in the specification.
- (c) The wheel axles shall be driven under no load.
- (d) Duration of running hours shall be for 5 hours continuously.

### 3) Dual-Purpose Type

- (a) For this test, there shall be two kinds of tests, which are wheel loading test and tilling shaft loading test.
- (b) The method of loading on wheel axles shall be the same as stipulated in 4.3.4-(3)-(b).
- (c) The method of loading on tilling shaft shall conform to that of the Power tilling type.
  - (d) Duration of continuous running shall be for 3 hours in either case. However, load on each wheel axle shall be inter-changed after I.5 hours in case of loading on wheel axles.
- 4) Items to be Measured and Investigated

The following measurements and investigations shall be made during the continuous running.

- (a) Temperature of lubricating oil
- (b) Surface temperature on the bearings
- (c) Room temperature
- (d) Vibration
- (e) Noise
- (f) Oil leakage
- (g) Other development of irregularities and abnormalities

Remarks: In the case when the engine is stopped during the test, which is not more than 2 times and not longer than 30 minutes of total hours for the running-stop, it may be permitted to continue the test by extending the test by the length of time the engine was stopped.

### 4.3.5 Investigation after Disassembling

This investigation shall, as a rule, be made immediately after the continuous running test on the bench.

### (1) Object.

The object of this investigation is to ascertain that there is no development of irregularities for the Tractor on test which has undergone the continuous running test on the bench.

### (2) Items to be Investigated

This investigation shall be made for ascertaining of any abnormalities on the Tractor on test after disassembling completely the Tractor tested, and if necessary, further

investigation and measurement shall be taken against fitting condition, hardness, processing and touch degree of finishing, etc.

### 5. Standards to Pass the Inspection

The decision of inspection for Walking Type Tractor for agricultural use shall conform to the following standards and shall be required to satisfy the respective requirement stipulated hereunder:

### 5.1 Performance Inspection

- (1) Average plowing depth in the test of 4.3.2-(3) shall be deeper than 14 Cm, but for the small pull type tractor, mainly to be used for intercultivating and ridging work shall be deeper than 12 Cm.
- (2) Average tilling depth in the test of 4.3.2-(4) shall be deeper than 14 Cm, but for the dual-purpose type should be over 12 Cm.
- (3) The required working hours per 10 ares in the test of 4.3.2-(3) and (4) should be within 120 minutes.

### 5.2 Durability Inspection

- (1) The durability inspection shall be required to satisfy the requirements, particularly in principal parts and parts which may be difficult to replace easily, as specified follows:
- (2) No abnormal abrasion
- (3) No oil leakage
- (4) No seizure

### 5.3 Handling Inspection

- (1) Handling condition shall not show any defects that may bring much fatigues to the operator in the test of 4.3.3.
- (2) No defects that may bring much dangerous feelings to the operator in the test of 4.3.3.
- (3) No defects that shall be the cause of difficulties to carry out the field work smoothly and to replace or adjust the parts in the test of 4.3.3.

Form 1. PULL-TYPE: For Plowing and intercultivate-ridging uses, but mainly plowing use.

# INSPECTION RECORD SHEET

Date:

THE INSTITUTE OF AGRICULTURAL

MACHINERY

Kind of agriculture Agriculture Tractor (Walking Type) Pull-Type

machinery

Certificate No.

Manufacturer's type designation Manufacturer's name and add.

1. Main Structure

(1) Dimension (inclusive of the engine, but no fitting with attachments)

	Remarks	Weight: (inclusive of appx. 80% of fuel, regular amounts of lubricating oil and cooling water.
	Weight	Kg
	Overall height	E O
Dimension	Overall width	Q <b>m</b>
	Ovorall iength	<b>E</b>

(2) Engine Mounted on the Tractor

	Remarks	Designated type at the time of inspection	
	Starting system		
	Cooling system		
	Stroke		
	Kind of fuel		the state of the s
	Rated revolu- tions	udı	
為基件為於 医人物学	Rated horse- power	Ps	

(3) Power Transmission System

(4) Type of Clutch

From the crankshaft From the first shaft to the first shaft to the wheel axle

Main clutch
Steering clutch

(5) Number of Change-Gear Positions

2]	Reverse	Posi-	tions
Total	Forward	Posi-	tions
Beit speed	change	Posi-	tions
Auxiliary	transmittion	Fosi-	tions
smission	Reverse	Posi-	tions
Main transin	Forward	Posi-	tions

(6) Lubricant

of power	Regular amount	
Main part of power transmission	Kind of oil	

(7) Equipment and its Weight according to the Field Work

Mork Test	Type of attachment	. Additional weight	Wheel	Gross Weight	Remarks
Plowing 2-(1) Field work		83		kg	
Harrowing (after plowing)					
Intercultivation Wheat (upland)					
Ridging Wheat (upland)					
Transportation	Trailor kg (carrying 350)				

(8) Other attachments

Summary of Inspection Record

Summary of Inspection Record

(1) Plowing Performance Test (See the attached sheet for the place of testing plot and soil property.)

The result of test made under the following conditions has marked deeper than 14 Cm in plowing depth, and the working time converted into 10 ares has been within 120 minutes (Inspection Standard)

	Depth of top soil		Cm	
Field Conditions	Space between stubs	rows x hills	Cm	
Dield (	Weeds growth			
	Degree of softness or	hardness		
	Date of test			

 ·			
	Size of wheel.		
		Belt speed-change	
	Change-gear positions	Auxiliary	
	Che	Main transmission	
	- 22		

Range of	Additiona!	al weight	100	ŀ	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Average	•	Time re-
tread or track	Front	Wheel	weight	l ype of	plow Flowing plowing	width of plowing	Kunning speed	quired for turning
	part							)
g	kg	84						

(2) Continuous Running Test on the Bench

The result of test made under the condition of 80% of break load application to the wheelaxle has not shown any abnormalities after carrying out the continuous running test on the bench for 5 hours.

Remarks	
Wheel axle Revolutions	rpm
Engine r.p.m.	udr ·
ed rle	
hange Break load Break load on of ratio applie wheel axle on wheel ax	
Speed change position	
Item	Conditions of test

(3) Reference records to the Handling (Showing the condition at the time of inspection.)

3		
	Others	
Adjusting method and	adjusting range of tread range	
Fitting	method of wheel	
Shape and	adjustment of handle	
Kind of	speed-change adjustment lever of handle	
Position of clutch lever	Steering	
Fosit	Main clutch	

Additional Remarks

From 2. PULL-TYPE: For intercultivate-ridging and plowing uses, but mainly intereultivate-ridging use.

# INSPECTION RECORD SHEET

Date:

THE INSTITUTE OF AGRICULTURAL

MACHINERY

Agricultural Tractor (Walking Type) Full-Type

Kind of agricultural machinery

Certificate No.

Manufacturer's type designation

Wanufacturer's name and add.

1. Main Structure

(1) Dimension (inclusive of the engine, but no attachment fitted on the tractor)

Dimensi	nsion				
Overall Overa length width	rall h	Overall height	weignt	Kemarks	
	Cm	Cm	kg	Weight; (inclusive of appx, 80% of fuel	fuel
			)	regular amounts of lubricating oil and	and
	-			COOTING Water.	-

(2) Engine Mounted on the Tractor

Remarks	Designated type at the time of inspection
Starting	
Cooling system	
Stroke	
Kind of fuel	
Rated revolu- tions	rpm
Rated horse- power	Å

(3) Fower Transmission System

(4) Type of Clutch

Steering clutch

Main clutch From the crankshaft | From the first shaft to the first shaft | to the wheel axle

(5) Number of Change-Gear Positions

Main tran	ransmission	Auxiliary	Belt speed	Total	tal
Forward	Reverse	transmission	change	Forward	Reverse
Fosi-	Posi-	Posi-	Fosi-	Fosi-	Posi-
tion	tion	tion	tion	tion	tion

(6) Lubricant

	P
mount	
ular a	
Reg	
);!	
d of c	
i d	
	Kind of oil Regular amount

(7) Equipments and Weight according to the Field Work

Name of Field Work Test	Type of attachment	Additional weight	wheel	Gross Weight	Remarks
Plowing 2-(1) Field work		ĝ		, Kg	
Harrowing (after plowing)					
Intercultivation Wheat (upland)					
Wheat (upland)					
Transportation	Trailor kg (carrying 350)				

(8) Other attachments

(a) Intercultivating and Ridging. (See the attached sheet for the place of testing 2. Summary of Inspection Record
(1) Field Work Performance Test
(a) Intercultivating and Ridging.

ing time converted into 10 ares has been within 50 minutes (Inspection Standard). capable of doing the ordinary intercultivating and ridging practices and the workplot and soil property.) The result of test made under the following conditions has been marked as

		Field c	Field conditions	Change-g	Change-gear positions		1
Date of test	field work	Kind of	Sowing width	Main trans-	Belt speed-	Type of wheel and its size	Outside width of wheel
			inter-row	mission	change		
	Inter- cultivating						S C
	Ridging						

		<u> </u>
Time required for running	Ω	
Travel- ling speed	s/w	
Depth of inter-culti- vating and ridging	Ст	
Method of field work		
Kind of attachment		
Gross weight	Кg	
Additional weight	kg	

The result of test made under the following conditions has been recorded deeper than 12 Cm in plowing depth and the working time converted into 10 ares has been (b) Plowing. (See the attached sheet for the place of testing plot and soil property.)
The result of test made under the fallowing within 120 minutes (Inspection Standard).

ı——	1	<u>.:</u>
	Depth of top soil	Сm
Field conditions	Space between stubs rows x hills	CB
Field	Weeds	
	Degree of softness or hardness	
Date	of test	

Type of	wheel and its size	
	Belt Speed-change	
Change-gear positions	Auxiliary transmission	
<b>o</b>	Main transmission	

		<u> </u>	n de la la companya de la companya d
Travel- Time re-	quirea ior turning	Ø	tion
Travel-	pəəds	s/w	ad applica
Average	width of tillage	C	of break lo
Method	plowing		ns of 80%
Type of	plow		Running Test on the Bench of test made under the conditions of 80% of break load application has not shown any abnormalities after carrying out the continuous he bench for 5 hours.
Gross	weight		est on the le under to hown any or 5 hour
l weight	Wheel	Kg	1 11 - 14
Additiona	Front	8 <sub>y</sub>	(2) Continuous The result o to the wheel axil running test on t
Range of	track	Cm	(2) C T to the runnin

to the wheel axil has not shown any abnormalities after carrying out the continuous running test on the bench for 5 hours. The result of test made under the conditions of 80% of break load application

Item	Position of change-gear	tion Break load Ratio of of on loads ge-gear wheel axle wheel ax	Ratio of loads wheel axles	Engine r.p.m.	r.p.m. wheel axles	Remarks
Conditions of test		G 8				

(3) Reference Records to the Handling. (Showing the conditions at the time of inspection.)

			,
	Other		
Adjusting method and	adjusting range of	tread or track	
Fitting	method of wheel		
Shape and	of handle wheel		
Kind of	speed-change adjustment method of adjusting lever   of handle   wheel   range of		
Position of clutch lever	Steering	clutch	
Position of clutch lever	Main	clutch	

### INSPECTION RECORD SHEET

Date:

THE INSTITUTE OF AGRICULTURAL MACHINERY

Kind of agricultural Agricultums chinery

Certificate No.

Agricultural Tractor (Walking Type) Power Tilling Type

Manufacturer's type

designation

w Manufacturer's name and add.

1. Main Structure

(1) Dimension

	Dimension					
Overall length	Overall width	Overall height	Welght		Remarks	

(2) Engine Mounted on the Tractor

	Remarks	Designated type
	Starting system	
	Cooling system	
	Stroke	
	Kind of fuel	
t d	rated revolu- tions	rpm
	horse. power	Ps

(4) Type of Clutch

(3) Power Transmission System  the crank- From the first From the first to the first shaft to the shaft to tilling the shaft to tilling the shaft to the shaft to the shaft to the shaft the tilling the shaft

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[	Main clutch		
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(5) Number of Change-Gear Positions

Main transmission	smission	Auxiliary	Belt	To	Tota1	Tillage
Forward	Reverse	trans- mission	speed- change	Forward	Reverse	transmission
Posi-	Posi-	Posi-	Posi-	Posi-	Posi-	Posi-
tions	ţ	tions	tions	tions	tions	tions

(6) Lubricant

Main tran	nsmission part	Tillage tr	Tillage transmission part
Kind	Regular amount	Kind	Regular amount
	0	And the state of t	0

		· · ·		
	~ <del>_</del> _	<u>s</u>		
*	ion	No. of wheels		
	im	w	·	
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	th in	0		
	(at (of	Z		
* .	el			-
	Rear wheel (at the time ) (of inspection)	Туре		
	<u> </u>	Ty		
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	H.	At the time of inspection		
	Width of tillage	7 0	<u> </u>	-
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7) Tillage par	уре	4 4 4 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
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(2)				
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(8) Other attachments

2. Surimary of Inspection Record

Surimary of Inspection Record
(1) Rotary Tilling Performance Test. (See the attached sheet for the place of

than 14 Cm in plowing depth and the working time converted into 10 ares has been within 120 minutes (Inspection Standard). testing plot and soil property.)
The result of test made under the following conditions has been marked deeper

	Depth of top soil			Cm
itions	between	stubs	rows x hill	Cm
Field conditions	Weeds growth			
	Degree of soft-	ness or hardness		
	Date of test			

ear)	Change-gear position	ltion	Rotary ti	Rotary tilling tine
Main	Auxiliary	Belt	F	No. of
trans- mission	rrans- inission	speed-change	7 ype	tines

Time re- quired for turning	w
Travel- ling speed	s/ш
Average width of tillage	Cm
Method of tillage	
1	ਮ 90
Additional Gross weight weight	kg
Range of tread or track	CB
Size of wheel and type	

	for	w		oing	ſ			
	Time re- quired for turning			ions ruu		Remarks		
· ;	Travel- ling speed	s/w	<b>;</b>	the continu		떠		
	Average width of tillage	Cm		carrying out		Rotary shaft r.p.m.	rpm	
	Method of tillage		e "	lities after o		Engine R	rpm	
	Gross	gg	Test on the Bench	/ abnorma	-		န ပြ	
	Additional weight	kg	ing Test on	showa any 5 hours.		oreak load of wheel axle		
	Range of A tread or w	Cm	(2) Continuous Running Test on the Bench	the wheel axle has not shown any abnormalities after carrying out the continuous running test on the bench for 5 hours.		Speed change positions		
	Size of wheel and type		(2) Con	the whee test on t		Item	Conditions of test	

(3) Reference records to the Handling. (Showing the conditions at the time of inspection.)

	Others		
t the time of	•	method for headland	
(Showing the conditions at the time of	Adjusting method and	range of tread	
howing the	Fitting	of wheel	
records to the Handing. (S)	Shape and	of handle	
ords to the	Kind of speed-	change lever	
(3) Reference rec inspection.)	Position of clutch lever	Steering clutch	
(3) K	Posit clute	Main clutch	

3. Additional Remarks

## Form 4. DUAL-PURPOSE TYPE

### INSPECTION RECORD SHEET

Date:

THE INSTITUTE OF AGRICULTURAL MACHINERY

Certificate No.

Agricultural Tractor (Walking Type) Dual-Purpose Type Kind of agricultural

designation Manufacturer's type

machinery

Manufacturer's name and add.

1. Main Structure

(1) Dimension

	Remarks	Weight: (inclusive of appx. 80% of fuel, regular amounts of lubricating oil and cooling water.
	Weight	<b>3</b>
	Overall height	É
Dimension	Overall width	B
	Overall length	Cm

(2). Engine Mounted on the Tractor

Rated horse- power	Rated revelu- tion	Kind of fuel	Stroke	Cooling	Starting	Remarks
ក្ ន	mdı					Designated type at the time of inspection

(3) Power Transmission System

(4) Type of Clutch

	1
Main clutch	
From the first shaft to tilling shaft	
From the crafk- From the first From the first shaft to the first shaft to the wheel shaft to tilling shaft	
From the crafk- shaft to the first shaft	

(5) Number of Change-Gear Positions

Main tran	ransmission	Auxiliary		Tota1	.a.]	Tillage
Forward	Reverse	Lrans- mission	speed- change	Forward	Reverse	transmission
Posi-	Posi-	Posi-	Posi-	Posi-	Posi-	Posi-
tions	tions	tions	tions	tions	tions	tions

(6) Lubricant

		·			· · · · ·		
Tillage	transmission	Posi-		1 part	Regular amount	9	
<b>1</b>	Reverse	Posi- tions		Tillage transmission part	Regul		
ਰੇ ਹੈ ਹੈ	Forward	Posi- tions		Tillage	Kind		
ane ed -	change	Posi- tions			nt	8	
Trans.	mission	Posi- tions		nsmission part	Regular amount		
	Reverse	Posi- tions	ricant	Main transmis	R		
	Forward	Positions	(6) Lubricant	Mī	Kind		
			- 42				

<u> </u>	<u> 11 H</u>	
time of) tion )	No. of wheels	
at the inspec	No.	
Rear wheel (at the time of) (inspection )	Туре	
Width of tillage	At the time of inspection	w <sub>O</sub>
Width	Max.	Ст
Tillage shaft	driving system	
	Type	

		Width of tillage	llage	Rear wheel (at the time of)	the time of)
Tillage	ige shaft				spection )
Type driving	system	Max. At i	At the time of inspection	Type	No. of wheels
		E O	E S		
(8) Equipments an	and Weight according to the Field Work	ding to the F	ield Work		
Work Test	Type of attachment	Additional weight	Whee1	Gross	Remarks
Plowing 2-(1) Field work		kв		kg	
Farrowing (after plowing)					
Power tilling 2-(1) Field work					
Transporting	Trailor kg (carrying 350)				

(9) Other attachments
2. Summary of Inspection Record
(1) Field Work Performance Test. (See the attached sheet for the place of testing plot and soil property.)
(a) Plowing

The result of test made under the following conditions has been marked deeper than 14 Cm in plowing depth and the working time converted into 10 ares has been within 120 minutes (Inspection Standard).

	Depth of top soil				
nditions	Space between stubs rows x hills		Type of	wheel and its size	
Field conditions	Weeds growth	<b>B</b>		Belt speed-change	
	Degree of soft- ness or hardness	<b>B</b>	Changing-gear positions	Auxiliary transmission	
3	of		210	Main transmittion	

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	Type of	wheel and its size	
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		Belt speed-change	19 Table 1
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	ยั	Auxiliary transmission	Section 1
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	56	Auxiliary transmis	-
Section 1	ਕੌਂ		
	렸	3 3 5 6	
	Changing-gear positions	1.3	
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Year.		1 12	
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Travel- Time re-	quired for
	speed
Method Average	tillage
Method	plowing tillage
Type of	plow
Gross	weight
al weight	Wheel
Additiona	Front
Range of	track

# (b) Rotary Tilling

than 12 Cm in tillage depth and the working time converted into 10 ares has been The result of test made under the following conditions has been marked deeper within 120 minutes (Inspection Standard).

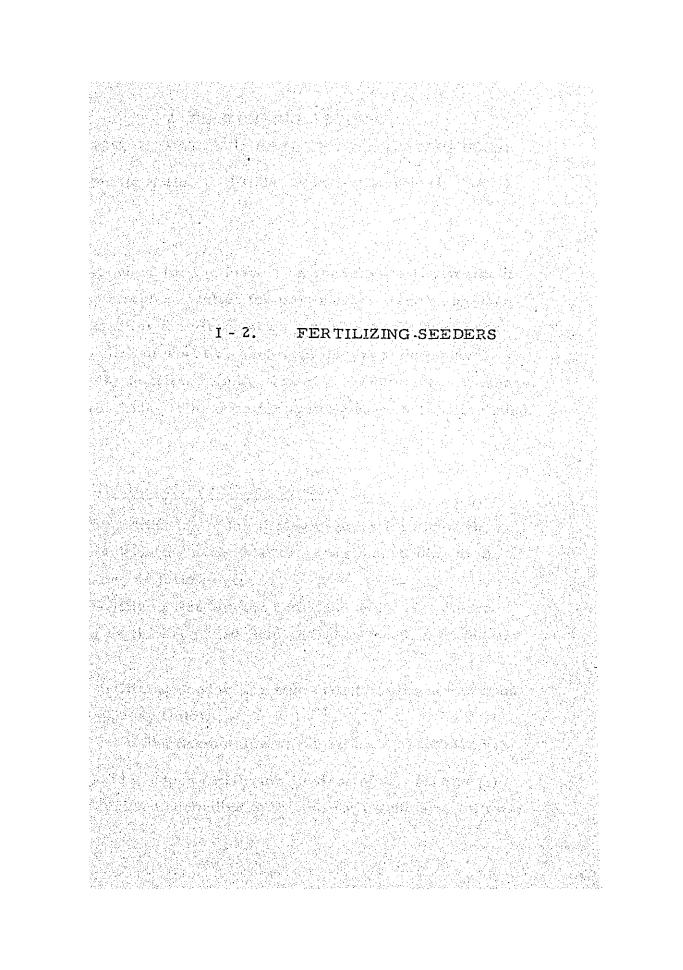
		field conditions	ditions		Chang	Change-gear positions Rotary tilling tine	sitions	Rotary ti.	ling tine
Date	Degree of	Weed	Space	Depth of	Main	Weed Space Depth of Main Auxiliary Belt	Belt	Type	Type No. of
Jo	softness	growth	between	between top soil trans-	trans-	trans-	speed-		tines
test	or hard-		stubs		mission	mission mission	change		
	ness		rows x						
			hills						
			CH	CB					

l- Time re- quired for turning	m/s		cation uous		
Travel- ling speed			ad appli e contin		
Average width of tillage	B		of break lo 7ing out th		
Method of plowing			is of 80% c		
Gross	kg	ench	condition malities a		
Range of Additional tread or weight	F.B.	st on the B	le under the	for 5 hours.	
	C.H.	Running T	of test mac s not show	the bench f	
Size of wheel and type		(2) Continuous Running Test on the Bench	The result of test made under the conditions of 80% of break load application to wheel axle has not shown any a normalities after carrying out the continuous	running test on the beach	
				17	

<del></del>		<del></del>	<del>,</del>	<b>-</b> 1	
<u>.</u>	кетагк				Others
r.p.m.	loaded shaft	rpm	rpm	e time of	Taking-off and fitting method of rotary til- ling part
Engine	r.p.m.	rpm	rpm	ions at th	ting d and ing of
Ratio of loads on	wheel axles		1	(Showing the conditions at the time of	
		G S	ъ Д	(Showing	Fitting: method of wheel
Change-gear positions	ng Tillage part			ecords to the Handling.	Shape and adjustment of handle
	Running part			rds to the	Kind of speed- change lever,
H		3	m	Reco	និប
Applied place of	break load	Shee l axle	Rotary tilling shaft	(3) Reference Rinspection.)	Position of clutch lever ing Steering clutch
\$ .	• • • • • • • • • • • • • • • • • • • •	Con-	of test	(3)	Pos clut Main clutch
				48 -	

(3) Reference Records to the Handling. (Showing the conditions at the time of inspection.)

	Others		
Taking-off and fitting	method of rotary til-	ling part	
Adjusting Taking-off method and and fitting	adjustment method of adjusting method of of handle wheel range of rotary til-	tread	
Fitting	method of wheel		
Shape and Fitting	adjustment of handle		
Kind of	11.	lever	
Position of clutch lever	7 <u>6</u>	cinicn	
Posit clutel	Main	cintci	



### I - 2 FERTILIZING SEEDERS

(FOR RICE, WHEAT AND BARLEY CULTIVATING USES)

(Date of Public Notice in Official Gazette: March 11, 1965.)

### 1. Scope

This standard for the inspection specifies testing methods and procedures of inspection for power driven fertilizing seeders to be used for the direct-sowing of rice on the dry paddy field or seeding of wheat or barley on the dry field (upland) along with the fertilizer application of granular form. Furthermore, the machines to be used for seeding only shall be included herein.

### 2. Classification of Fertilizing Seeders

- 2.1 The classification of fertilizing seeders for rice, wheat and barley cultivating uses shall be grouped according to the purpose of use as followings:
  - (1) Fertilizing Seeder (for combined use rice direct sowing on the dry paddy field and wheat seeding on the dry field).
  - (2) Fertilizing Seeder (for rice direct sowing use only on the dry paddy field).
  - (3) Fertilizing Seeder (for wheat or barley seeding use).
- 2.2 The said grouped fertilizing seeders of (1), (2) and (3) shall be classified according to the type of machine as follows:

### (1) Power Tilling Type Seeder

The power tilling type seeder means the seeding shall be done along with power tillage (inclusive of rotary tillage).

### (2) Pull Type Seeder

The pull type seeder means the seeder has a ground contacting parts tracted, (such as planting opener, soil covering plate, pressure wheel and ground contacting wheel, etc.), and the seeding shall be done on the soil-prepared field.

### (3) Multi-Hills Planting Type Seeder

The multi-hills planting type seeder means the sowing of seeds shall be made by dropping the seed-grains into the hole made on the surface of ground by a seeder.

### 3. Definition of Terms

The meaning of terms to be used in this standard shall be defined as follows:

### (1) Feed-Roll Shaft Revolutions

The feed-roll shaft revolutions shall mean the number of revolutions per minute or the number of reciprocations per minute of the feeding part.

### (2) Specified Revolutions

The specified revolutions shall mean the number of revolutions for the feed-roll main shaft which is indicated on the specification.

### (3) Operating-Equipment Weight

The operating-equipment weight shall mean the full-equipped weight including a tractor at work. In this case,

however, the weight shall be with 80% of fuel tank capacity, regular amounts of lublicating oil and cooling water, and approx. 80% of each hopper's capacity for fertilizers and seed-grains.

### 4. Procedures of Inspection

### 4.1 Items to be Inspected

The inspection shall be made by the following tests and investigations:

- (1) Verification of the Specification
- (2) Test of Field Work Performance
- (3) Handling Test
- (4) Feed-Roll Performance Test
- (5) Continuous Running Test in the Laboratory
- (6) Investigation after Disassembling

### 4.2 General Conditions for Inspection

### (1) Tractor to be Fitted with Equipments

The fertilizing seeder to be put on the test (hereinafter referred to as the "Fertilizing seeder on test") shall be mounted on the tractor, but this tractor shall not be permitted to exchange throughout the test.

(2) Preliminary Running of the "Fertilizing Seeder on Test"

The Fertilizing seeder on test shall be considered to have been run-in enough prior to the test. The preliminary running for each test shall be within 60 minutes.

### (3) Materials to be Used in Test

### 1) Seed-Grains

Rice and wheat seeds to be used for this test shall conform to the following requirements and pre-treat-ments before seeding:

### (a) Seed-grains of paddy rice

Seed-grains of paddy rice to be used for the tests shall be selected the medium sized and uniformed grains and the "Petit brachis" should be removed from the grains as many as possible.

Then, the following pre-treatments shall be required prior to the test of seeding.

- i) Salt-water selection
- ii) Disinfection by mercury compounds
- iii) Coating the seed-grains with organic chloric chemicals

Remarks: Seed-soaking shall not be practiced for giving the required moisture to seed-grains in order to promote the germinations in the above pre-treatment.

### (b) Fertilizer

The fertilizers to be used in the test shall be highly compound fertilizer of granular or pellet form and ordinary compound fertilizer as follows:

i) Highly compound fertilizer: The percentage of the main element contained shall be 10-20-20, and the size of granular particle or pellet shall be from 1.19 to 4.76 mm (or

- 4 16 mesh).
- ii) Ordinary compound fertilizer: The percentage of the main element contained shall be 8-8-5, and the size of granular particle or pellet shall be from 1.19 to 4.76 mm (or 4-16 mesh).

### (4) Measuring Instruments

Main instruments to be used for the measuring shall have been checked and calibrated prior to the measurements, and shall be capable of reading down to 1% of the maximum measuring value.

### (5) Suspension of Test

When one of each test stops longer than 30 minutes, the test shall be stopped. However, the test which may be stopped irrespective of manufacturer's responsibility shall be recovered.

### 4.3 Methods of Test and Investigation

### 4.3.1 Verification of Structure

### (1) Object

The object of this investigation is to ascertain the main dimensions, weights, materials, equipments and so forth in comparison actual things of the Fertilizing Seeder on test with the said items indicated on the specification.

### (2) Items to be Investigated

1) The following items for the tractor to be fitted with equipments shall be checked:

### Type of Tractor

Type of Mounted Engine on the Tractor

2) The size of body shall be checked in accordance with each seeding method:

Dimension

Overall length

Overall width

Overall height

Weight of Operating-Equipment

### 3) Power Transmission System

The power transmission system shall be checked from the P.T.O. shaft to the Feed-roll main shaft.

### 4) Feeding Parts

### (a) Seeds feeding part

The following points of the seed feeding part shall be checked:

Feeding mechanism

Adjusting mechanism for feeding volume

Number of adjusting positions

Number of hoppers

Capacity of each hopper

Number of feeding outlets

Other necessary items

### (b) Fertilizer feeding part

The following items of the fertilizer feeding part shall be checked.

Feeding mechanism
Adjusting mechanism for feeding volume
Number of adjusting positions
Number of hoppers

Capacity of each hopper
Number of feeding outlets
Materials used for the outlet
Other necessary items

### 5) Ground Contacting Parts

(a) In case of the multi-rows drill seeding, the following points of the ground contacting parts shall be investigated.

Maximum available number of rows

Adjustable range of inter-row space

Number of tilling times or craws and type,
(only for the Power tilling type seeder)

Covering device

Number of pressure rollers and size
With or without a planting device
Relative position between fertilizer and
grain

Other necessary items

(b) In case of the deep-placement seeding, the following points of the ground contacting parts shall be investigated.

Adjustable range of seeding width

Number of tines and its type

Size of pressure roller

Other necessary items

(c) In case of the multi-hills planting, the following points of the ground contacting parts shall be investigated. System of hole making

Number of rows

Adjustable range of inter-row space

Shape of hole making wheel

Other necessary items

### 4.3.2 Field Work Performance Test

### (1) Object

The object of this test is to ascertain the field work performance of the Fertilizing seeder on test which is mounted on the tractor.

### (2) Classified Testing Items

The classified testing items for the field work performance shall be grouped in accordance with the classification of types and purposes of use as shown in Table 1.

Classified Seeding Types and Purposes		Classified Testing Items	
	Power-Tilling Type Seeder	Multi-rows drill seeding test for rice, as stipulated in (3)-(3)-1.	
	termination and which is a Gregorian and another se	Deep-placement seeding	
For combined		test for wheat as stipulated	
use of rice-		in (3)-(3). However, this	
direct sowing		test shall not be made for	
on the dry pad-		the seeder which has not	
dy field and		equipped with the device of	
wheat seeding		deep placement seeding.	
on the dry			
field			

	Pull-Type Seeder	Multi-rows drill seeding test for rice, as stipulated in (3)-(3)-1.
	Multi-Hills Planting Type Sceder	Multi-hills planting test for rice, as stipulated in (3)-(3)-4.
For rice-	Power-Tilling Type Seeder	Multi-rows drill seeding test for rice, as stipulated in (3)-(3)-1.
direct sowing use only on the dry paddy field	Pull-Type Seeder	Multi-rows drill seeding test for rice, as stipulated in (3)-(3)-1.
	Multi-Hills Planting Type Seeder	Multi-hills planting test for rice, as stipulated in (3)-(3)-4.
	Power-Tilling Type Seeder	Multi-rows drill seeding test for wheat, as stipulated in (3)-(3)-1.
For wheat seeding use on the dry field		Deep-placement seeding test for wheat, as stipulated in (3)-(3). However, this test shall not be made for the seeder which has not equipped with the device of deep-placement seeding.
	Pull-Type Seeder	Multi-rows drill seeding test for wheat, as stipulated in (3)-(3)-2.

Classified Seeding Types and Purposes	Classified Testing Items	
	Multi-hills planting test for wheat, as stipulated in (3)-(3)-5.	

### (3) Methods of Testing for the Classified Testing Items

### (3)-1 Multi-Rows Seeding Test for Rice

### 1) Materials to be Used in Test

Seed-grains of paddy rice and highly compound fertilizer shall be used in this test, and the requirements for materials shall conform to 4.3-(3).

### 2) Testing Method

(a) The soil prepared paddy field shall be used for this test.

### (b) Number of passages

More than 4 passages shall be carried out, but the headland shall be omitted herefrom.

### (c) Rate of seeding

The rate of seeding shall, as a standard, be 150 grains per 1 m.

### (d) Amount of fertilizer application

The amount of fertilizer to be applied in this test shall be within the range of quantity from 30 to 50 kg per 10 ares.

### (e) Inter-row space

The inter-row space within a passage shall be from 20 to 30 Cm, and 20 - 40 Cm of the

inter-row space shall be kept between the adjoining passages. The number of rows shall be made up to the maximum available number of rows.

### (f) Depth of seeding

The depth of seeding shall, as a standard, be 2 - 3 Cm.

(g) The investigation shall be made for the depth of sown seeds and unevenness of sprouting at the time of the 2nd or 3rd leaves stage.

### 3) Items to be Measured and Investigated

### (a) Items to be Measured

- i) Travelling speed
- ii) Time required for turning
- iii) Space between rows
- iv) Depth of tillage (exclusive of the Pulltype seeder)
- v) Working width
- vi) Other necessary items

### (b) Items to be Investigated

- i) Feeding condition
- ii) Soil movement, pulverization (exclusive of the Pull type seeder) and state of soil covering
- iii) States of soil-pressuring and leveling
- iv) Unevenness of sowing
- v) Missing parts of hills and no germinations
- vi) Germinations taken in outside of the fixed range of field work

- vii) Relative position between the sown-seed and applied fertilizer
- viii) Other necessary items

### 4) Calculation

In converting of working hours into 10 ares, the following formula shall be applied.

In the case when the seeder is equipped with both the fertilizing device and the seeds-feeding device;

$$T_{1} = \left\{ \left( \frac{A}{V} + t_{1} \right) \frac{B}{b} + \left( \frac{F}{0.8Q_{1}} - 1 \right) t_{2} + \frac{S}{0.8Q_{2}} - 1 \right) t_{3} \right\} / 60$$

..... "a" formula

In the case when the seeder is equipped only with the seeds-feeding device;

$$T_2 = \left\{ \left( \frac{A}{V} + t_1 \right) \frac{B}{b} + \frac{S}{0.8Q_2} - 1 \right\} t_3 \right\} /60$$

.... "b" formula

where, T<sub>1</sub>T<sub>2</sub>: working time converted into 10 ares (min)

A: length of long side of the testing plot = 55 (m)

B: length of short side of the testing plot = 18.2 (m)

V : travelling speed = measured value (m/sec)

t<sub>1</sub>: time required for turning = measured value (sec)

F: amount of fertilizer application per 10 ares = 50 (kg)

Q<sub>1</sub>: capacity of fertilizer's hopper = measured value (kg)

S: seeding amoung per 10 ares =  $150 \times r$  (weight of 1,000 grains in g) /1,000 (kg)

Q<sub>2</sub>: capacity of seed-hopper = measured value (kg)

t<sub>2</sub>: time required for supplying fortilizer = 20 (sec)

t<sub>3</sub> : time required for supplying seeds = 20 (sec)

### (3)-2 Multi-Rows Drill Seeding Test for Wheat

### 1) Materials to be Used in Test

Seed-grains of wheat and ordinary compound fertilizer shall be used as stipulated in 4.2-(3).

### 2) Testing Method

(a) The plot to be used for testing of the Power tilling type seeder shall be chosen the paddy field where the soil preparation has not been made after harvesting crops, and the soil prepared paddy field after cropping shall be used for the Pull type seeder.

### (b) Number of passages

More than 4 passages shall be carried out, but the headland shall be omitted herefrom.

### (c) Rate of seeding

The rate of seeding shall, as a standard, be  $250 \text{ grains per } 1 \text{ m}^2$ .

### (d) Amount of fertilizer application

The amount of fertilizer to be applied in this test shall be within the range of quantity from 30 to 50 kg per 10 ares.

### (e) Inter-row space

The inter-row space within a passage shall be 20 Cm, and 25 Cm of the inter-row space shall be kept between the adjoining passages.

### (f) Depth of seeding

The depth of seeding shall, as a standard, be 3 Cm.

### (g) Number of rows

The number of rows shall be made up to the maximum available number of rows.

(h) The investigation shall be made for the depth of sown seeds and unevenness of sprouting at the time of the 2nd or 3rd leaves stage.

# 3) Items to be Measured and Investigated

### (a) Items to be measured

- i) Travelling speed
- ii) Time required for turning
- iii) Space between rows
- iv) Depth of tillage (exclusive of the Pull type seeder)
- v) Working depth

### vi) Other necessary items

### (b) Items to be Investigated

- i) Feeding condition
- ii) Soil movement, pulverization (exclusive of the Pull type seeder) and state of soil covering
- iii) States of soil-pressuring and leveling
- iv) Unevenness of sowing
- v) Missing parts of hills and no germinations
- vi) Germinations taken in outside of the fixed range of field work
- vii) Relative position between the sown seed and applied fertilizer
- viii) Other necessary items

### 4) Calculation

The conversion of working hours into 10 ares shall be calculated by "a" or "b" formular in the preceding paragraph of the calculation method of (3)-1.

where, F: amount of fertilizer application per 10 ares = 75 (kg)

> S: seeding amount per 10 ares (kg) = 250 x  $\gamma$  (weight of 1,000 grains in g)/1,000

### (3)-3 Deep-Placement Seeding for Wheat

### 1) Materials to be Used in Test

Seed-grains of wheat and ordinary compound fertilizer shall be used in this test, and the requirements for materials shall conform to 4.2-(3).

### 2) Testing Method

(a) The plot to be used for this test shall be chosen the paddy field where the soil preparation has not been made after harvesting crops.

### (b) Number of Passages

More than 4 passages shall be carried out, but the headland shall be omitted.

### (c) Rate of Seeding

The rate of seeding shall, as a standard, be 250 grains per 1 m<sup>2</sup>.

1. 1. C. M.

### (d) Amount of Fertilizer Application

The amount of fertilizer to be applied in this test shall be within the range of quantity from 30 to 50 kg per 10 ares.

### (e) Width of Seeding

The width of seeding shall be within the range from 30 to 40 Cm.

### (f) Depth of Seeding

The depth of seeding shall, as a standard, be from 5 to 6 Cm.

### (g) Inter-Ridge Space

- .) . The space between ridges shall, in principle, be the same with the width of seeding.
- (h) The investigation shall be made for the depth of sown seeds and unevenness of sprouting at the time of the 2nd or 3rd leaves stages.

### 3) Items to be Measured and Investigated

- (a) Items to be measured
  - i) Travelling speed
  - ii) Time required for turning
    - iii) Width of seeding
    - iv) Depth of tillage
    - v) Working width
    - vi) Other necessary items

### (b) Items to be investigated

- i) Feeding condition
  - ii) Soil movement, pulverizing and state of soil covering
  - iii) States of soil-pressuring and leveling
  - iv) Unevenness of seeding
  - v) Missing parts of hills and no germinations
  - vi) Germinations taken outside of the fixed range of field work
  - vii) Other necessary items

### 4) Calculation

The conversion of working hours into 10 ares shall be calculated by "a" or "b" formular in (3)-1.

where, F: amount of fertilizer application per 10 ares = 75 (kg)

S: seeding amount per 10 ares =  $250 \times \gamma$  (weight of 1,000 grains in g)/1,000

### (3)-4 Multi-Hills Planting Test for Rice

### 1) Materials to be Used in Test

Seed-grains of paddy rice shall be used in this test,

and the requirements for seed-grains shall conform to 4.2-(3).

### 2) Testing Method

(a) The soil prepared paddy field shall be used for this test.

### (b) Number of passages

More than 4 passages shall be carried out, but the headland shall be omitted.

### (c) Rate of seeding

The rate of seeding shall, as a standard, be 7 grains of rice per hole.

### (d) Number of rows

The number of rows shall be made up to the maximum available number of rows.

(e) The investigation shall be made for the depth of sown seeds and unevenness of sprouting at the time of the 2nd or 3rd leaves stage.

# 3) Items to be Measured and Investigated

### (a) Items to be measured

- i) Travelling speed
- ii) Time required for turning
- iii) Working width
- iv) Space between rows
- v) Space between hills
- vi) Number of seed-grains dropped into the hole or dropped on outside of the hole
- vii) Method of soil covering and time required for covering

### viii) Other necessary items

### (b) Items to be investigated

- i) Feeding condition
- ii) Field work condition
- iii) Missing parts of hills
- iv) Other necessary items

### 4) Calculation

The conversion of working hours into 10 ares shall be calculated by "b" formula in (3)-1.

### (3)-5 Multi-Hills Planting for Wheat

### 1) Materials to be Used in Test

Seed-grains of wheat shall be used in this test, and the requirements for seed-grains shall conform to 4.2-(3).

### 2) Testing Method

(a) The plot to be used for this test shall be chosen the paddy field where the soil preparation has not been made after harvesting crops.

### (b) Number of passages

More than 4 passages shall be carried out, but the headland shall be omitted.

### (c) Rate of seeding

The rate of seeding shall, as a standard, be 7 or 8 grains of wheat per hole.

### (d) Number of rows

The number of rows shall be made up to the maximum available number of rows.

(e) The investigation shall be made for the depth of sown seeds and unevenness of sprouting at the time of the 2nd or 3rd leaves stage.

### 3) Items to be Measured and Investigated

### (a) Items to be measured

- i) Travelling speed
- ii) Time required for turning
- iii) Working width
- iv) Space between rows
- v) Space between hills
- vi) Number of seed-grains dropped into the hole or dropped on outside of the hole
- vii) Method of soil covering and time required for covering
- viii) Other necessary items

### (b) Items to be Investigated

- i) Feeding condition
- ii) Field work condition
- iii) Missing parts of hills
- iv) Other necessary items

### 4) Calculation

The conversion of working hours into 10 ares shall be calculated by "b" formula in (3)-1.

where, S: seeding amount per 10 ares (kg) =  $25 \times \gamma$  (weight of 1,000 grains in g)/1,000

### 4.3.3 Handling Test

### (1) Object

This test is made for the purpose of ascertaining case or otherwise of handling the Fertilizing seeder on test which is fitted to the tractor and also its fitting easiness.

# (2) Field Work to be Tested in Handling Test

The field work to be tested in the handling test shall be made for the same work as carried out in the field work performance test.

### (3) Testing Method

The investigation shall be done by more than two investigators operating the Fertilizing seeder on test with seed-grains and fertilizers feeding practice in the similar field condition where the field work performance test has been made.

### (4) Items to be Investigated

- Easiness of handling and stability when the tractor is travelling and turning
- 2) Easiness of handling the levers
- 3) Safety
- 4) Easiness of fitting to the tractor and taking-off.
- 5) Easiness of replacing and adjusting the parts
- 6) Easiness of supplying or taking out the materials and confirming the amount remained
- 7) Other necessary items

### 4.3.4 Feeding Part Performance Test

### (1) Opening Degree Test

### 1) Object

This test is carried out for the purpose of ascertaining the unevenness of feeding amounts among the feeding outlets and the range of feeding for seedgrains and fertilizers.

### 2) Materials to be Used in Test

Seed-grains and fertilizers to be used in this test shall be the same as stipulated in 4.2-(3), and the division of material use in accordance with the type of the Fertilizing seeder on test shall conform to the way of dividing as shown in Table 2.

Table 2.

Purpose of use Materials	For combined use of rice direct-sowing on the dry paddy field and wheat seeding on the dry field	For rice direct sow- ing use on the dry pad- dy field	For wheat se- eding use on the dry field
Seed-grains	Seed-grains of rice and wheat	Seed-grains of rice	Seed-grains of wheat
Fertilizers	Highly compound fertilizer and or- dinary compound fertilizer	Highly com- pound ferti- lizer	Ordinary compound fertilizer

### 3) Testing Equipment

In the case that the power is transmitted from the tractor to the feeding part, the seeder shall be driven

by the engine mounted on the tractor after fixing it on the bench. However, for those which get the driving power through the ground contacting wheel or the hole digging wheel, the Fertilizing seeder on test shall be driven by a motor through the reduction-gear.

### 4) Testing Method

- (a) Materials stipulated in preceding paragraph (1)-2) shall be used in this test and the test shall be carried out for the respective division.
- (b) Number of feed-roll shaft revolutions

  The rotating speed of a feed-roll shaft shall be run at the specified revolutions.

### (c) Number of feeding outlets

(The number of feeding outlets correspond to the number of fertilizing and seeding rows.)

The number of rows shall be made up to the maximum number of rows.

(d) Filling amounts for seed-grains and fertilizers

About 80% of capacity of each hopper shall be filled with fertilizers or seeds.

### (e) Opening-degree test

The test for opening degree shall be made for 5 different opening degrees on the feeding shutter (approx. 1/4, 2/4, 3/4 and 4/4) including the one at the minimum available opening degree for feeding.

### 5) Items to be Measured and Investigated

- (a) The measurement of feeding amount at each opening degree shall be made for the individual outlet, taking the measurement for 30 seconds on each degree.
- (b) Feeding condition
- (c) Other necessary items

### 6) Calculation

The feeding amount of each outlet per 1 m of travelling distance shall be calculated by the following formula:

gm = 
$$\frac{gh}{30V}$$
 ..... "c" formula where.

gm: feeding amount of one outlet per 1 m (g/m)

gh: average feeding amount of each outlet for 30 sec. (g)

V: travelling speed (m/sec) (The travelling speed shall be computed by the number of revolutions and effective diameter of wheel.)

(b) The feeding amount of fertilizer to convert into 10 ares shall be made by the following formula:

$$Gf = \frac{Gm \times Nf}{b}$$
 ...... "d" formula where,

Gf: applied amount of fertilizer per 10 ares (kg/10a)

Gm: average feeding amount of feeding outlets per 1 m (fertilizer) (g/m)

Nf: number of fertilizer feeding outlets

b : working width per passage (m)

- (c) In converting of the number of sown seeds per 1 m and per hole shall be computed by the following formulae:
  - i) Number of sown seeds converted into 1 m (in case of the Power-tilling type and the Pull type uses).

$$Gs = \frac{Gm \times Ns \times 1,000}{b \times}$$
 "e" formulae

where,

Gs: number of sown seeds per 1 m<sup>2</sup> (grains/m<sup>2</sup>)

Gm: average feeding amount of feeding outlet per 1 m (seed-grains) (g/m)

Ns: number of seed-feeding outlets

b: working width per passage (m)

: weight of 1,000 grains (g)

ii) Number of sown seeds converted into one hole (in case of the Multi-hills planting type use).

where,

Ga: number of sown seeds per hole (seeds/hole)

gh: average feeding amount per outlet for 30 seconds (g)

: weight of 1,000 grains (g)

Z : number of projecting teeth the hole digging wheel

H: number of revolutions per minute for the hole digging wheel (rpm)

iii) Unevenness of feeding amount among the feeding outlets shall be computed by the following formula:

 $Gp = \frac{(gm - Gm)}{Gm} \times 100 \dots$  "g" formula

where,

Gp: unevenness of feeding amount among the feeding outlets (%)

gm: maximum or minimum feeding amount of one outlet per l m (g/m)

Gm: average feeding amount of outlets per 1 m (seed-grains and fertilizers). However, as to the unevenness of feeding amount, the numerical value shall be of feeding amount at opening degree which may be within the range of feeding amount as shown in Table 3.

Table 3.

Materia	Purpose of use	Power-Tilling Type Seeder and Pull Type Seeder	Multi-Hills Plant- ing Type Seeder		
Seed-	Seed-grains of paddy rice	120 - 320 (grains/m²)	5 - 14 (grains/hole)		
grains	Seed-grains of wheat	200 - 350 (grains/m <sup>2</sup> )	7 - 12 (grains/hole)		
Ferti-	Highly compound	30 - 100 (kg/10 a)			
lizers	Ordinary compound	40 - 100	0 (kg/10 a)		

### (2) Test for Feed-Roll Shaft Revolutions Changing

1) This test is made for the purpose of ascertaining the feeding amount per unit distance in case when the shaft speed of the Fertilizing seeder on test is changed due to the change of travelling speed.

### 2) Materials to be Used in Test

Seed-grains and fertilizers stipulated in 4.2-(3) shall be used in this test, and the division of material use according to the type of the Fertilizing seeder on test shall conform to the way of dividing as shown in Table 4.

Table 4.

	<del></del>	<del>,</del>	
Purpose	For combined	For rice di-	For wheat
of use	use of rice di-	rect sowing	seeding use on
	rect sowing on	use on the	the dry paddy
	the dry paddy	dry paddy	field
	field and wheat	field	
$\mathbf{I}_{\mathbf{I}}$	seeding on the		
Materials	dry field		
Seed-grains	Seed-grains of paddy rice	Seed-grains of paddy rice	Seed-grains of wheat
			<u> </u>
Fertilizers	Highly compound fertilizer	Highly compound fertilizer	Ordinary compound fertilizer

### 3) Testing Equipment

The equipment to be used for this test shall conform to 4.3.2-(1).

### 4) Testing Method

- (a) Materials stipulated in preceding paragraph
- (2) shall be used in this test.

# (b) Number of feed-roll shaft revolutions

In this test, the feed-roll shaft shall be run at 15% higher than specified speed, and 15% lower than specified speed and including one at specified speed. However, if the engine speed per minute of the tractor exceeds the specified speed, in case of the feed-roll shaft is run at 15% higher than specified speed, the specified revolutions shall be applied.

### (c) Opening degree

The opening degree for the feed-shutter shall, as a standard, be kept to be able to obtain the following amounts of feeding for the respective division as shown in Table 5.

Table 5.

Materi	Purpose of use	Power-Tilling Type Seeder and Pull Type Seeder	Multi-Hills Plant- ing Type Seeder
Seed-	Seed-grains of paddy rice	approx. 150 (grains/m <sup>2</sup> )	approx. 7 (grains/hole)
grains	Seed-grains of wheat	approx. 250 (grains/m <sup>2</sup> )	approx. 7 (grains/hole)
Ferti-	Highly compound	approx. 5	0 (kg/10 a)
lizers	Ordinary compound	approx. 7	5 (kg/10 a)

Remarks: For the Power-Tilling Type Seeder,
this test shall be made for the field
work of multi-drill seeding.

### 5) Items to be Measured and Investigated

- (a) The measurement of feeding amount at each opening degree shall be made for the individual outlet, taking the measurement for 30 seconds and be repeated it for 3 times on each degree.
- (b) Feeding condition
- (c) Other necessary items

### 6) Calculation

- (a) The amount of feeding per 1 m shall be calculated by "c" formula.
  - (b) The percentage of feeding amount variance per unit distance shall be obtained from the following formula:

$$Gnp = \frac{(Gmp - Gms)}{Gms} \times 100 \dots$$
 "h" formula

where,

Gnp: variance percentage of feeding amount per unit distance (%)

Gmp: average feeding amount of outlets in case when the feed-roll shaft is run at (\frac{+}{15\%}) higher or lower than specified speed (g/m)

Gms: average feeding amount of outlets under the specified revolutions of feed-roll shaft (g/m)

### (3) Feeding Test under Travelling Condition

### l) Object

This test is made for the purpose of ascertain the feeding function of the Fertilizing seeder on test under the travelling condition.

# 2) Materials to be Used in Test

Seed-grains stipulated in 4.2-(3) shall be used, and the division of material use in accordance with the type of the Fertilizing seeder on test shall conform to the way of dividing as shown in Table 6.

Table 6.

Purpose of use	For combined use of rice direct sow-ing on the dry pad-	rect sowing	For wheat se- eding use on the dry field
Materials	dy field and wheat seeding on the dry field	paddy field	
Seed-grains	Seed-grains of paddy rice	Seed-grains of paddy rice	Seed-grains of wheat

### 3) Testing Method

The test shall be made by dropping seed-grains on the ground while travelling at the specified revolutions of feed-roll shaft in the (bear land) test plot, and with regard to the opening degree of the feed-shutter shall be the same as stipulated in (2)-4)-(c). For this test, materials stipulated in (3)-2) shall be used.

### 4) Items to be Investigated

- (a) Feeding condition
- (b) Number of sown seeds per 1 m
- (c) Other necessary items

### 4.3.5 Continuous Running Test in the Laboratory

This test shall be made after testing of the feeding part.

### (1) Object

The object of this test is to ascertain the operating condition, degree of damaged seed-grains, smashed fertilizer's particles and that there is no development of irregularities or troubles under the continuous running of the Fertilizing seeder on test.

### (2) Materials to be Used in Test and Quantity

Seed-grains and fertilizers to be used in this test shall conform to 4.2-(3). Seeding and fertilizing amounts per row shall be 1 kg of seed-grains and 10 kg of fertilizers.

Materials to be used for this test shall be divided into the following combined use in accordance with the using purpose of the Fertilizing seeder on test as shown in

Table 7.

Purpose of use Materials	For combined use of rice direct sowing on the dry paddy field and wheat seeding on the dry field	For rice di- rect sowing use on the dry paddy field	For wheat seeding use on the dry field
Seed-grains	Seed-grains of paddy rice	Seed-grains of paddy rice	Seed-grains of wheat
Fertilizers	Highly compound fertilizer	Highly compound fertilizer	Ordinary compound fertilizer

# (3) Testing Equipment

1) The equipment to be used for this test shall conform to 4.3.4-(1)-3).

# (4) Testing Method

1) Materials stipulated in preceding paragraph (2) shall be used in this test.

### 2) Number of Feed-Roll Shaft Revolutions

The rotating speed of feed-roll shaft shall be run at the specified number of revolutions.

### 3) Degree for Feed-Shutter Opening

In this test, the arrangement of opening degree for the feed shutter shall be the same as stipulated degree in 4.3.4-(3)-(a).

### 4) Running Hours

For this test, the Fertilizing seeder on test shall be run continuously for 3 hours through the arrangement of keeping the materials' circulation during the test.

### 5) Investigation for Damaged Seed-Grains

The specimens (feeding amount) shall be collected from each outlet, sampling the specimens for 30 seconds and be repeated it for 3 times on each outlet. And the dividing of collected specimens into the improper hulled, smashed, damaged seed-grains and so forth, shall be made by hands.

### 6) Investigation for Smashed Fertilizers

For the purpose of this investigation, about 10 kg of specimen shall be collected during the first feeding round of circulation and be separated by a siever of 0.84 mm in net-size which corresponds to 20 mesh.

### (5) Items to be Measured and Investigated

### 1) Items to be Measured

### (a) Percentage of damaged seed-grains

The weight of defective seed-grains among the specimens collected in (4)-5), such as improper hulled, crashed and damaged seed-grains, shall be measured and the percentage of defective grains weight to the specimen shall be the percentage of damaged seed-grains.

### (b) Percentage of smashed fertilizer

With regard to the specimens collected in (4)-5). The weight of fertilizer smashed down to less than 0.84 mm (20 mesh) shall be measured, and the percentage of smashed fertilizers' weight to the specimen shall be the percentage of smashed fertilizers.

### 2) Items to be Investigated

- (a) Feeding condition
- (b) Adherent state of materials to the parts
- (c) To ascertain that there is no development of irregularities or troubles

### 4.3.6 Investigation after Disassembling

This investigation shall, as a rule, be carried out immediately after the continuous running test in the laboratory.

### (1) Object

The main object of this test is to ascertain that there is no development of irregularities on the Fertilizing seeder on test after the continuous running test.

### (2) Items to be Investigated

The Fertilizing seeder on test shall be disassembled in order to make the investigation for the necessary measures taken against the dust, water and corrosion proof.

### 5. Standards to Pass the Inspection

The decision of inspection for Fertilizing Seeders (rice and wheat cultivating uses) shall be made by the followings:

### 5.1 Performance Inspection

- (1) The result of test in 4.3.2, the working hours converted into 10 ares for the Power-tilling type seeder and the Multi-hills planting type seeder shall be within
- ( min.) =  $\frac{60}{\text{working width per passage}}$ , and be within
- (min.) =  $\frac{36}{\text{working width per passage}}$  for the Pull type seeder.
- (2) The result of test in 4.3.2, there shall not be noticeable parts of hill missing and no-germination.
- (3) The result of test in 4.3.2, there shall not be noticeable germinations taken in the outside of fixed place.
- (4) In case of the test has been carried out with rice seed-grains, wheat seed-grains, highly compound fertilizer and ordinary compound fertilizer, the range of feeding for the test of 4.3.2 must satisfy the following requirements as shown in Tables 8, 9 and 10.
  - (a) The following range of feeding amounts shall be applied to the fertilizing seeder for combined use in

rice direct-sowing on the dry paddy field and wheat seeding on the dry field.

Table 8.

Type of seeder Materials	Power-Tilling Type Seeder and Pull Type Seeder	Multi-Hills Planting Type Seeder
Seed-grains of paddy rice	Infimum (greatest lower bound): 2 below 120 grains/m Supremum (least upper bound): over 320 grains/m <sup>2</sup>	Infimum: below 5 grains/hole Supremum: over 14 grains/hole
Seed-grains of wheat	Infimum: 2 below 200 grains/m <sup>2</sup> Supremum: 2 over 350 grains/m	Infimum: below 7 grains/hole Supremum: over 12 grains/hole
Highly compound fertilizer	Infimum: below 30 kg/10a Supremum: over 100 kg/10a	
Ordinary compound fertilizer	Infimum: below 40 kg/10a Supremum: over 100 kg/10a	

(b) For rice direct-sowing use on the dry paddy field.

Table 9.

Type of seeder Materials	Power-Tilling Type Seeder and Pull Type Seeder	Multi-Hills Planting Type Seeder
Seed-grains of Rice	Infimum: below 120 grains/m <sup>2</sup> Supremum: over 320 grains/m <sup>2</sup>	Infimum: below 5 grains/hole Supremum: over 14 grains/hole
Highly compound fertilizer	Infimum: below 30 kg/10 a Supremum: over 100 kg/10 a	

(c) For wheat seeding use on the dry field.

Table 10.

Type of Seeder Materials	Power-Tilling Type Seeder and Pull Type Seeder	Multi-Hills Planting Type Seeder
Seed-grains of Wheat	Infimum: below 200 grains/m <sup>2</sup> Supremum: over 350 grains/m <sup>2</sup>	Infimum: below 7 grains/hole Supremum: over 12 grains/hole
Ordinary compound fertilizer	Infimum: below 40 kg/10 a Supremum: over 100 kg/10 a	

Remarks:

The above numerical values for the range of feeding amounts are obtained through the consideration of various factors, such as difference in the rate of sowing method from place to place, varietal difference in grain-size and variance of grainsize when it is soaken in water for the pre-treatment before sowing.

(5) In the test of 4.3.4-(1), the unevenness of feeding amounts among the feeding outlets should be within the range of unevenness as shown in Table 11.

Table 11.

Type of Seeder	Power-Tilling Type Seeder and Pull Type Seeder	Multi-Hills Planting Type Seeder			
Seed-grains of Rice and wheat	± 15%	± 15%			
Highly compound fertilizer	± 10%				
Ordinary compound fertilizer	± 15%				

(6) When the test is carried out at different speed of feed-roll shaft instead of the specified revolutions, the feeding

amount per unit distance must not exceed ± 15% of the feeding amount under the specified revolutions.

(7) The percentage of damaged seed-grains in the test of 4.3.5, in case of rice seed-grains use must not exceed 2% and 0.5% for wheat seed-grains use.

### 5.2 Durability Inspection

- (1) The durability inspection shall be required to satisfy the requirements that there has no development of abnormalities and failures in principal parts and parts which may be difficult to replace easily.
- (2) The parts contacting with fertilizers and chemicals or the parts which may have the possibility of contacting with the said materials shall be of those having the necessary measures taken against corrosion.

### 5.3 Handling Inspection

- (1) Handling condition shall not show any defects than may bring much fatigues to the operator in the test of 4.3.3.
- (2) There shall be no defects that may bring much dangerous feeling to the operator in the test of 4.3.3.
- (3) No defects that shall be the cause of difficulties to carry out the field work smoothly due to uneasy fitting to the tractor and replacing or adjusting the parts in the test of 4.3.3.

# INSPECTION RECORD SHEET Date: THE INSTITUTE

Kind of agricultural machinery

Certificate No.

THE INSTITUTE OF AGRICULTURAL
MACHINERY

wal
Ertilizing Seeder (Combined use for rice direct-sowing on the
dry paddy field and wheat seeding on the dry field), (MultiHills Planting Type)

machinery

Hills Planting Type)

Manufacturer's type

designation

Manufacturer's name and add.

I. Type's name of the tractor used in this test for fitting the "Fertilizing Seeder on test"

to it.

2. Main Structure

Main Structure
(1) Dimension of Body and Weight

(The numerical value shown herein shall mean the measured value under the condition of being fitted the "Fertilizing Seeder on test" to the tractor.)

Remarks	kg Seeds, fertilizers (over 80% of each capacity), regular amount of lubricating oil and water shall be included in the gross weight.
Gross	<b>89</b> ,
Overall height	ww
Overall width	<b>ww</b>
Overall length	ww

(2) Position of Power Take-Off

Seed-feeding: Fertilizer-feeding:

Capacity of Number of feeding hopper outlets			Feeding Remarks roll	
Type of ad- justing mecha- degree and nism for feeding amount feeding amount			Feeding Feeding box roll-shaft	
Type of feeding mechanism			Hopper	というとは、法理等
Feeding	Seed-feeding part	Fertilizer feeding part	Main parts of feeding section	Materials

(The following records show the conditions of tilling tines, pressure-roller, (4) Structure of Ground Contacting Part and its Adjusting Range screaper and soil covering device at the time of inspection.)

Relative position be- tween seed and fertilizer		
Type of screaper		
Size of pressure roller (mm) and number of roller		
Kinds of tilling pressure roller tines and number of tines ber of roller		
No. of Adjusting rows rows row space	Gm	
No. of rows		

# 3. Summary of Inspection Records

(1) Field Work Performance Test (See Note (2) for the condition of testing plot and its location.)

followings. And the time required for the field work converted into 10 ares has been considered as proper working hours from the standpoints of structure and number of The results of the field work test and working condition have been recorded as seeding rows of the "Fertilizing Seeder on test".

With regard to the state of germination has been recognized as proper sprout looking through the records of germination survey.

		Seed-grains paddy rice a Condition highly com- of Field pound ferti-	- 94 -	Position of	change gear	Main Aux. Tilling	
Materials	used for the test	Seed-grains of paddy rice and highly com- pound ferti- lizer Note (4)	Seed-grains of wheat and ordinary com- pound ferti- lizer Note (4)	Z			
Seeding	method	Multi- rows seeding	Deep place- ment seeding	No. of feeding outlets	Speeds		
Date of	test			ng outlets	Fertilizer		
No. of rows and	width of seeding	rows	Cm		lizer		
Space	between rows			Opening de	Seeds		
Track	Type			Opening degree of feed shutter	Fe		
Track or tread	Range of track	<b>u</b> S	8	d shutter	Fertilizer		

Position of	No. of feed	No. of feeding outlets		Opening degre	Opening degree of feed shutter
change gear	Seeds	Fertilizer	H	Seeds	Fertilizer
Mein Aux. Tilling					
Main Aux. Tilling					

Remarks		
Relative position between seed and fertilizer		
Hours re- quired for 10 ares of field work	m <b>in</b> .	min.
Time re- quired for turning	S S S	Sec
Travelling	m/s	m/s
Working width of one passage,(1)	$C_{\mathbf{m}}$	Cm
Seeding	Multi-rows seeding	Deep placement seeding
scords	A gaitse?	L
		_ 2

Note (1) Working Width per Passage

Working width per passage for the deep placement seeding shall be inter-row spacing shall be Cm and Cm for a passage.

Testing Plot and its Location double that of seeding, and in case of the multi-rows seeding, the

double that of seeding, and in inter-row spacing shall be

Note(2) Testing Plot and its Location

The testing plot for the deep following conditioned field.

The testing plot for the deep placement seeding has been selected the following conditioned field. Height of stub:

CB

- State of foot stamping:
- The condition of testing plot for the multi-rows seeding has been 3. Space between the hills (Cm) x Space between the rows (Cm) recorded as follows:
- . State of pulverization:
- 2. Degree of leveling:
- . Degree of exposed stubs:
- 4. Degree of wet or dry condition of soil;
- (2) Feeding Section Performance Test
- .) Opening Degree Test

passage shall be ... Cm (20 Cm of space between the rows and 25 Cm of inter-row maximum and minimum feeding amount for each outlet under its opening degree of which show the feeding amount at different opening degrees converted into 10 ares spacing between the passages). The numerical value in the parenthesis shows the the feed-shutter. The value shown outside of the parenthesis is the mean value of seeding with seed-grains of wheat and ordinary compound fertilizer, the width of under the field work condition stated in (1). However, in case of the multi-rows The results of this test have been recorded as followings. The figures of

of the feed-shutter	Minimum 1/4 1/2 degree opening opening degree	st-	rows	<b>3.5</b>	rows	ment outlets
Number of feed-roll	Items (wmit)	Degree of opening adjust- ment	Multi-rows seeding: (kg/10 a)	Degree of opening adjust- ment	Multi-rows seeding: (kg/10 a)	Deep placement seeding: outle (kg/102)

- 1					
Degree of opening adjust- ment	Multi-rows seeding: rows (kg/10 a)	Degree of opening adjust- ment	Multi-rows seeding: rows (kg/10 a)	Deep placement seeding: outlets (kg/10 a)	
Highly	fertilizer Note ( <sup>4</sup> )		Ordinary compound fertilizer Note (4)		Remarks

2) Feed-Roll Shaft Speed-Change Test

The feeding amount has been changed in accordance with speed-change as

follows:

	Normal number of feed roll	Opening	Average am	Average amount of feeding (kg/10 a)	ng (kg/10 a)	
Marerials	shaft rev- olutions N (r.p.m.)	degree tested	at normal speed (3)	15% lower then N	15% higher than N	
Seed-grains of passy rice $(^{4})$						
Highly com- pouned fertilizer (4)						

number of revolutions as optimum speed by a manufacturer at the time The normal number of feed-roll shaft revolutions is the indicated of inspection. Note (3)

(3) Continuous Running Test on the Bench

The results of continuous running test on the bench for 3 hours made under the following conditions have not shown any noticeable abnormalities.

Materials	Method of material use and tested quantities	Opening degree of feed shutter and number of feed-roll shaft revolutions	Remarks
Seed-grains of paddy rice and highly com- pound fertilizer Note (4)	Seed-grains: 1 kg/1 seeding row Fertilizers: 10 kg/1 seeding row	At the same opening degree and r.p.m. of feed-roll shaft as stated in (2)-1.	

Note (4) The materials which having of those qualities mentioned hereunder have been used for this test.

Seed-grains of paddy rice	Harvesting year:
Weight of 1,000 grains:	(g) Grain-weight per litter: (kg)
Seed-grains of wheat	Harvesting year:
Weight of 1,000 grains:	(g) Grain-weight per litter: (kg)

Ratio of component (three elements): 10:20:20 - 4.8 mm (4 - 16 mesh) Highly compound fertilizer Weight per litter: Size of particle:

100

 $\infty$ Ordinary compound fertilizer Ratio of component: Size of particle: 1.2 - 4.8 mm (4 - 16 mesh)

Weight per litter:

(4) Reference Record to Handling (The following records show the conditions for the articles listed hereunder at the time of inspection.)

Taking-out method of the remained amount inside of hopper	
Confirming method of the remained amount inside of hopper	
Position of hopper	
Adjusting system of opening degree	
Position and type of clutch lever	"我,你我说,你说话,你
Balance weight at the time of field work test	

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and the control of th	antina ang kalamatan Makalamatan Santan Santan Santan Santan Santa			Fitting method to the tractor		4. Additional Remarks
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# INSPECTION RECORD SHEET

THE INSTITUTE OF AGRICULTURAL

Certificate No.

Kind of agricultural Fertilizing Seeder (Combined use for rice direct-sowing on the machinery Tilling Type).

Manufacturer's type designation

Manufacturer's name and add.

Manufacturer's name of the tractor used in this test for fitting the "Fertilizing Seeder on test".

2. Main Structure

(1) Dimension of Body and Weight

(The numerical value shown herein shall mean the measured value under the condition of being fitted the "Fertilizing Seeder on test" to the tractor.)

Remarks	Seeds, fertilizer (over 80% of each capacity), regular amount of lubricating oil and water shall be included in the gross weight.
Gross weight	kg
Overall height	audin in the second sec
Overall width	uu.
Overall length	

(2) Position of Power Take-Off

Seed-feeding:

Fertilizer-feeding:

(3) Structure of Feeding-Section and Materials Used

amount feeding amount feeding amount		Hopper Feeding Feeding Remarks roll	Materials used at the time of time of inspection
Feeding	Seed-feeding part Fertilizer feeding part	Main parts of feeding section	Materials used for fertilizer feeding part

records show the conditions of tilling fines, pressure-roller, screaper and soil (4) Structure of Ground Contacting Part and its Adjusting Range. (The following covering device at the time of inspection.)

	Relative position be- tween seed and fertilizer	
	Type of screaper	
	Size of pressure roller (mm) and num- ber of rollers	
하라 아이들은 작용한 눈이들은 맛이	Kinds of tilling pressure tines and num. (mm) and ber of tines ber of to	
	Adjusting range of inter- space	Ë
	No. of rows	

## 3. Summary of Inspection Records

(1) Field Performance Test (See Note (2) for the condition of testing plot and its location.)

followings. And the time required for the field work converted into 10 ares has been considered as proper working hours from the standpoints of structure and number of The results of the field work test and working condition have been recorded as seeding rows of the "Fertilizing Seeder on test".

With regard to the state of germination has been recognized as proper sprout looking through the records of germination survey.

	100		ija seran galiberikan k	gradian di kacamatan
Opening degree of feed-shutter	de lizer		Remarks	
Op de fe	Secde		posi ween wn	
Number of feeding outlets			Relative position between drop-down seed and fertilizer	
Number feeding outlets			1 - /	min
Position	change-gear	Main Aux. Tilling	Time required for the field work converted into	
Track or tread	of track	. au	Time required for turning	U W
ows between	Space the re		) []	m/s
ewor 1	o .oM	rows	Travelling speed	
1səj jo	Date		r L &	
Materials		Seeds-grains of paddy rice and highly com- pound ferti- lizer, Note(4)	Working width of one passage, Note (1)	Ğ
ld Work	of Fie	Condition	Records	gnitaeT

ote (1) Working Width per Passage

The working width per passage shall mean the width kept under

the following spaces.

Inter-row-space:

Inter-row-space between the adjoining passages:

Note (2) Testing Plot and its Location

Location:

(soil prepared plot by a tractor)

Soil condition of testing plot:

State of pulverization

Degree of leveling

. Degree of exposed stubs

4. Degree of wet or dry condition of soil

(2) Feeding Section Performance Test

1) Opening Degree Test

which show the feeding amount at different opening degrees converted into 10 ares under the field work condition stated in (1). However, in case of the multi-rows The results of this test have been recorded as followings. The figures of

degree of the feed-shutter. The value shown outside of the parenthesis is the mean shows the maximum and minimum feeding amount for each outlets under its opening inter-row spacing between the passages). The numerical value in the parenthesis seeding with seed-grains of wheat and ordinary compound fertilizer, the Cm (20 Cm of space between the rows and 25 Cm of value of feeding amount for each outlet. degree of the feed-shutter. The value shown o value of feeding amount for each outlet. width of passage shall be

	Number of feed-roll		Aver of the	Average feeding ar of the feed-shutter	amount at d	Average feeding amount at different degrees of the feed-shutter	ees
Materials	shaft rev- olutions tested	Items	Minimum degree	Approx. 1/4 open-	Approx. 1/2 open-	Approx. 3/4 open-	Full
	(r.p.m.)	(unit)		ing degree	ing degree ing degree	ing degree	
Seed-grains of paddy		Degree of open- ing adjustment					
rice Note (4)		Multi-rows seeding: rows					
		(kg/10 a)					
Seed-grains of wheat		Degree of open- ing adjustment					
Note (4)		Multi-rows seeding: rows					
		1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2					

(kg/10.2)	fertilizer Note (4) Ordinary compound fertilizer Note (4)	Multi-rows seeding: rows (kg/10.a) Degree of open- ing adjustment Multi-rows seeding: rows
Remarks	Remarks	(kg/10 a)

follows:	.swc					
	Normal number of feed	Opening degree	Average ar	Average amount of feeding (kg/10 a)	ng (kg/10 a)	
Materials	roll shaft revolutions N (r.p.m.)	tested	At normal speed, (3)	15% lower than N	15% higher than N	Remarks
Seed-grains of paddy rice,						
Highly compound found fertilizer (4)						

number of revolutions as optimum speed by a manufacturer at the The normal number of feed-roll shaft revolutions is the indicated time of inspection. Note (3)

(3) Continuous Running Test on the Bench

The results of continuous running test on the bench for 3 hours made under the following conditions have not shown any noticeable abnormalities.

shut- -roll Remarks	gree I shaft
Opening degree of feed shutter and number of feed-roll shaft revolutions	at the same opening degree and r.p.m. of feed-roll shaft as stated in (2)-1.
Method of material use and tested quantities	Seed-grains: 1 kg/1 seeding (circulating use) Fertilizer: 10 kg/1 seeding row
Materials	Seed-grains of paddy rice and highly compound fertilizer Note (4)

The materials which have of those qualities mentioned hereunder have been used for this test. Note (4)

Weight of 1,000 grains: Harvesting year: Seed-grains of paddy rice

Grain-weight per litter:

Seed-grains of wheat

Harvesting year:

Weight of 1,000 grains:

Grain-weight per litter:

Highly compound fertilizer

Ratio of component: 10: 20: 20 Size of particle: 1.2 - 4.8 mm (4 - 16 mesh)

Grain-weight per litter:

Ordinary compound fertilizer Ratio of component: 8: 8: 5
Size of particle: 1.2 - 4.8 mm

(4) Reference Records to Handling

(The following records show the condition for the articles listed hereunder at the time of inspection.)

Balance weight	Position and	Adjusting	Position of	Confirming	Taking-out
at the time of	type of clutch	system of	hopper	method of the	method of the
field work test	lever	opening		remained amount	remained
		degree		inside of hopper	amount inside
					of hopper

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## INSPECTION RECORD SHEET

THE INSTITUTE OF AGRICULTURAL MACHINERY

> Kind of agricultural machinery

on the dry paddy field and wheat seeding on the dry field), (Multi-Hills Planting Type) Fertilizing Seeder (Combined use for rice direct-sowing

Manufacturer is type

Hanufacturer's name and add.

Type's name of the tractor used in this test for fitting the "Fertilizing Seeder on test"

Main Structure

(i) Dimension of Body and Weight

(The numerical value shown herein shall mean the measured value under the condition of being fitted the "Fertilizing Seeder on test" to the tractor.)

Overall length	Overall width	Overall height	Gross		Remarks	
win.	<b></b>	E E	Ř	Seeds, fertilizers (over 80% of each capacity), regular amount of lubricating oil and water shall be included in the gross weight.	rs (over 80% of ar amount of lu all be included	each bricating in the
(2) Pos	(2) Position of Power	ower Take-Off		Seed-feeding: Fertilizer-feeding:	: Ba	
(3) Stru	Structure of Feed	ing-Sectior	ι (exclusiv	Feeding-Section (exclusive of the fertilizer feeding part)	feeding part)	
Feeding	Type of feeding mechanism		ust-	ਹੈ. ਹ	Capacity of hopper	No. of feeding outlets

		No. of feeding	siermo		
ding:	r feeding part)	Capacity of hopper			
Seed-feeding: Fertilizer-feeding:	e of the fertilize	Adjusting degree and	feeding amount		
ke-Off	eeding-Section (exclusive of the fertilizer feeding part)	ust- ism	amount		
(2) Position of Power Take-Off	ure of Feeding-	Type of feeding	mediamism		
(2) Positi	(3) Structure of F	Feeding section		Seed-feeding part	

(4) Adjusting Range and Mechanism for Ground Contacting Part

Maximum       Adjusting range       Method of hole       Position of hole       Space between         number of for space be-seeding-rows       digging on the digging wheel       the rows         seeding-rows       tween the rows       ground         Cm       Cm			<del></del>
Adjusting range Method of hole for space beding in the digging wheel tween the rows ground cm	ue		
Adjusting range Method of hole for space beding in the digging wheel tween the rows ground cm	ě		ļ <u>ģ</u>
Adjusting range Method of hole for space bedingging on the tween the rows ground Cm	\$		) O
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Maximum number of seeding-rows	7 44		
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Summary of Inspection Records (See Note (4) for seed-grains used in this test.) m - 115

(1) Field Work Performance Test (See Note (2) for the condition of testing plot and its location.)

followings. And the time required for the field work converted into 10 ares has been considered as proper working hours from the standpoints of structure and number of The results of the field work test and working condition have been recorded as seeding rows of the "Fertilizing Seeder on test".

With regard to the state of germination has been recognized as proper sprout looking through the records of germination survey.

Opening degree of the feed-shutter for seed feeding		Remarks		Om O
Position No. of of of change seed feed. gear ing outlet		Time required for the field work converted into 10 ares	min	
Position of chang gear		Tim for wor into		
Track of Fread Cype Range g of track	S	Time required for turning	Oe s	Passage rows:
Space between the rows	CB	lling	m/s	Working Width per Passage Space between the rows:
No. of seeding rows		Trave		Working Space be
Date of test		o dth	Ē	Note (1)
ion Mork & Fried 12 12 12 12 13 13 14 15 15 15 15 15 15 15 15 15 15 15 15 15	Seed-grains of paddy rice Note (4)	Working width per passage Note (1)		Not
ion d Work	Condition of Fig.	Records	gnitesT.	

Remarks	
Time required for the field work converted into 10 ares	
Time required for turning	
Travelling speed m/s	
Working width per passage Note (1)	
ting Records	Les

	ne adjoing passage
Note (1). Working Width per Passage	ws: /een th
Note ((1)	

te (2) Testing Plot and its Location
Location: (soil prepared plot by a

Soil condition of testing plot:

- 1. State of pulverization 2. Degree of leveling
- 3. Degree of exposed stubs 4. Degree of wet or dry
- (2) Feeding Section Performance Test
- 1) Opening Degree Test

shows the maximum and minimum feeding amount for each outlet under its opening converted into the amount per hole. And the numerical value in the parenthesis The following figures show the feeding amounts at different opening degrees degree of the feed-shutter. The value shown outside of the parenthesis is the mean value of feeding amount for each outlet.

olu- ted (ur Degre openin adjust (grain adjust Hill-p ing: 1	feed-roll shaft revolutions tested  (r. p.m.)  Number of Average reeding amount at different degrees of the feed-shutter  Minimum Approx. Approx. Approx. Item  (unit) degree ing degree ing degree of the degree of the feed-shutter  Minimum Approx. Approx. If the feed-shutter  I / 4 open- I / 2 open- I / 3 / 4 open- I / 2 open- I / 2 open- I / 3 / 4 open- I / 2 open- I / 3 / 4 open- I / 3	Degree of opening adjustment	Hiel-plant- ing: rows (grains/ hole)	Degree of opening adjustment	Hill-plant- ing: rows (grains/ hole)	
--	---	------------------------------	--------------------------------------	------------------------------	--------------------------------------	--

2) Feed-Roll Shaft Speed-Change Test

The feeding amount has been changed in accordance with speed-change as

### follows:

	Normal num-	Opening	Averag	Average amount of feeding (grains/hole)	feeding )	
Marchais	shaft revolutions N (r.p.m.)	tested	at normal 15% lov speed, (3) than N	at normal 15% lower 15% higher speed, (3) than N than N	15% higher than N	Kemarks
Seed-grains of paddy rice Note (4)						

The normal number of feed-roll shaft revolutions is the indicated number of revolutions as optimum speed by a manufacturer at the time of inspection. Note (3)

## (3) Continuous Running Test on the Bench

The results of continuous running test on the bench for 3 hours made under the following conditions have not shown any noticeable abnormalities.

Materials	Method of material use	Opening degree of feed shut-	Remer reme
	and tested quantities	shaft revolutions	
	Seed-grains:	At the same opening degree	
Note (4)	1 kg/1 seeding row	and r. p. m. of feed-roll shaft	
	(circulating use)	as stated in (2)-1.	

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Oliowing materials nave been used in this test.	Harvesting year: Weight of 1,000 grains: Grain-weight per litter:	Harvesting year: Weight of 1,000 grains: Grain-weight per litter:		ecords show the conditions for the articles listed hereunder		
t) ine lollowing materials nav	Seed-grains of paddy rice	Seed-grains of wheat	(4) Reference Records to Handling	ollowing records show the condit	of inspection.)	
		20		(The following r		

Position Confirming Taking-out  of method of the method of the remained remained amount amount inside of hopper of hopper	Others		
t Position and Adjusting type of system of clutch lever opening degree	Fitting method to the tractor		al Remarks
Balance weight at the time of field work test		-12	Z 4. Additional Remar

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	Fitting method to the tractor	

## INSPECTION RECORD SHEET

Kind of agricultural machinery

Certificate No.

Fertilizing Seeder (For rice direct-sowing use on the dry paddy field), (Power Tilling Type or Pull Type Seeder)

THE INSTITUTE OF AGRICULTURAI

MACHINERY

Manufacturer's type designation

ال ك Manufacturer's name and add. ي

Type's name of the tractor used in this test for fitting the "Fertilizing Seeder on test" to it.

2. Main Structure

(1) Dimension of Body and Weight

(The numerical value shown herein shall mean the measured value under the con-

dition of being fitted the "Fertilizing Seeder on test" to the tractor.)

Remarks	kg Seeds, fertilizers (over 80% of each capacity), regular amount of lubricating oil and water shall be included in the gross weight.
Overall weight	- Si
Overall height	mm
Overall width	mm
Overall length	mm

	and position for of feeding amount hor	of hopper	Number of feeding outlets
Seed-feeding part			
Fartilizor feeding part			

Main parts of	Hopper	Feeding	Feeding Fe	Feeding	Remarks
feeding section		pox	roll-shaft	roll	
Materials used for fertilizer fecding part					Materials used at the time of inspec- tion.

records show the conditions of tilling tines, pressure-roller, screaper and soil (4) Structure of Ground Contacting Part and its Adjusting Range. (The following

covering device at the time of inspection.)

e e	No. of	Adjusting	Kinds of tilling	Kinds of tilling   Size of pressure   Type of   Relative posi-	Type of	Relative posi-	
	rows	range of inter-space	tines and number of tines	roller (mm) and number of	screaper	tion between seed and	
<b>Cm</b>				roller		fertilizer	
		С'n					<u> 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 </u>

3. Summary of Inspection Records

(See Note (4) for seed-grains and fertilizer used at the time of inspection.)

(1) Field Work Performance Test, (See Note (2) for the condition of testing plot and its location).

-followings: -- And the time-required for the field work converted into 10 ares has been The results of the field work test and working condition have been recorded as

considered as proper working hours from the standpoints of structure and number of seeding rows of the "Fertilizing Seeder on test".

With regard to the state of germination has been recognized as proper sprout look-

ing through the records of germination survey.

Opening degree of feed shutter Seeds Ferti-	
Openir of feec Seeds	
feeding Ferti- lizer	
No. of outlets Seeds	
Position No. of feeding of outlets change Seeds Fertigear	Main Aux. Tilling
Track or tread Type Range of	mm
tween	Cm
test No. oN swor	rows
Date Of	
Item	Condition of field work at the time of inspection

Item.	Working	orking Travelling Time re-	Time re-	Hours re-	Hours re- Relative position Remarks	Remarks
	width of	speed	quired	quired	between seed	
	one pas-		for	for 10 ares	for 10 ares and fertilizer	
	sage, (1)		turning	of field		
				work		
		-				
Testing	CB	m/s	sec	min		
records for						
the field						
work						

Note (1) Working Width per Passage

The working width per passage shall mean the width kept under the following spaces.

Inter-row-space: Cm

Inter-row-space between the adjoining passages: Cm

Note (2) Testing Plot and its Location

Location: (soil prepared plot by a tractor)

Soil condition of testing plot:

. State of pulverization

2. Degree of leveling

3. Degree of exposed stubs

4. Degree of wet or dry condition of soil

(2) Feeding Section Performance Test

Opening Degree Test

the field work condition stated in (1). However, in case of the multi-rows seeding show the feeding amount at different opening degrees converted into 10 ares under The results of this test have been recorded as follows. The figures of which

cetween the passages). The numerical value in the parenthesis shows the maximum value shown outside of the parenthesis is the mean value of feeding amount for each feeding amount for each outlets under its opening degree of the feed-shutter. The Cm (20 Cm of space between the rows and 25 Cm of inter-row spacing with seed-grains of wheat and ordinary compound fertilizer, the width of passages snall be

Materi-	Number of		Average f	eeding amov	Average feeding amount at different degrees of	ent degrees	of
als	feed-roll		the feed-shutter	hutter			
	shaft revo	- Item	Minimum Approx.	Approx.	Approx.	Approx.	Full
	lutions		degree	1/4 open-	1/2 open-	3/4 open-	Open
	tested			ing degree	ing degree	ing degree	
	(r. p. m.)	(unit)					
Seed-		Degree of open-					
grains		ing adjustment					
Note (4)		Multi-rows seed-					
		ing: rows					
		( kg/10 a)					
Ferti-		Degree of open-					
lizer		ing adjustment					
Note (4)		Multi-rows seed-					
		ing: rows					
		(kg/10a)					
D 0 100							
TACITICA TOTAL							

Foed-Roll Shaft Speed-Change Test

The feeding amount has been changed in accordance with speed-change as

follows

Materials	Normal number of	Opening	Average amount of feeding	nount of fee	ding	Remarks
	feed roll shaft revo-	degree	(kg/10 a)			
	lutions N (r. p. m.)	tested	At normal	At normal   15% lower   15% higher	15% higher	
			speed, (3) than N	than N	than N	
Seed-						
grains	というのでは、100mmのでは、100					
Note (4)						
Fertilizer						
Note (4)						
					The second second	X
是一个的一种,就是是我们的一种。						

Note (3) The normal number of feed-roll shaft revolutions is the indicated number  inspection.

(3) Continuous Running Test on the Bench The results of

The results of continuous running test on the bench for 3 hours made under the

following conditions have not shown any noticeable abnormalities.

Materials	Method of material use	nod of material use Opening degree of feed shutter and	Remarks
	מטמ ופצופת לתמוודונים:	number of feet-fold shall revo- lutions	
Note (4)	Seed-grains: 1 kg/1 seed-	-grains: 1 kg/1 seed- At the same opening degree and	
	ing row (circulating use)	row (circulating use) r. p. m. of feed-roll shaft as	
	Fertilizer: 10 kg/l seed-stated in (2)-1.	stated in (2)-1.	
	ingrow		

Note (4) The following fertilizer and seed-grains have been used for this test. Seed-grains Harvesting year: Weight of 1,000 grains: Grain-weight per litter:

Ratio of compound fertilizer)

Ratio of component: 10:20:20

Size of particle: 1.2-4.8 mm

Weight per litter: kg

(4) Reference Records to Handling

(The following records show the conditions for the articles listed hereunder at the time of inspection.)

;				
Taking-out method of the remained amount inside of hopper				
me ine de			Tenant I	
Taking-out methoof the remained amount inside of hopper				
g-c re nt i				
Taking- of the r amount				
Te of arr ho				
pot	Others			
neth ned e of	Ott			
ng n nair side				
min ren t in				
nfir he oun per				
Confirming meth of the remained amount inside of hopper				
<u> </u>				
Positio of hopper				
of of for				
of				
Adjusting system of opening degree	OH			
Adjusti system opening degree	lact			
0 0 U	Fitting method to the tractor			
osition and pe of utch lever	the contraction of the contracti			
ositior Pe of urch l	ğ	S		
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υ Δ΄ Δ΄ L	ŭ	Records		
of of test	ting			
we Ime	打打	Lou		
nce e tj wo		Additional		
Balance weight at the time of field work test		4		
		4.		
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### INSPECTION RECORD SHEET

Certificate No.

Date:

THE INSTITUTE OF AGRICULTURAL MACHINERY

> Kind of agricultural machinery

Fertilizing Seeder (For rice direct-sowing use on the dry paddy field) - (Multi-Hills Planting Type)

Manufacturer's type designation Manufacturer's name and add.

1. Type's name of the tractor used in this test for fitting the "Fertilizing Seeder on test"

to it.

2. Main Structure

(I) Dimension of Body and Weight

(The numerical value shown herein shall mean the measured value under the

condition of being fitted the "Fertilizing Seeder on test" to the tractor.

	a grand the c
Remarks	kg each capacity), regular amount of lubricating oil and water shall be included in the gross weight.
Gross weight	kg
Overall height	mm // f
Overall width	mm
Overall length	<b>unu</b>

Adjusting Range and Mechanism for Ground Contacting Part (4)

		La de la company	
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Space be- tween the	Santa. Z	O	ŀ
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Method of hole digging on the			
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Adjusting range for space be-	tween the rows		
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Summary of Inspection Record (See Note (4) for seed-grains used in this test)

(1) Field Performance Test (See Note (2) for the condition of testing plot and its

The results of the field work test and working condition have been recorded as followings. And the time required for the field work converted into 10 ares has been considered as proper working hours from the standpoints of structure and number of seeding rows of the "Fertilizing Seeder on test".

with regard to the state of germination has been recognized as proper aprout looking through the records of germination survey.

Cm m/s sec  Vorking Width per Passage  pace between the rows:
21 9
Note (1)

			1
Remarks			
Time required for the field work converted	into 10 ares	mim	
Travelling Time required speed for turning		ပ <b>မ</b> ်	
Travelling speed		m/s	
Working width per passage Note (1)		Cm	
Item			

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Vorking Width per Pa	pace between the row nter-row-space betwo
Working Width per Pa	Space between the row Inter-row-space betwo
Working Width per Pa	Space between the rows: Inter-row-space between the adjoining passages:
Working Width per Pa	Space between the row Inter-row-space between
Working Width per Pa	Space between the row Inter-row-space between
() Working Width per Passage	Space between the row Inter-row-space between
(1) Working Width per Pa	Space between the row Inter-row-space between
(1) Working Width per Pa	Space between the row Inter-row-space between
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Note (1) Working Width per Pa	Space between the row Inter-row-space between
Note (1) Working Width per Pa	Space between the row Inter-row-space betwe
Note (1) Working Width per Pa	Space between the row Inter-row-space between

Testing Plot and its Location Note (2)

(soil prepared plot by a tractor

Soil condition of testing plot:

- State of pulverization
- 2. Degree of leveling
- 3. Degree of exposed stubs
- 4. Degree of wet or dry condition of soil
  - 1) Opening Degree Test (2) Feeding Section Performance Test
- The following figures show the fecding amounts at different opening degrees

converted into the amount per hole. And the numerical value in the parenthesis

shows the maximum and minimum feeding amount for each outlet under its

opening degree of the feed-shutter. The value shown outside of the parenthesis is the mean value of feeding amount for each outlet.

	Full				
တ္တ					
gree	Approx. 3/4 open- ing degree				
nt de	ppro//4 o				
feren					
t dif	Approx. 1/2 open- ing degree				
ınt a	Approx. 1/2 open- ing degree				
mou					
ing hutte	Approx. 1/4 open- ing degree				
feed ed-s	Appr /4 o				
Average feeding amount at different degrees of the feed-shutter	7				
Aver of th	num e				
	Minimum degree				
Ag:	\ \alpha \ \bar{\bar{\bar{\bar{\bar{\bar{\bar{		(e)		
	ftern (unit)	ee of ing stment	-plant- rows ins/ hole)		
	Ife (w	Degree of opening adjustmen	ا ما ما		
		D G g	Hill ing: (gre		
of	volu sted )				
Number of feed-roll	shaft revolutions tested (r.p.m.)				
Nur	she tion (r. i				
			Note (4)		
alsi	Mater	surs rice	Seed-gr s of padd)	Remark	

) Feed-Roll Shaft Speed-Change Test

The feeding amount has been changed in accordance with speed-change as

fellows:

	Normal num-		Averag	Average amount of feeding	f feeding	
	ber of feed roll	Opening		(grains/hole)	e)	Domarie
Marerials	shaft_revolutions	degree	At normal	15% lower	At normal 15% lower 15% higher	
	N (r. p.m.)	tested	speed, (3)	than N	than N	
Seed-grains of paddy rice, (4)						

number of revolutions as optimum speed by a manufacturer at the The normal number of feed-roll shaft revolutions is the indicated time of inspection. Note (3)

(3) Continuous Running Test on the Bench

The results of continuous running test on the bench for 3 hours made under the

following conditions have not shown any noticeable abnormalities.

ter ft Remarks	ff.	d for this test.	onditions for	Taking-out method of the remained amount inside of hopper	
Opening degree of feed shutter and number of feed-roll shaft revolutions	At the same opening degree and r.p.m. of feed-roll shaft as stated in (2)-1.	ne following seed-grains of paddy rice have been used for this test, of paddy rice  Harvesting year:  Weight of 1,000 grains:  Grain-weight per liter:	ecords to Handling (The following records show the conditions for d hereunder at the time of inspection.)	Confirming Tamethod of the of remained am amount inside hoper	
Opening degrand number	At the same and r.p.m. as stated in	ns of paddy Harvest Weight o	e following e of inspec	Position of hopper	
laterial use uantities	ed-grains: 1 kg/1 seeding row (circulating use)	g seed-grair ice	Handling (Th m at the time	Adjusting system of opening degree	
Method of material use and tested quantities	Seed-grains: 1 kg/1 seeding r (circulating use)			Position and type of clutch lever	
Materials	Note (4)	Note (4) T Seed-grains	(4) Reference R the articles lister	Balance weight at the time of field work test	

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Additional Remarks

### INSPECTION RECORD SHEET

Date:

THE INSTITUTE OF AGRICULTURAL MACHINERY

Kind of agricultural machinery

Certificate No.

Fertilizing Seeder (For wheat seeding use), (Power Tilling Type)

Manufacturer's type designation H. Manufacturer's name and add.

1. Type's name of the tractor used in this test for fitting the "Fertilizing Seeder on test" to it.

- 2. Main Structure
- (1) Dimension of Body and Weight

(The numerical value shown herein shall mean the measured value under the condition of being fitted the "Fertilizing Seeder on test" to the tractor:)

~ 140 -

Remarks	Seeds, fertilizers (over 80% of each capacity), regular amount	of lubricating oil and water shall be included in the gross weight.
Gross weight	kg	
Overall Overall Gross length width height weight	mm	
Overall width	шш	
Overall (length	mm .	
Method of seeding	Deep placement	Multi-rows seeding

length width height weight  mm mm kg  Sower Take-Off Seed-feeding:  Fertilizer-feeding:  Cof feed-  Of feed-  Type of adjusting Adjustin feeding a feeding amount  facting box  Feeding box  Feeding Feeding  Feeding roll-shaft  Feeding		Seeds, fertilizers (over 80% of each capacity), regular amount	lubricating oil and water shall included in the gross weight.				Capacity Number of of feeding hopper cutlets			Remarks	Materials used at the time of inspection.
Dower Take- Sower Take- of feed- nechanism			of lubricati be included	feeding:	lizer-feeding:	ials Used				lt.	Materi of insp
Sower Feedjinechar	width	m.m.			Ferti	ng-Section and Mater					
그 6대 - 대한 사고인 변 - 대한 - 사고 그림 - 단신인 (한 그 전투를 가고하는 - 몇만 1대 - 스탠리 - 터 - 및 다	lengt	Deep placement seeding	Multi-rows seeding	(2) Position of Power		(3) Structure of Feedi	Type of fee ing mechan	Seed-feeding part	Fertilizer feeding part	Main parts of Hopper feeding section	Materials used for fertilizer

Main parts of Hopper Feeding box Feeding Feeding Remarks feeding section roll-shaft roll Materials used the time for fertilizer feeding part		Đ.
Hopper Feeding box Feeding Feeding roll-shaft roll		it the tim
Hopper Feeding box Feeding Feeding roll-shaft roll	Remarks	ials used a
Hopper		Mater of insp
Hopper	Feeding roll	
Hopper	Feeding roll-shaft	
Hopper	Feeding box	
Main parts of feeding section Materials used for fertilizer feeding part	opper	
	Main parts of feeding section	Materials used for fertilizer feeding part

Structure of Ground Contacting Part and its Adjusting Range (<del>7</del>

(The following records show the conditions of tilling tines, pressure-roller,

screaper and soil covering device at the time of inspection.)

Method of	Max. available	ax. available   Seeding width or   No. of tilling   No. of pres- Type of	No. of tilling	No. of pres-	Type of
seeding	number of rows	adjustable range for inter-row-	tines and type sure rollers screaper and size	sure rollers and size	screaper
		space		(mm)	
Deep place- ment seeding Multi-rows seeding					

3. Summary of Inspection Records

(See Note (4) for seed-grains and fertilizer used at the time of inspection.)

(1) Field Work Performance Test (See Note (2) for the condition of testing plot and its location.)

followings. And the time required for the field work converted into 10 ares has been considered as proper working hours from the standpoints of structure and number of seeding rows of the "Fertilizing Seeder on test". The results of the field work test and working condition have been recorded as

With regard to the state of germination has been recognized as proper sprout looking

through the records of germination survey.

nutter silit			Remarks		
Opening degree of feed-shutter			Relative posi- tion between drop-down seed and fertilizer		
0 0 0 -19H 0 -2ili1			\		
Numb feedin outlet			Time required for the field work converted into 10 ares	min	mim
Position of change gear	Main Aux. Tilling	Main Aux. Tilling	Time required for the field work converted into 10 ares		
			Time re- quired for turning	o es	sec
Type track of track of track	mm	ww			
tween rows	Cm	E	Travelling speed	s/m	m/s
Seeding width No. of rows Space be-		rows	of of (1)	Cm	E
rest to stad			Worki width one pa		<b>t0</b>
Method of seading	Deep place- ment seeding	Multi- rows seeding	Method of seeding	Deep placement seeding	Multi-rows seeding
Field Work	lo noitib	пoЭ	conds	aA gaite	τę

Working Width per Passage Note (1)

double that of seeding, and in case of the multi-rows seeding, the inter-Working width per passage for the deep placement seeding shall be

Note (2)

row spacing shall be 20 Cm and 25 Cm for a passage.

Testing Plot and its Location

The testing plot for the deep placement seeding and multi-rows seeding have been selected the following conditioned fields.

1. Location:

1. Location:
2. Height of stub (in D plot):
Height of stub (in M plot):

State of foot stamping (in D plot): State of foot stamping (in M plot):

Moisture content in soil (in D plot): Moisture content in soil (in M plot):

5. Space between rows (Cm) x Space between hills (Cm) (in D plot):

Remarks: "D plot" and "M plot" shall mean the testing plot for the deep placement seeding and multi-rows seeding respectively.

- (2) Feeding Section Performance Test

converted into 10 ares under the field work condition stated in (1). And the numeri-The following figures show the feeding amounts at different opening degrees each outlet under its opening degree of the feed-shutter. The value shown outside cal value in the parenthesis shows the maximum and minimum feeding amount for of the parenthesis is the mean value of feeding amount for each outlet. Opening Degree Test

	Item	Average feed feed feed	eeding am er	ount at diffe	Average feeding amount at different degrees of the feed-shutter	s of the
្នាំ shaft revo- ក្នាំ lutions		Minimum Approx. degree 1/4 open-		Approx. 1/2 open-	Approx. 3/4 open-	Full
M (r. p. m.)	(unit)			ing degree	ing degree	
	Degree of opening adjustment					
enis18- 16 (4)	Deep placement sending: outlets (kg/10 a)					
bəs2 Vo	Multi-rows seeding rows (kg/10 a)					
	Degree of opening adjustment					
( <del>4</del> ) ə1	Deep placement seeding: outlets (kg/10 a)					
Tertii No	Multi-rows seeding: rows (kg/10 a)					
Remarks						

2) Feed-Roll Shaft Speed-Change Test

The feeding amount has been changed in accordance with speed-change as

### follows:

Materials   Norma	Normal number	Opening	Average am	Average amount of feeding (kg/10 a)	ng (kg/10 a)	Remarks
	of feed roll	degree	At normal   15% lower	15% lower	15% higher	
	shaft revolutions	tested	speeds, (3) than N	than N	than N	
	N (r. p.m.)					
Seed.						
grains						
Note(4)						
Ferti-						
lizer						
Note (4)						
		W				

number of revolutions as optimum speed by a manufacturer at the Note (3) The normal number of feed-roll shaft revolutions is the indicated time of inspection.

## (3) Continuous Running Test on the Bench

The results of continuous running test on the bench for 3 hours made under the following conditions have not shown any noticeable abnormalities.

9		s test.								
Remarks		d for thi								
Opening degree of feed shutter and number of feed-roll shaft revolutions	At the same opening degree and r.p.m. of feed-roll shaft as stated in (2)-1.	owing fertilizer and seed-grains have been used for this	Harvesting year:	Weight of 1,000 grains:	Grain-weight per litter:	(Ordinary compound fertilizer)	Ratio of component: 8:8:5	Size of particle: 4 - 16 mesh. (12 - 48 mm)	Weight per litter:	
Materials Method of material use Or and tested quantities nu	row )) row	Note (4) The following fertili				Fertilizer				
Materials	Note (4)									

(4) Reference Records to Handling

(The following records show the conditions for the articles listed hereunder at the time of inspection.)

Balance weight Position and	Position and	Adjusting	Position	Confirming	Taking-out
at the time of	type of clutch	system of	Jo	method of the	method of the
field work test le	lever	opening	hopper	remained amount remained	remained
		degree		inside of hopper amount inside	amount inside
					of hopper
	March College Water States & States				
Fitting met	nethod to the tractor	ctor		Others	

### INSPECTION RECORD SHEET

Date:

THE INSTITUTE OF AGRICULTURAI MACHINERY

Kind of agricultural machinery

Certificate No.

Fertilizing Seeder (For wheat seeding use)

(Pull Type Seeder)

Manufacturer's type designation Manufacturer's name and add.

Type's name of the tractor used in this test for fitting the "Fertilizing Seeder on test"

. Main Structure

(1) Dimension of Body and Weight

(The numerical value shown herein shall mean the measured value under the condition of being fitted the "Fertilizing Seeder on test" to the tractor.)

	- H
Remarks	kg Seeds, fertilizer (over 80% of each capacity), regular amount cf lubricating oil and water shall be included in the gross weight.
Gross weight	Kg.
Overall height	<b>mm</b>
Overall width	mm
Overall length	<b>uuu</b>

(2) Position of Power Take-Off

Secd-feeding: Fertilizer-feeding:

(3) Structure of Feeding-Section and Materials Used

Feeding	Type of feeding mechanism	pe of Type of adjusting Adjusting degree Capacity ding mechanism for and position for of chanism feeding amount hopper	Adjusting degree and position for feeding amount	Capacity of hopper	Number of feeding outlets
Seed-feeding part					
Fertilizer feeding part					

	AND THE RESERVE OF THE PARTY OF				
	Adjusting	Kinds of tilling Size of pressure	Size of pressure		Relative position
No. of	range of	tines and number	tines and number   roller (mm) and   Type of	Type of	between seed and
rows	inter-row	of tines	number of roll-	screaper	fertilizer
	space		ers		
	Cm				

Summary of Inspection Records

(See Note (4) for seed-grains and fertilizer used at the time of inspection.)

(1) Field Work Performance Test (See Note (2) for the condition of testing plot and its location.)

considered as proper working hours from the standpoints of structure and number of followings. And the time required for the field work converted into 10 ares has been The results of the field work test and working condition have been recorded as seeding rows of the "Fertilizing Seeder on test" With regard to the state of germination has been recognized as proper sprout

looking through the records of germination survey.

ng de- xí feed r Ferti- lizer		Remarks		
Opening degree of feed shutter Seeds lize				
No. of feed- ing outlets Seeds Ferti-		Relative position between seed and fertilizer		
Position of change gear		Time re- quired for 10 ares of the field work	mim	
Track or tread Range Type of track	<b>tu</b> tu	Time required for turning	0 0	
Space be- tween rows	E	Travel- ling speed	s/m	
Date of test no. of awor gains rows		Working width of one pas-sage, (1)	E O	
Item	Condition of field work at the time of inspection	Item	Testing re- cords for the field work	

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	Remarks		
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		Testing re- cords for the field work	1. 2.
			12/21
	A		

Working Width per Passage

The working width per passage shall mean the width kept under the

Inter-row-space: 20 Cm following spaces.

Inter-row-space between the adjoining passages: 25 Cm

Testing Plot and its Location

(soil prepared plot by a tractor)

Soil condition of testing plot:

State of pulverization

Degree of leveling

Degree of exposed stubs

Degree of wet or dry condition of soil

(2) Feeding Section Performance Test

1) Opening Degree Test

converted into the amount per 10 ares. And the numerical value in the parenthesis shows the maximum and minimum feeding amount for each outlet under its opening The following figures show the feeding amount at different opening degrees degree of the feed-shutter. The value shown outside of the parenthesis is the mean value of feeding amount for each outlet.

Degree of opening adjustment	Multi-rows speeding: rows (kg/10 a)	Degree of open- ing adjustment	Multi-rows speeding: rows (kg/10 a)	
		<del>,</del>	<del></del>	

The feeding amount has been changed in accordance with speed-change as 2) Feed-Roll Shaft Speed-Change Test follows:

	Norm ber o	Opening	Average an	Average amount of feeding $(kg/10 a)$	ng (kg/10 a)	f
Materials	roll snait revolutions N (r. p.m.)	degree tested	At normal speed, (3)	15% lower than N	15% higher than N	Kemarks
Seed-grains Note (4)						
Fertilizer Note (4)						

number of revolutions as optimum speed by a manufacturer at the Note (3) The normal number of feed-roll shaft revolutions is the indicated time of inspection.

(3) Continuous Running Test on the Bench

The results of continuous running test on the bench for 3 hours made under the following conditions have not shown any noticeable abnormalities.

<b>A</b> eterials	Method of material use and tested quantities	Opening degree of feed shutter and number of feed-roll shaft revolutions	Remarks
	Seed-grains:	At the same opening	
	1 kg/l seeding row	degree and r.p.m. of	
Note (4)	(circulating use)	feed-roll shaft as	
	Fertilizer:	stated in (2)-1.	
	10 kg/l seeding row		

Note (4) The following qualities of seed-grains and fertilizers have been used for this test.

8:8:5 4~16-mesh (1.2 - 4.8 mm) (Ordinary compound fertilizer)
Ratio of component:
Size of particle:
Weight per litter: Harvesting year:
Weight of 1,000 grains:
Grain-weight per litter: for this test.

Seed-grains

(4) Reference Records to Handling

(The following records show the conditions for the articles listed hereunder

at the time of inspection.)

Balance weight	Position and Adjusting type of system of	Adjusting system of	Position of	Confirming method of the	Taking-out method of the remained
field work test	clutch lever	·	hopper	remained	amount inside of
		degree		amount inside	hopper
				of hopper	
Fitting	Fitting method to the tractor	ractor		Others	s

### 4. Additional Remarks

## INSPECTION RECORD SHEET

THE INSTITUTE OF AGRICULTURAL MACHINERY

> Kind of agricultural machinery

Certificate No.

Fertilizing Seeder (For wheat seeding use), Fertilizing Seeger (For wiese (Multi-Hills Planting Type)

Manufacturer's type designation

9 Manufacturer's name and add.

1. Type's name of the tractor used in this test for fitting the "Fertilizing Seeder on test"

2. Main Structure

(1) Dimension of Body and Weight

(The numerical value shown herein shall mean the measured value under the

condition of being fitted the "Fertilizing Seeder on test" to the tractor.)

Remarks	Seeds, fertilizers (over 80% of each capacity), regular amount of lubricating oil and water shall be included in the gross weight.
Gross	kg
Overall height	mim
Overall width	<b>ww</b>
Overall length	<b>uu</b>

(2) Position of Power Take-Off

Seed-feeding: Fertilizer-feeding:

Seed-feeding:
Fertilizer-feeding:
(3) Structure of Feeding-Section (exclusive of the fertilizer feeding part)

Feeding T section fe	Type of feeding mechanism	Type of adjusting mechanism for feeding amount	Adjusting degree and position for feeding amount	Capacity of hopper	No. of feeding cutlets
Seed- feeding part					

(4) Adjusting Range and Mechanic, for Ground Contacting Part

Space between	the rows			
Position of hole	digging wheel			
Method of hole	digging on the	ground		
Adjusting range for   Method of hole   Position of hole   Space between	space between the digging on the digging wheel	rows	Cm	
Maximum number	of seeding rows			

Summary of Inspection Records. (See Note (4) for seed-grains used in this test.)

(1) Field Work Performance Test. (See Note (2) for the condition of testing plot and its location.)

considered as proper working hours from the standpoints of structure and number of followings. And the time required for the field work converted into 10 ares has been The results of the field work test and working condition have been recorded as seeding rows of the "Fertilizing Seeder on test".

 Item		S	ц	Track or	Position	No. of feeding Opening degree	Opening degre	<b>0</b>
	10	Jo Jo		tread	Jo	outlets	of feed shutter	14
	); 93	bə ws	M 2 CM	Type Range of change	change	Seeds Fert-	Seeds Ferti-	. 1
	Ds Ds	0N se o1	ro pe Sb	track	gear	lizer	lizer	
Condition of field			Cm	mm				
 work at the time					-		*	
of inspection								ٔ ۲

marks	
red Re of	<b>E</b>
Time required Remarks for 10 ares of the field work	<b>i</b>
Travelling Time required speed for turning	ပ ဏ
Travelling speed	m/s
Working width of one passage Note (1)	C B
Item	Testing records for the field work

# Note (1) Working Width per Passage

The working width per passage shall mean the width kept under

the following spaces.

Inter-row-space: Cm Inter-row-space between the adjoining passages:

Testing Plot and its Location Note (2)

(used the field after harvesting rice) Location:

Soil condition of testing plot:

Height of stub: Cm State of foot stamping:

Height of stub: Cm
 State of foot stamping:
 Moisture content in soil:
 Space between rows (Cm) x

Space between rows (Cm) x Space between hills (Cm)

(2) Feeding Section, Performance Tea

degree of the feed-shutter. The value shown outside of the parenthesis is the mean shows the maximum and minimum feeding amount for each outlet under its opening The following figures show the feeding amounts at different opening degrees converted into the amount per hole. And the numerical value in the parenthesis 1) Opening Degree Test value of feeding amount for each outlet.

p1.	Number of feed-roll	Ifem	Average feed feed	eeding amou	Average feeding amount at different degrees of the feed-shutter	it degrees o	f-the
ei1935M	sheft revo- lutions tested (r.p.m.)	(tiun)	Minimum Approx. degree 1/4 oper degree	Approx. 1/4 opening degree	Approx. Approx. Approx. 1/4 opening 1/2 opening degree degree	Approx. 3/4 opening. degree	Full open
suis		Degree of open- ing adjustment					
Seed-gr Note (4)		Hill-planting: rows (grains/bole)					
Re	Remarks						

2) 'eed-Roll Shaft Speed-Change Test

The feeding amount has been changed in accordance with speed-change as

Materials Normal	Normal number	Opening	number Opening Average amount of feeding (grains/hole) Remarks	unt of feeding	(grains/hole)	Remarks
	of feed roll shaft revolution N (r.p. m.)	degree tested	At normal speed, (3)	15% lower   15% higher than N than N	15% higher than N	
Speed- grains Note (4)						

number of revolutions as optimum, speed by a manufacturer at the time-of inspection.

(3) Continuous Running Test on the Bench

The results of continuous running test on the bench for 3 hours made under the following conditions have not shown any noticeable abnormalities. Note (3' The normal number of feed-roll shaft revolutions is the indicated

Materials	Method of material use and	of material use and   Opening degree of feed shutter and   Remarks	Remarks
	tested quantities	number of feed-roll shaft revolutions	
Note (4)	Seed-grains:	At the same opening degree and	
	1 kg/l seeding row	r.p.m. of feed-roll shaft as	
	(circulating use)	stated in (2)-1.	

The following seed-grains have been used for this test. Note (4)

Seed-grains:
Harvesting year:
Weight of 1,000 grains:
Grain-weight per-litter:

(4) Reference Records to Handling

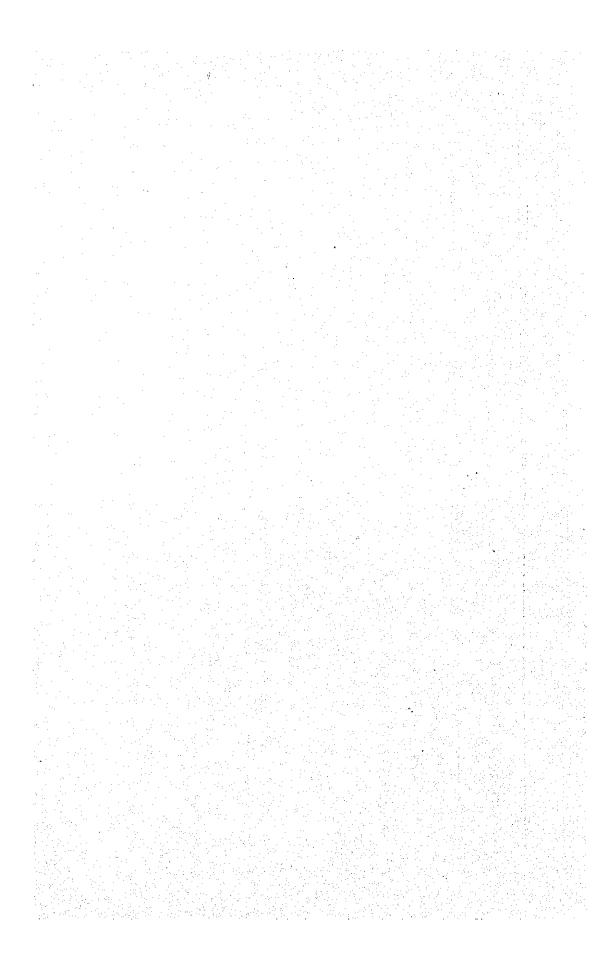
(The following records show the conditions for the articles listed hereunder at the

time of inspection.)

ָיט .		· ·			
Position and Adjusting Position Confirming Taking-out method	method of the of the remained	remained amount inside of	hopper		
Confirming	method of the	remained	amount inside hopper	of hopper	
Position		100			
Adjusting	system of of	opening hopper	degree		
Position and	type of	clutch lever			
Balance weight at	the time of field	work test			

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4. Additional Remarks



# I-3. POWER SPRAYERS

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#### I - 3 POWER SPRAYERS

(Date of Public Notice in Official Gazette: October 22, 1962.)

#### 1. Scope

The standard specified testing methods and procedures of inspection of the reciprocating pump type Power Sprayers for agricultural use, but the variable stroke type is excluded herefrom.

#### 2. Definition of Terms

The meaning of terms to be used in this standard shall be defined as follows:

#### 2.1 Full-Equipment

The full-equipment means the state of the machine body equipped with the engine, base-frame, supply-pipe and over-flow pipe, (regular amount of cooling water shall be included when the water cooled engine is mounted on the body), and the regular amount of lubricating oil and 80% of fuel tank capacity shall be filled under the above condition of the full-equipment.

# 2.2 Normal Working Pressure, Specified Revolutions and Maximum Working Pressure

These mean the indicated normal working pressure, number of revolutions of sprayer shaft and the maximum working pressure on the specification.

# 2.3 Main Shaft

Main shaft means the first shaft to which the power is transmitted from a Prime Mover.

# 3. Procedures of Inspection

The inspection shall be made by the following items:

#### 3.1 Items to be Inspected

- (I) Verification of the Specification
- (2) Test of Efficiency
- (3) Test of Pressure Adjustment
- (4) Continuous Running Test
  - (5) Treatment Test
  - (6) Spraying Performance Test
  - (7) Investigation after Disassembling
  - (8) Pressure-Resistance Test of Air Chamber

# 3.2 General Conditions for Inspection

# (1) Preliminary Running

The power sprayer to be put on the test (hereinafter referred to as the "Power Sprayer on test"), shall be considered to have been run-in enough prior to the test. The preliminary running for efficiency and continuous running tests shall be within 60 minutes respectively.

# (2) Liquid to be Used

# 1) Fresh Water

Here temperature covers temperature range from 0° to 40°C and the weight per unit volume of liquid shall be taken for fresh water as 1 kg/:

# 2) Lime Solution

The temperature ranges from 0° to 40°C and rate of dilution shall be as follows:

Lime 20g: Fresh water 1,000 cc

#### 3) Fuel and Lubricating Oil

Fuel and lubricating oil to be used for the test shall conform to the specification and be easily available at the market. The regular amount of lubricating oil shall be filled before the test and shall not, as a rule, be exchanged throughout the test of spray performance.

#### (4) Measuring Instruments

Main instruments to be used for measuring shall have been checked and caliberated prior to the measurements, and shall be capable of taking the following minimum scale and accuracy:

Main purpose of use	Kind of instrument	Required minimum scale and accuracy
Measurement of number of main shaft revolutions	Hasler tachmeter	The instrument shall be capable of reading down to $\pm 1\%$ of the measured value.
Measurement of hours	stop watch	Minimum scale: less than 0.2 sec.
Measurement of	electric dynamo-	capable of reading
torque	meter	down to 1% of the maximum meas- ured value
Measurement of	resistant-wire,	allowable error
pressure	pressure meas-	should be within
	uring apparatus	$\pm$ 1% of the rating value.

Main purpose of use	Kind of instrument	Required minimum scale and accuracy
Measurement of pressure	Bourdon tube type, pressure gauge	Minimum value: less than 1 kg/Cm²
Measurement of discharge volume	electromagnetic type, flow meter	within the range of $\pm$ 1% of the rating value
Measurement of temperature	centigrade thermo- meter	capable of taking finer scale than 1°C
Measurement of weight	platform scale	capable of reading down to 2% of load applied.
Measurement of overflow volume	floating type, flow meter	Minimum scale: less than 0.2 / Cm <sup>2</sup>
Measurement of pressure resistance	high pressure, hand pump	Minimum scale: less than 5 kg/Cm <sup>2</sup>

# (5) Adjustment of "Power Sprayer on Test" During the Test

No adjustment, such as refilling oil, more tightening cylinder packing and so forth, shall be permitted while carrying out the test in principle.

# (6) Suspension of Test

When one of each test stops more than 3 times or longer than 30 minutes, the test shall be stopped. However, the test which may be stopped irrespective of manufacturer's responsibility shall be recovered.

# 3.3 Methods of Test and Investigation

# 3.3.1 Verification of Structure

# (1) Object

The object of this investigation is to ascertain the main dimensions, weights, materials, equipments and so forth in comparison actual things of the Power Sprayer on test with the said items indicated on the specification.

# (2) Items to be Investigated

- 1) Dimension of the Body under the Full-Equipment
  - (a) Overall height
    Overall length
    Overall width
  - (b) Gross weight

# Body

- (a) To investigate either vertical type or horizontal type
- (b) Single acting or double acting
- (c) Kinds of pressured parts

  Number of pressured parts

  and dimensions of the pressured parts
- (d) Number of discharge ports
- (e) Capacity of air chamber
- (f) Power transmission system
- (g) Outside diameter of sprayer pulley
- (h) Number of belts and sizes
- (i) Kind of lubricating oil and quantity of regular filling
- (j) Kind of packing

- (k) Other necessary items
- 3) Prime Mover
  - (a) Type
  - (b) Cooling system
  - (c) Number of strokes
  - (d) Rated horsepower and rated number of revolutions
  - (e) Starting system
  - (f) Capacity of fuel tank and kinds of fuel
  - (g) Other necessary items

#### 4) Attachments

- (a) Size of base-frame
- (b) Inside diameter of suction pipe and overflow pipe
- (c) Mesh of (wire net) strainer
- (d) Type of main nozzle
- (e) Other necessary items

# 5) Materials

- (a) Base-frame
- (b) Air chamber
- (c) Pressured part
- (d) Valve and valve seat
- (e) Cylinder packing
- (f) Frame of body
- (g) Other necessary items

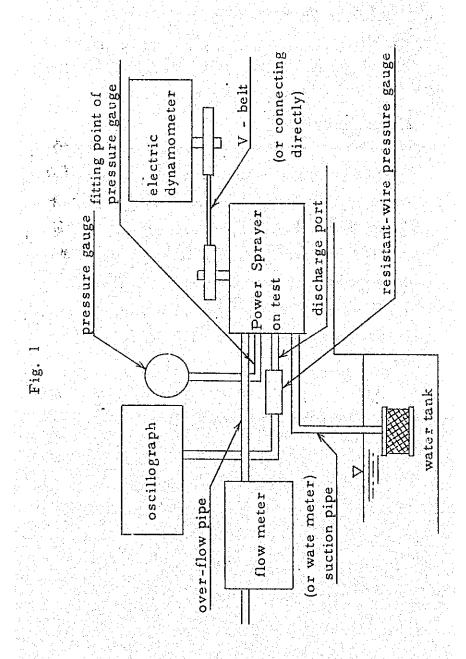
# 3.3.2 Test of Efficiency

# (1) Object

The object of this test is for ascertaining the pump efficiency of the Power Sprayer on test.

# (2) Testing Equipment

- 1) The measurement of the required power for driving the sprayer shaft shall be made by an electric dynamometer coupled to the V-belt or direct connecting to the Power Sprayer on test.
- 2) The measurement of discharge volume shall be measured by a flow meter or a water meter.
- 3) The measurement of pressure shall be made by a pressure gauge which shall be fitted to the discharge port.
- 4) The testing equipment to be used for this test shall, as a rule, conform to Fig. 1.



# (3) Testing Method

- 1) Number of revolutions for the test shall be kept at the specified speed and 30% increased speed more than the number of specified revolutions of main shaft.
- 2) Testing pressure shall be taken more than 4 states involving the normal working pressure and the maximum working pressure.
- 3) Fresh water shall be used for the test and operation of power sprayer shall be carried out by means of the total over-flow operation (which means the operation by utilization of total volume of discharge in the arrangement of getting it back through the over-flow pipe. However, in case of the rate of discharge measured by a water meter shall be calculated by the hour required for discharging a certain volume.

# (4) Items to be Measured

- 1) Required horsepower
- 2) Rate of discharge
- 3) Pressure
- 4) Other necessary items

# (5) Calculation

Required horsepower, hydraulic power and pump efficiency shall be calculated by the following formulae:

$$B = \frac{W \cdot N}{K}$$

where, B : required horsepower (Ps)

W: load on the end of the dynamometer (kg) N: number of revolutions of the

dynamometer (rpm

K: coefficient given to the dynamo.

meter

$$W = \frac{10 P \times Q}{75 \times 60}$$

where, W : hydraulic power (Pg)

P : pressure (kg/cm)

Q: rate of discharge (l/min)

Pump efficiency (%) =  $\frac{W}{B}$  x 100

#### 3.3.3 Pressure Adjustment Test

#### (1) Test of Pressure Fluctuation

#### Object

The object of this test is to ascertain the effects on decrease of pressure fluctuation due to the air chamber and other functions.

# 2) Testing Equipment

The equipment to be used for this test shall, as a rule, conform to the equipment and apparatus as shown in Fig. 1 of 3.3.2.

# 3) Testing Method

- (a) Number of revolutions for the test shall conform to the specified number of main shaft revolutions.
- (b) Testing pressure. The test shall be carriout under the specified normal working pressure
  for 30 minutes, and the state of fluctuation of
  pressure and the center fluctuation shall be

recorded by an oscillograph.

(c) The test shall be carried out with fresh water under the condition of total over-flow operation.

#### 4) Items to be Measured

The fluctuation range by pressure and the vibration difference from the center all recorded in the oscillograph shall be calculated at first and then the ratio to the pressure at the time of measuring shall be given in percentage.

#### (2) Capacity Test of Pressure Regulating Valve

#### 1) Object

The object of this test is to ascertain the pressure regulating performance of regulating valve for the Power Sprayer on test under less volume of the overflow operation.

# 2) Testing Equipment

The testing equipment shall, as a rule, conform to the equipment of 3.3.2. An flow meter shall be connected to the top of over-flow pipe.

# 3) Method of Test

- (a) The test shall be carried out under the normal working pressure and specified number of main shaft revolutions.
- (b) The test shall be made with fresh water under the total over-flow operation.

#### 4) Items to be Measured

The pressure-drop shall be measured, in case of 90% of suction volume discharged to the discharge port under the total over-flow operation. The ratio between decreased pressure and the normal working pressure shall be given in percentage.

#### 3.3.4 Continuous Running Test

#### (1) Object

The object of this test is to ascertain the operating condition and that there is no development of irregularities, abnormalities and troubles under the continuous running of the Power Sprayer on test.

#### (2) Equipment

- 1) The Power Sprayer on test shall be operated under the condition of the full-equipment.
- 2) The measuring part of thermometer shall be placed on the surface of the body and bearing-parts of the Power Sprayer on test. And it shall be inserted into lubricating oil.

# (3) Testing Method

- 1) The test shall be carried out under the following conditions: At the speed of specified revolutions of main shaft and maximum working pressure.
- 2) The test shall be made continuously for 5 hours with lime solution under the total over-flow operation.
- 3) The volume of lime solution shall be prepared to keep about 10 times that of discharging per minute by the Power Sprayer on test.

- 180 -

# (4) Measurements and Items to be Investigated

The following items shall be measured and investigated during the continuous running of the Power Sprayer on test.

- 1) Temperature of lubricating oil
- 2) Atmospheric temperature
- 3) Surface temperature of various parts on the body
- 4) Fluctuation of pressure
- 5) Vibration
- 6) Noise
- 7) Liquid leakage
- 8) Oil leakage
- 9) Any abnormality on various parts of the body

#### 3.3.5 Handling Test

#### (1) Object

This test is made for the purpose of ascertaining ease or otherwise of handling the Power Sprayer on test.

# (2) Test Method

The investigation shall be required to do by more than two investigators using the Power Sprayer on test.

# (3) Items to be Investigated

- 1) Easiness of transporting the power sprayer
- 2) Easiness of operating the power sprayer
- 3) Safety
- 4) Easiness of adjusting various parts of the body
- 5) Other necessary matters

#### 3.3.6 Spraying Performance Test

#### (1) Object

The object of this test is to ascertain the spraying performance of nozzle-part, pressure resistance, water leakage, any abnormalities on the parts of nozzle, spray. cock, spray-rod and extension-boom, etc.

#### (2) Testing Equipment

Rubber-hose, spray-rod, nozzle and spray-pipe shall be connected to the discharge port before running of the Power Sprayer on test.

# (3) Testing Method and Items to be Investigated

- 1) The state of spraying shall be checked under the conditions of the normal working pressure and specific number of main shaft revolutions.
- 2) The investigation shall be made on the spray-cock, spray-pipe and nozzle part for the purpose of seeing water leakage and any abnormality under the operation of the Power Sprayer at the normal working pressure and specified number of main shaft revolutions.

# 3.3.7 Investigation after Disassembling

# (1) Object

The object of this test is mainly to ascertain that there is no development of irregularities and abnormalities on the Power Sprayer on test after having carried out the continuous running test.

# (2) Items to be Investigated

This investigation shall be made for ascertaining of any abnormalities, on the Power Sprayer on test after

disassembling it completely, and if necessary, the measurement and investigation shall be taken for fitting condition, hardness, processing and touch degree of finishing, etc.

#### 3.3.8 Pressure Resistance Test of Air Chamber

#### (1) Object

The object of this test is for ascertaining the pressureresistance of air chamber for the Power Sprayer on test.

#### (2) Testing Equipment

The air chamber shall be taken off from the Power Sprayer on test; and then, it shall be connected to the pump by a copper-pipe.

#### (3) Testing Method

The air chamber shall be subjected for 30 sec. to pressure of five times that of the normal working pressure or three times that of the maximum working pressure when five times of the normal working pressure is less than three times of the normal working pressure.

# 4. Standards to Pass the Inspection

The decision of inspection for Power Sprayers of agricultural use shall conform to the following specified standards, and shall be required to satisfy the respective requirement stipulated hereunder:

# 4.1 Performance Inspection

(1) The pump efficiency in the test of 3.3.2 shall be over 63% in case of over 6 /min. in the actual measured

discharge-rate (1) respectively.

- Note (1) The actual measured discharge-rate shall be the rate of discharge under the normal working pressure and specified number of main shaft revolutions.
- (2) The central fluctuation of pressure in the test of
- 3.3.3-(1) shall be below 15% under the normal working pressure and specified number of main shaft revolutions.
- (3) The fluctuation of pressure in the test of 3.3.3-(1) shall be below 30% in case of the single and double-cylinder under the normal working pressure.
- (4) The pressure-drop in the test of 3.3.3-(2) shall be below 40% of the normal working pressure.
- (5) The test of 3.3.8 shall have no abnormalities such as the liquid leakage and failure.
- (6) Spray particles shall be uniformly distributed and spray volume shall be even.

# 4.2 Durability Inspection

The durability inspection shall be required to satisfy the requirements specified hereunder, particularly in principal parts and parts which may be difficult to replace easily.

- (1) No abnormalities and failures in the above mentioned parts
- (2) No liquid and oil leakages
- (3) No abnormal abrasion
- (4) No seizure
- (5) To have the necessary measures taken against corrosion

# 4,3 Handling Inspection

- (1) Handling condition shall not show any defects that may bring much dangerous feelings to the operator during the operation of the Power Sprayer in the test of 3.3.5.
- (2) No defects that shall be the cause of difficulty to replace or adjust the parts during the operation of the Power Sprayer in the test of 3.3.5.

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		Date:	
Certificate No.		THE INSTITUTE OF	OF AGRICULTURAL
Kind of agricultural machinery	Power Sprayer	MACHINERY	
Manufacturer's type designation			
Manufacturer's name and	dadd.		
1. Main Specification			
Specified number of main-shaft revolutions	Specified number of crank-shaft revolutions	Normal working pressure	Maximum working pressure
<b>u</b> d <b>a</b>	rpm	kg/cm <sup>2</sup>	kg/cm <sup>2</sup>

Main Structure

# (1) Dimensions

Body Full-equipment	Classification	Overall length (mm)	Overall width (mm)	Overall height (mm)	Gross weight (kg) Note $(1)$
Full-equipment	Body				
	Full-equipment $(1)$				

(1) Gross weight shall include 80% of fuel, regular amounts for lubricating oil, cooling water and liquid respectively.
(2) Besides the body, the following items shall be included in the fullequipment. Note (1)
Note (2) B

(2) Structure of Body and Materials Used

								<del></del> -
Materials			to, of dis-	harge ports			Remarks	
Kind				<u> </u>			te casing olume	
Materials			Air chan		သ		ting oil in th	
Stroke	mm		ulating					
Diameter	<b>uu</b>		ressure reg alve				Materials used for the casing	
Kind							if the body Outsider digmeter	
pump			Suction valve Discharge va	Type   Ma			Selt-pulley o	
	Kind Diameter Stroke Materials Kind	Kind Diameter Stroke Materials Kind mm mm	Kind Diameter Stroke Materials Kind mm mm	Kind Diameter Stroke Materials Kind mm mm mm Fressure regulating Air chamber Materials Kind Materials Kind	Kind       Diameter       Stroke       Materials       Kind         n valve       Pressure regulating       Air chamber       No.         rige valve       valve       Materials       Capacity       Materials	Kind     Diameter     Stroke     Materials     Kind       n valve and ringe valve     Pressure regulating valve     Air chamber       Materials     Type     Materials     Capacity     Materials	Kind     Diameter     Stroke     Materials     Kind       n valve and regulating valve     Pressure regulating valve     Air chamber       Materials     Type     Materials     Capacity     Materials       Cc     Cc	Kind Diameter Stroke Materials Kind   mm

	Cylinder Packing	Materials		No. of dis-	charge ports		Remarks
	Cylin	Kind		nber	Materials		the casing Volume
		Materials	<b>c</b>	Air chamber	Capacity	ာ	Lubricating oil in the casing Kind Volume
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or body and Materials Osed	Press	Diameter	<b>du</b>	Pressure regulating valve	Туре		Materials used for the casing
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	Type of	dund		Suction valve and Discharge valve	Type		Belt-pulley of th Type  Type
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3. Summary of Inspection Record

(1) Pump Performance

The results of test made under the following specified conditions have been re corded as shown in Fig. (1).

	Remarks	
Outside Dia. of belt pulley	e Number of for dynamo- Re belts meter	
Belt used	Number of belts	
Bel	Туре	
Room	temper- ature	U °
pesn p	Temp.	Ö
Liqui	Kind	

(2) The test of pressure regulating performance shall conform to the conditions of (1). revolutions and total over-flow operation, the pressure drop has been marked less than In the case when the discharging 90% of total suction volume by opening the dis-40%, and there has not shown any development of irregularities in other pressure charge-cock under the running conditions of normal working pressure, specified regulating performance.

(3) Spraying Performance Test

Unevenness of spraying			any abnor-		arks	Lime solution: Diluted 1 of water with 20 g of lime.
Rate of spraying	.mim/		as not shown		Rem	Lime solut l of water lime.
Max. reaching distance	<b>w</b>		g conditions h	hours.	Liqwid used	Lime solution
Pressured part of nozzle			the followin	ing test for	nber of in-shaft olutions	rpm
ang th hose	<b>u</b>	3.5.t	le unde	us runn	Nur ma rev	
Jo		ning T	st mad	ntinuo	sure	kg/cm <sup>2</sup>
side dia. Pose	<b>ww</b>	nons Rum	sult of te	ter the co	Pres	
Type of Innozzle of		(4) Contin	The re	malities af	Room temperature	ů
	Inside dia. Length Pressured Max. Rate of of hose nozzle distance	Inside dia. Length Pressured Max. Rate of of hose nozzle distance mm kg/cm² m/min.	Inside dia. Length Pressured Max. Rate of of hose nozzle distance spraying hose mm kg/cm² m/min.	Inside dia. Length Pressured Max.  of hose nozzle distance spraying spraying spraying conditions has not shown an	f Inside dia. Length part of reaching spraying of hose nozzle distance distance mm kg/cm² m/min.  Continuous Running Test  The result of test made under the following conditions has not shown an ies after the continuous running test for 3 hours.	Inside dia. Length Pressured Max.  In Dart of reaching spraying distance of hose nozale distance distance mozale distance where the following conditions has not shown an anotation of test made under the following conditions has not shown an anotation of the following test for 3 hours.  In Mumber of Pressure main-shaft Liquid used Remarrevolutions

(4) Continuous Running Test

The result of test made under the following conditions has not shown any abnormalities after the continuous running test for 3 hours.

Remarks	Lime solution: Diluted 1 of water with 20 g of lime.
Liquid used	Lime solution
Number of main-shaft revolutions	rpm
Pressure	kg / cm <sup>2</sup> .
Room temperature	Ç

(5) Pressure-resistance Test of Air Chamber

Remarks	
Ä	
Pressured time	30 sec.
ρι	
Pressure tested	Kg/cm <sup>2</sup> (5 times of that of normal working pressure) (3 times of that of max, working pressure)

Reference Records concerning the Handling (showing the state at the time of inspection.

F Additional Doman

"我们是我们的,我们就是我们的,我们就是我们的,我们就是我的人,我们就是我们的,我们就会会看到这样的。"	
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그 그 그는 어느 나는 이번 모든 그리고 하는 사람이 되는 것이 어느로 살아 가지 않는 그래요?	
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