



FPM DELJANIN

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— ROT 700

ROTO SITNILICA
ZA OBRADU ZEMLJIŠTA



- SRB** Uputstvo za rukovanje i održavanje
- GB** Instruction for work and maintenance

CE



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1.0 DEKLARACIJA O USAGLAŠENOSTI

Ovaj uređaj je proizveden u skladu sa važećim Evropskim normama o bezbednosti proizvoda i Pravilniku o bezbednosti mašina (*"Sl. glasnik RS", br. 13/2010*)

DEKLARACIJA O USAGLAŠENOSTI

Izjava broj: 01-2014

Proizvođač:	FPM "DELJANIN" 18430 Kuršumlija, Toplička 121
Naziv proizvoda:	ROTACIONA SITNILICA
Model/Tip:	ROT-700
<p>FPM "DELJANIN" izjavljuje da je gore navedeni proizvod usaglašen sa bitnim zahtevima Mašinske direktive 2006/42 EC Annex I i da je proizvod konstruisan i dizajniran u skladu sa navedenim harmonizovanim standardima.</p>	
<p>Ocena usaglašenosti je vršena po proceduri koja se odnosi na EC verifikaciju utvrđenu u Annex VIII Mašinske direktive 2006/42 EC</p>	
Primenjeni harmonizovani standardi:	<ul style="list-style-type: none"> – EN ISO 4254-1:2013 Poljoprivredne mašine - Bezbednost Deo 1: Opšti zahtevi – EN ISO 4254-5: 2011 Poljoprivredne mašine-Bezbednost-Deo 5; Mašine za obradu zemljišta sa pogonjenim radnim elementima – ISO 3744:2010 Akustika — Određivanje nivoa zvučne snage i nivoa zvučne energije izvora buke na osnovu zvučnog pritiska — Inženjerska metoda za približno slobodno polje iznad refleksione ravni – EN ISO 11201:2010 Akustika — Buka koju emituju mašine i oprema — Određivanje nivoa zvučnog pritiska emisije na radnom mestu i na drugim definisanim položajima u približno slobodnom polju iznad refleksione ravni, sa neznatnim korekcijama okoline – EN ISO 13849-1:2010 Bezbednost mašina - Delovi sistema za upravljanje koji se odnose na bezbednost - Deo 1: Opšti principi za projektovanje. – EN ISO 13849-2:2010 Bezbednost mašina - Delovi sistema za upravljanje koji se odnose na bezbednost - Deo 2: Validacija – EN ISO 12100:2010 Bezbednost mašina-opšti principi za projektovanje-Procena rizika i smanjenje rizika – ISO/TR 14121-2:2012 Bezbednost mašina - Procena rizika Praktična uputstva, primeri i metode – ISO 3864-1:2011 Grafički simboli – Boje i znakovi sigurnosti – Deo 1: Principi projektovanja znakova sigurnosti i oznaka sigurnosti. – ISO 3864-2:2004 Grafički simboli – Boje i znakovi sigurnosti – Deo 2: Principi projektovanja oznaka sigurnosti na proizvodima
<p>FPM "DELJANIN" izjavljuje da je isključivo odgovoran za navedeni proizvod da je konstruisan i dizajniran u skladu sa Annex I Mašinske direktive 2006/42 EC i referentnim harmonizovanim standardima. Potpisan za i u ime:</p> <p>.....</p>	
<p>Mesto i datum izdavanja : 18430 Kuršumlija , 1/2014-05-13 Ime: Nenad Deljanin Pozicija: direktor</p>	

2.0 UVOD

2.1 Namena uputstva

Namena ovog uputstva je da omogući pravilnu primenu mašine, uspešno rukovanje i održavanje u radu. Pažljivo proučavanje ovog uputstva pružiće Vam korisna obaveštenja kako u pripremi mašine, tako i u radu sa istom.

Velika raznovrsnost uslova rada u praksi ne daje mogućnost da sve bude obuhvaćeno ovim uputstvom, ali su na jasan način izneti svi bitni elementi podešavanja mašine zahtevima praktične primene.

2.2. Mere bezbednosti

2.2.1 Opšte napomene



Pre nego što započne bilo kakav rad roto sitnilicom potrebno je da rukovaoc pročita uputstvo za rukovanje i održavanje i da se pridržava navedenih upozorenja i na taj način zaštiti i sebe i druge od mogućih povreda. Na taj način obezbediće i pouzdan rad oruđa.



PAŽNJA !
RADI VAŠE BEZBEDNOSTI
 Dobro proučite uputstvo



Ovaj simbol upućuje na važna bezbednosna uputstva koja, ukoliko ih se ne pridržavate, mogu da naruše ličnu bezbednost i / ili imovinu . Pročitajte sva uputstva i pridržavajte ih se pre upotrebe roto sitnilice. Nepridržavanjem-narušavate svoju bezbednost i povećavate mogućnost povrede.

Uz simbol opasnosti koriste se i upozoravajući pojmovi:

OPASNOST – Ova reč označava opasnu situaciju koja, ako se ne izbegne, izaziva ozbiljne povrede ili smrt. Znak bezbednosti koji sadrži reč "OPASNOST" treba da bude korišćen retko i samo za one situacije koje predstavljaju najozbiljniju opasnost.

UPOZORENJE – Ova reč označava potencijalno opasnu situaciju koja, ako se ne izbegne, može izazvati ozbiljne povrede ili smrt. Opasnosti označene rečju "UPOZORENJE" predstavljaju niži stepen rizika od onih označenih rečju "OPASNOST".

PAŽNJA – Ova reč označava potencijalno opasnu situaciju koja, ako se ne izbegne, može rezultirati manjom ili srednjom povredom. Reč "PAŽNJA" može se takođe upotrebiti za upozorenje na postupke u nekim operacijama koji mogu dovesti do povreda.

2.2.2 Opšta uputstva za bezbedan rad

- Rotacionom sitnilicom ne bi smeo da rukuje niko, ko nije pročitao celo uputstvo i razumeo sve napomene.

- Proveriti da li su štitnici na priključnom vratilu traktora, kardanskom vratilu sitnilice i reduktoru pravilno postavljeni i dobro pričvršćeni.
- Obavezno koristiti odgovarajuće osigurače na rukavcima kardanskog vratila kada se ti rukavci postavljaju na nazubljena pogonska vratila traktora i mašine, da bi se izbegle povrede.
- Nikad se ne približavati kardanskom vratilu i priključnom oruđu kada je u pokretu.
- Posle agregatiranja ugastiti motor traktora pre nego što se započnu bilo kakva podešavanja ili proveravanja na ovoj priključnoj mašini.
- Uvek proveriti da li su svi noževi sitnilice na broju.
- Uvek proveriti da li su svi zavrtnjevi, kojima su motičice vezane za noseći radni disk, dobro pričvršćeni.
- Proveriti da li su dobro pričvršćeni svi zavrtnjevi, kojima su noževi privezani za prirubnicu radne osovine.
- Pre svakog korišćenja sitnilice podesiti, s obzirom na stanje zasada koji se obrađuje:
 - ugao pod kojim mašina stoji u odnosu na horizontalu zemljišta u pravcu normalnom na osu traktora i ugao pod koji mašina stoji u odnosu na zemljište u pravcu ose traktora.
- Tek kad su sva podešavanja i provere izvršeni, pokreće se motor traktora, ali prethodno još jednom proveriti da li je isključena poluga za pogon kardanskog vratila.
- Uvek prvo odignuti mašinu sa zemlje, pa tek onda uljučiti pogon kardanskog vratila.
- Zabranjeno je da se za vreme rada bilo ko vozi na mašini ili na polugama traktora.
- Po završenom radu potrebno je prvo isključiti mašinu odgovarajućom ručicom, a zatim je spustiti.
- Kada se roto sitnilica ostavlja bez prisмотрe, obavezno je spustite na zemlju, zaustavite motor traktora i izvadite ključ.
- Kad se mašina odvaja od traktora, obratiti pažnju da zauzme stabilan položaj dok leži na zemlji.

2.2.3. Znakovi upozorenja na mašini za bezbedan rad

Na nosećoj konstrukciji mašine postavljeni su znakovi upozorenja za bezbedan rad u vidu nalepnica sa slikovnim prikazom potencijalnih opasnosti, koje nisu mogle biti izbegnute konstrukcijskim rešenjima. Njihovo značenje je opisano u daljem tekstu.

Pročitati pažljivo sve o njima i održavati nalepnice u dobrom stanju. Ukoliko su oznake nevidljive, oštećene ili otpale, treba ih zameniti novim. Rezervne oznake možete kupiti kod prodavaca mašine ili servisnog zastupnika. Postojeća opasnost označena je upozoravajućim trouglom, a upozorenje o izbegavanju povreda prikazano je ilustracijom.

Evo tih znakova:



Proučiti uputstvo za rad - Uputstvo za rad sadrži važne informacije za bezbedan rad oruđem.



Ne podešavati mašinu u radu. Isključiti motor i izvaditi ključ pre početka rada na održavanju popravci ili podešavanju.



Ne voziti se na poteznicama traktora i mašini - Strogo je zabranjeno voziti se na poteznicama traktora kao i na mašini zato što može doći do ozbiljnih povreda



Održavati bezbedno rastojanje od mašine u toku rada - Obavezno održavati bezbedno rastojanje od sitnilice, pogotovo od rotirajućih noževa koji mogu prouzrokovati povredu stopala.



Ne otvarati ili skidati zaštitne oklope dok oruđe radi - U protivnom može doći do ozbiljnih povreda.



Ostati na bezbednom rastojanju u toku rada – Opasnost od izbačenih kamenčića ili neki drugi čvrsti predmeti mogli bi izazvati povrede.



Rotirajući elementi-čuvaj ruke



Upozoravajuća nalepica koja vas upozorava na redovnu obaveznu kontrolu vijaka.

2.3 Opis rotacione sitnilice

Rotaciona sitnilica FPM „DELJANIN“ je oruđe za obradu zemljišta sa aktivnim reznim alatima-motičicama sa horizontalnom osom obrtanja koja je prinudno pogonjena sa priključnog vratila traktora. To je oruđe nošenog tipa a priključuje se na traktore I i II kategorije koji raspolažu sistemom vezivanja u tri tačke.

Rotaciona sitnilica je veoma podesna za:

- rad kako u ravničarskim tako i u nagnutim terenima
- kvalitetnu obradu zemljišta za setvu
- međurednu oradu zemljišta u vinogradima i voćnjacima u toku cele godine
- mešanje mineralnog đubriva i biljnih ostataka sa zemljom kao i očuvanje strukture i povećanje plodnosti zemljišta

Sitnilica se sastoji iz tri glavna podsklopa (modula):

- Priključni nosač
- Transmisijski modul koji obezbeđuje maksimalno korišćenje snage traktora preko priključnog vratila traktora.
- Radni modul-rotor sitnilice sa reznim noževima koji svojim oblikom , geometrijom i rasporedom obezbeđuje kvalitetnu obradu zemljišta u svim uslovima i radnim režimima uz minimalni utrošak energije.

2.3.1 Priključni nosač roto sitnilice

Priključni sklop služi za priključivanje sitnilice na traktor, podešavanje radnog položaja i nošenje radnih elemenata. Na priključnom nosaču nalaze se priključne tačke koje omogućavaju priključivanje na traktore I i II kategorije bez ikakvih dodataka. Oruđe se podiže u transportni i radni položaj pomoću komandne ručice hidraulika traktora.



Slika 1. Priključni nosač

2.3.2 Transmisijski modul



Slika 2. Transmisijski modul

2.3.3 Radni modul



Slika 3. Radni modul sitnilice-rotor

2.4 Tehničke karakteristike

Oznaka/Tip	.....	ROTO SITNILICA-ROT 700
Dužina	.....	900 mm
Širina	.....	2200 mm
Visina	.....	800 mm
Širina radnog zahvata	.....	700 mm
Transmisija	.....	Mehanička
Centralni prenosnik	.....	Zupčasti
Regulisanje dubine oranja	.....	Mehaničko pomoću kliznih oslonaca (papuče ili „skije“)
Dubina obrade	.....	Radna 0,15m, max 0,2 m iz dva prolaza
Tip rotora	.....	Sa horizontalnom osom obrtanja
Rezni aparat	.....	Rotirajući, sa režućim dejstvom, optimalnog oblika, geometrije i rasporeda, za različite uslove i stanja zemljišta
Način priključivanja	.....	Nošena varijanta u tri tačke
Broj obrtaja rotora	.....	540 o/min
Masa	.....	250 kg

2.5 Identifikacija mašine

Identifikaciju oruđa možete izvršiti pomoću natpisne pločice, koja se nalazi na levoj strani Roto sitnilice na rezervoaru za hidraulično ulje.

Pločica sadrži sledeće oznake:

- Naziv i adresu proizvođača;
- U polju naziv mašine njen pravi naziv;
- U polju "Tip" upisana je komercijalna oznaka proizvoda;
- U polju serijski broj upisan broj mašine;
- U polju Masa upisana je masa mašine izražena u (kg).

Prilikom naručivanja rezervnih delova i traženja objašnjenja treba obavezno navesti tip mašine i serijski broj.

FPM "DELJANIN" 18430 Kuršumlija Toplička 121, www.fpmdeljanin.com 	
Naziv mašine:	ROTO SITNILICA
MODEL/TIP	ROT 700
Serijski broj:	
God. proizvodnje:	
Masa :	250 kg

3.0 RUKOVANJE ROTACIONOM SITNILICOM

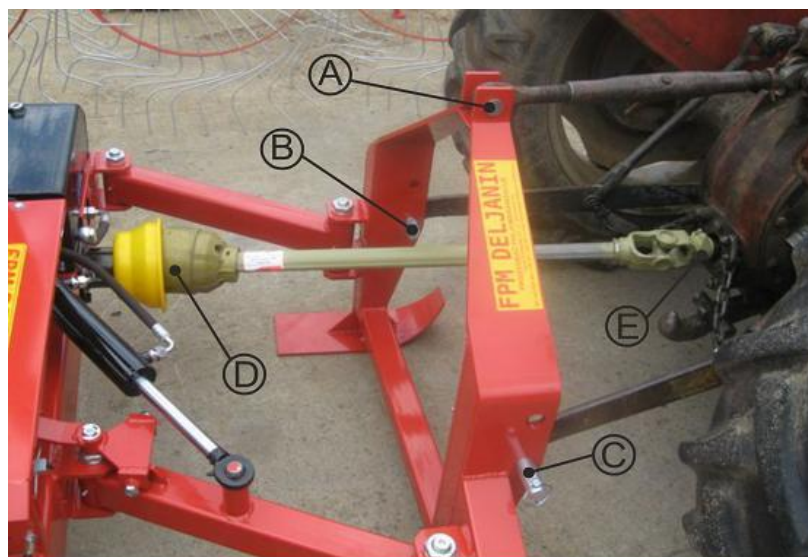
Pre upotrebe neophodno je proveriti dali su svi delovi (navrtke, zavrtnjevi i drugo) dovoljno pritegnuti a posebno je potrebno učvrstiti noževe na rotoru. Ishabane delove i oštećene noževe odmah zameniti originalnim delovima FPM „DELJANIN“

Pri radu sa sitnilicom obavezno koristiti stabilizatorske lance ili stabilizatorske poluge traktora.

3.1 Postupak priključivanja ROTO SITNILICE na traktor

Priključivanje roto sitnilice na traktor treba uvek obavljati na ravnoj podlozii to na sledeći način:

- Traktor treba poterati unazad tako da osa traktora zaklapa ugao od 90° u odnosu na osu sitnilice. Pomoću ručice hidraulika spusti donje traktorske poluge na visinu ose priključnih tačaka sitnilice.
- Ugasiti traktor
- Gornju traktorsku polugu – „top link“ pričvrstiti za gornju tačku priključnog nosača na rotacionoj sitnilici (sl. 4 pozicija A)



Slika . 4

- Prikačiti levu donju traktorsku polugu za levi rukavac roto sitnilice i u tom položaju osiguraj postojećim klinom slika (4. poz.B)
- Prikačiti desnu donju traktorsku polugu za desni rukavac roto sitnilice i u tom položaju osiguraj postojećim klinom slika (4. poz.C)
- Pričvrstiti prednji kraj kardanskog vratila (kraj vratila na kome se nalazi frikciona spojnica) na priključno vratilo roto sitnilice i osigurati ga u tom položaju (slika 4 poz.D)
- Spojiti drugi kraj kardanskog vratila za priključno vratilo traktora i osigurati ga u tom položaju.
- Sa sedišta traktora ručicom komande hidraulika u donjem položaju na kvadrantu , polako poterati traktor napred ili unazad dek se ne omogući pričvršćivanje prednjeg kraja gornje traktorske poluge (topling) za traktor i osigurati ga u tom položaju postojećim klinom.
- Kada je sitnilica priključena na traktor potrebno je da osovinu roto freze dovesti u horizontalni položaj produžavanjem ili skraćivanjem gornje traktorske poluge („top link“-a).

Napomena: redosled priključivanja roto sitnilice na traktor treba izvoditi uvek na isti način i to:

- a) Leva donja traktorska poluga
- b) Desna donja traktorska poluga
- c) Gornja poluga („top link“)

Kada se priključena sitnilica dovede u horizontalni položaj vrše se ostala podešavanja neophodna za normalno funkcionisanje.

- Pomoću ručice hidraulika pažljivo podići roto sitnilicu tako da ugao lomljenja kardanskog vratila ne bude suviše veliki . Kada se podigne sitnilica u najviši položaj proveriti sledeće:
 - a) Da li kardansko vratilo nije suviše razvučeno
 - b) Da li se kardansko vratilo slobodno okreće i da li zglobovi istog negde ne zapinju
 - c) Da li se zaštita kardana slobodno okreće
 - d) Izvršiti pričvršćivanje zaštite kardana lancem sa kardanskog vratila

Ovaj postupak ponoviti sa traktorom postavljenim tako da sitnilica visi u najnižem položaju.

To se može izvesti tako što se traktor sa priključenom sitnilicom natera na rampu tako da sitnilica visi u najnižem položaju a da pri tome njena najniža tačka bude znatno niža u odnosu na najnižu tačku traktora.



PAŽNJA: Maksimalni ugao lomljenja kardanskog vratila iznosi 30° . Ukoliko se ovaj ugao u toku rada prekorači može doći do ozbiljnih oštećenje rotacione sitnilice, oštećenja na kardanskom ili na priključnom vratilu traktora. Naročito obratiti pažnju da kardanski zglobovi nigde ne zapinju



PAŽNJA: nepoštovanje osnovnih zahteva za rad sa kardanskim vratilom ima za posledicu lom kardana ili oštećenje sitnilice



UPOZORENJE: Ukoloko kardansko vratilo u najnižem položaju sitnilice nepravilno radi , potrebno je skratiti podizne poluge traktora

- **Da bi se ograničilo njihanje roto sitnilice neophodno je podesiti donje traktorske poluge učvršćivanjem lancima tako da njihanja nema!!! .**

Rotaciona sitnilica je pravilno priključena na traktor ako su ispunjeni sledeći uslovi:

- Kada je osovina sitnilice dovedena u horizontalan položaj, noževi na rotoru treba da skoro dodiruju podlogu.
- kad je rastojanje između traktora i sitnilice najkraće elementi kardanskog vratila mogu do te mere da budu razvučeni da njegovi elementi ne ulaze potpuno jedan u drugi.
- Kad ie sitnilica podignuta u najviši ili pak najniži položaj, elementi kardanskog vratila ne smeju da ispadnu jedni iz drugih.
- Kad je sitnilica podignuta u najviši ili pak najniži položaj ne dolazi do međusobnog dodirivanja elemenata zglobova.
- Ako je sitnilica dovedena u vodoravni položaj.(ovo podešavanje vršiti podešavanjem donjih traktorskih poluga)

3.2 Otkaçivanje ROTO SITNILICE sa traktora

Nakon završetka rada sitnilicu polako spustiti na tlo i nakon toga vršiti otkaçivanje sledećim redosledom:

- Iz traktorske kabine otkaçiti kraj gornje traktorske poluge („top link“) sa traktora. Da bi se lakše izvukla osovinica „top link“-a potrebno je lagano pomerati traktor napred nazad.
- Skinuti prednji zglob kardanskog vratila sa priključnog vratila traktora (slika 4. poz.E)
- Otkaçiti donju desnu traktorsku polugu, pri čemu se može upotrebiti ručica za izravnavanje na traktoru radi olakšanja postupka otkaçivanja ove poluge (slika 4. poz.C)
- Otkaçiti donju levu traktorsku polugu (slika 4. poz. B)

4.0 RAD SA ROTO SITNILICOM

4.1 Transportni položaj roto sitnilice

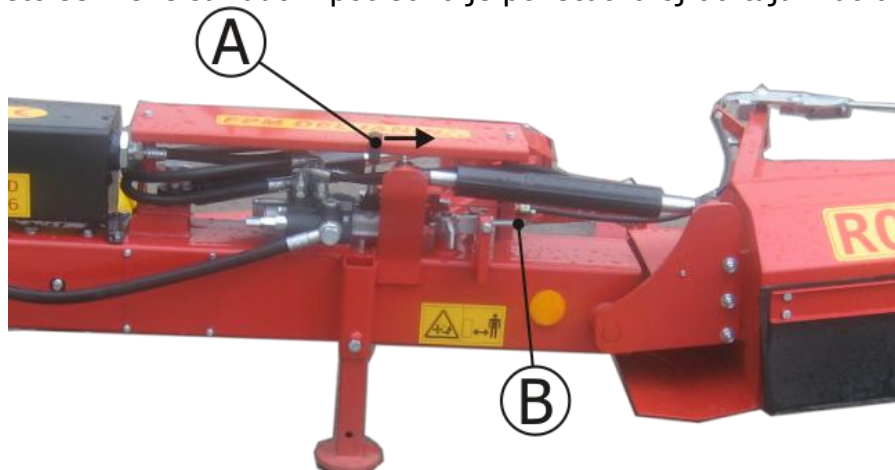
Pre nego što se krene na obradu zemljišta roto sitnilicu treba podesiti u transportni položaj. Ovo podešavanje izvršiti na ravnom terenu pre polaska. Kad je roto sitnilica pravilno priključena na traktor ona je spremna za rad. Da bi je pustili u pogon potrebno je izvršiti podešavanje radne dubine za prvi prohod. Ovo podešavanje se vrši tako što se podignu ili spuste papuče („skije“) na potrebnu visinu, prema strukturi zemljišta koje se obrađuje.

„Pipalicu“ desnom rukom povući dok sitnilica ne dođe u levi položaj do kraja. Kada je sitnilica podignuta u maksimalni položaj, levom rukom aktivirati blokadu za transport. Ručicu ventila pomeriti u levu stranu i podići ugao glave sitnilice do maksimuma. Kada je sitnilica zauzela maksimalni ugao ručicu ventila vratiti u prvobitni položaj. Ovako podešena sitnilica spremna je za transport

4.2 Puštanje u rad roto sitnilice

Pustiti motor traktora u rad i ručicom hidraulika podići sitnilicu sa zemlje, uključiti priključno vratilo traktora da se rotor okreće izvesno vreme sa malim brojem obrtaja da bi došlo do razbacivanja ulja u kućištu reduktora. Sa zadnje strane roto sitnilice ručicu ventila (slika 5.poz A) pomeriti u desno u pravcu strelice i spustiti glavu sitnilice. Desnom rukom zategnuti pipalicu i levom rukom otkaçiti blokadu (slika 5.poz B) koja služi za transportni položaj. Sitnilica je spremna za rad.

Pre nego što se krene sa radom potrebno je povećati broj obrtaja vratila na 500 o/min.



Slika 5. Ručica ventila i blokada

4.3 Podešavanje „Pipalice“

Roto sitnilica FPM „DELJANIN“ je naročito pogodna za obradu voćnjaka i starijih vinograda gde sitnilica vrši obradu zemljišta do same sadnice. Kod mlađeg zasada voćnjaka gde su stabla tanka i slaba a da prilikom obrade ne bi došlo do oštećenje istih potrebno je podesiti osetljivost pipalice skraćivanjem ili otpuštanjem sajle preko zavrtnja označenog na slici 6 poz. A). Sitnilica je spremna za rad.



Slika 6. Pipalica

4.4 Postavljanje i rad sa ručnom komandom pipalice

Postoji i mogućnost ručnog upravljanje pipalicom kao dopunska opcija, koja se postavlja u kabinu na krilo traktora sa desne strane rukovaoca kao što je prikazano na slici broj 7. Operater prilikom rada ručnim putem vrši pomeranje sitnilice levo i desno povlačenjem ručice napred i nazad.



Slika 7. Ručna komanda pipalice

5.0 ODRŽAVANJE ROTO SITNILICE



PAŽNJA: Pohabane i oštećene delove roto sitnilice obavezno zameniti sa originalnim delovima FPM „DELJANIN“ jer se time obezbeđuje visok kvalitet i laka zamena delova.

5.1 Zamena noževa

Noževi sitnilice su izrađeni od visoko kvalitetnog čelika otpornog na habanje što im obezbeđuje dug vek trajanja u uslovima pod kojima treba da rade a to su:

- Brzina rada u granicama od 06-1,0 m/s
- Rad bez preopterećenja traktora, udara i vibracija
- Brzina okretanja rotora sa noževima do 500 o/min

Pri zameni prvo identifikovati koji su levi a koji desni noževi zatim ih pomoću zavrtnejeva pričvrstiti na njihove nosače. Svaka sekcija ima na sebi 3 leva i 3 desna noža.

Raspored noževa na rotoru je u obliku spirale kao što je prikazano na slici 8, tako da svojim oblikom i veličinom utiču na otpor i jednoličnost obrade zemljišta po širini i dubini.



Slika 8. Raspored noževa na rotoru

5.2 Zamena ulja u reduktoru i hidrauličkom sistemu

Zamenu ulja je najbolje obaviti posle završenog rada sa sitnilicom jer je ulje još toplo a talog u reduktoru se još nije slegao.

Prvo odvrni čep (slika 9 i 10 poz. A) koji služi za sipanje i ispuštanje ulja čime je omogućeno isticanje ulja iz kućišta reduktora. U kućište reduktora je potrebno naliti 0,8 lit. ulja SAE 90.

Punjenje rezervoara hidrauličkog sistema vršiti otvaranjem čepa kako je prikazano na slici 10 poz.B. U kućište hidrauličkog sistema sipati 8 lit. ulja HD 46.



Slika 9. reduktor



Slika 10 Rezervoar hidrauličkog sistema

Zamenu ulja u kardanu vršiti posle svakih 500h rada ili jednom godišnje. Ulje u hidrauličkom sistemu povremeno proveravati i dodavati prema potrebi.

5.3 Podmazivanje

Redovnim podmazivanjem osigurava se ekonomičan rad bez kvarova i nepotrebnih zastoja. Tekalemit pumpom napunjenom mašću za podmazivanje podmazati sve osovinske sklopove. (Na sitnilici ima 11 mazajućih mesta)

6.0 MOGUĆI ZASTOJI

Pri pravilnom korišćenju roto sitnilice nema zastoja sem u slučaju loma reduktora, loma kardana ili pucanja hidrauličkih creva, krivljenja ili loma noževa sitnilice. Zato je neophodno pregledati i očistiti teren pre rada.



PAŽNJA: PRE NEGO ŠTO SE OTPOČNE SA OBRADOM ZEMLJIŠTA, UKLONITI SA NJIVE KAMENJE I SKRIVENE PREPREKE

7.0 SPECIFIKACIJA REZERVNIH DELOVA ROTO SITNILICE

1. Reduktor sa hidrauličnom pumpom
2. Hidraulički cilindar (veći)
3. Hidraulički cilindar za pomeranje glave sitnilice
4. Hidraulički ventil
5. Hidraulička creva
6. Mehanizam pipalice

8.0 GARANTNA IZJAVA:

Svi uređaji proveravaju se tehnički i bezbednosno tokom svakog koraka proizvodnog procesa. Uprkos tome, može da dođe do nepravilnog rada uređaja. Zbog toga se dobro upoznajte sa garantnim uslovima:

1. Garantujemo da će proizvod funkcionisati besprekorno i da ćemo odstraniti sve nedostatke i kvarove na proizvodu koji su posledica isključivo fabričkih grešaka i koji su nastali u garantnom roku, pri normalnoj upotrebi proizvoda i poštovanju svih tehničkih uputstava.
2. Garantni rok traje 24 meseca, a počinje da teče danom kupovine uređaja što se dokazuje originalnim i čitljivim fiskalnim računom. Garancija je važeća samo uz podnošenje uredno i potpuno ispunjenog i overenog, na dan kupovine, garantnog lista od strane prodavca. Nečitljivi i izbledeo fiskalni račun neće se priznavati.
3. Popravke, reklamacije u garantnom roku obezbeđuje proizvođač, preko ovlašćenog distributera.
4. da ćemo na vaš zahtev sve kvarove i nedostate popraviti ili odstraniti, ako to saopštite u garantnom roku. Kvar ćemo besplatno popraviti najkasnije u roku 45 dana od dana prijave kvara. Mašinu koju ne popravimo u roku 45 dana, na vaš zahtev, zamenićemo je sa novom. Za vreme popravljanja produzićemo vam garantni rok.
5. Garancija važi od dana prodaje na malo što se dokazuje potvrđenim garantnim listom i računom. Nečitljivi i izbledeo fiskalni račun neće se priznavati.

Garancija ne obuhvata sledeće slučajeve:

1. ako se neprimenjuju uputstva
2. ako koristite neodgovarajući kardan
3. zbog nemarnog rukovanja sa mašinom, preopterećenja koja prouzrokuju lomljenje svih opružnih krakova, gumenih lopatica
4. zbog svih radova na mašini koje obavi neovlašćeno lice, od mehaničkih udaraca, zbog krivice kupca ili trećeg lica.
5. zbog oštete od poplava, požara, udara groma

U slučaju kvara saopštite pismom ili telefonom nama ili našem ovlašćenom distributeru:

1. naziv, tip i fabrički broj mašine
2. opis kvara
3. tačnu adresu

Vreme obezbeđivanja servisiranja:

Je vreme u kojem garantujemo servis, pribor i rezervne delove a počinje da važi od dana nabavke mašine, i traje **10 godina**.

U **Kuršumliji**, 13.05.2014. godine.

Direktor : Nenad Deljanin

GARANTNI LIST

NAZIV PROIZVODA:		TIP PROIZVODA		SERIJSKI BROJ:	
ROTO SITNILICA		ROT 700			
GODINA PROIZVODNJE		POTPIS KONTROLE:			
DATUM PRODAJE					
Dan		Mesec (slovima):		Godina:	
_____		_____		_____	
Podaci o kupcu:					
Ime kupca:		_____			
Mesto:		_____			
Adresa:		_____			

m.p

Prodavac:

.....



FPM DELJANIN

18430 Kuršumlja, Toplička 121 - SRBIJA
tel:+381 27 382 401; +381 27 380 401

— ROT 700

ROTARY TILLER



GB

Instruction for work and maintenance

CE



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1.0 DECLARATION OF CONFORMITY

This device is manufactured in accordance with European standards on product safety and the Regulations on Machinery Safety (*"Sl. glasnik RS", br. 13/2010*)

DECLARATION OF CONFORMITY

Issue: 01-2014

Manufacturer:	FPM "DELJANIN" 18430 Kursumlija, Toplicka 121	
Product name:	ROTARY TILLER	
Model/type:	ROT-700	
FPM "DELJANIN" declares that the Product named above complies with the requirements of Annex I Machinery directive 2006/42EC and that the product is constructed and designed in accordance with the referenced harmonized standards.		
The product was a subject of conformity assessment procedure described in Annex VIII Machine Directive 2006/42 EC		
Harmonized standards:	<ul style="list-style-type: none"> - EN ISO 4254-1:2013 Agricultural machinery - Safety - Part 1: General requirements - EN ISO 4254-5: 2008 Agricultural machinery - Safety - Part 5: Power-driven soil-working machines - ISO 3744:2010 Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane - EN ISO 11201:2010 Acoustics - Noise emitted by machinery and equipment - Determination of emission sound pressure levels at a work station and at other specified positions in an essentially free field over a reflecting plane with negligible environmental corrections - EN ISO 13849-1:2008 Safety of machinery-Safety –related parts of control systems- Part 1: General requirements for designed - EN ISO 13849-2:2008 Safety of machinery-Safety –related parts of control systems- Part 1: Validation - EN ISO 12100:2010 Safety of machinery-General principles for design - Risk assessment and risk reduction - ISO/TR 14121-2:2012 Safety of machinery — Risk assesment Practical guidance and examples of metods - ISO 3864-1:2011 Graphical symbols - Safety colours and safety signs - Part 1: Design principles for safety signs and safety markings - ISO 3864-2:2004 Graphical symbols - Safety colours and safety signs - Part 2: Design principles for product safety labels 	
FPM DELJANIN declares that the products named above have been designed to comply with the essential health and safety requirements relating to the design and construction of machinery of Annex I Machine Directive 2006/42EC and referenced harmonized standards. Signed by:		
Issue: 18430 Kursumlija , 1/2014-05-13 Name: Nenad Deljanin Position: director		

2.0 GENERAL

2.1 The instructions purpose

The purpose of this guide is to enable the proper implementation of the machine, successful operation and maintenance work. A careful study of this manual will provide you with useful information for the preparation of the equipment, as well as for the work with it.

The great variety of working conditions in practice does not allow it to be covered by these guidelines, but all essential elements of the machine settings are clearly set out.

2.2. SAFETY MEASURES

2.2.1 General



Before starting any work with the rotary tiller it is necessary that the operator reads the operator's manual for operation and maintenance and to comply with the above warning and thus protect himself and others from injury. In this way, he will also provide a reliable operation of tools.



**ATTENTION !
FOR YOUR SAFETY**

Careful study of this manual



This symbol with a warning statement means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows. Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause injury or death. It is essential that you read the instructions and safety regulations before you attempt to assemble or use this unit.

The following warning terms are used with the symbol of danger:

DANGER – This word indicates a hazardous situation which, if not avoided, could cause serious injury or death. Safety signs containing the word "DANGER" should be used only rarely, and for those situations that are a major threat.

WARNING – This word indicates a potentially hazardous situation which, if not avoided, could result in serious injury or death. Dangers marked with the word "WARNING" represent a lower level of risk than those marked with the word "DANGER".

ATTENTION – This word indicates a potentially hazardous situation which, if not avoided, may result in minor or medium injury. The word "ATTENTION" can also be used to warn of the actions in some operations that may lead to injury.

2.2.2 General instructions for safe working

- A rotary tiller should not be operated by any individual who did not read the entire instruction manual and understood all the notes.
- Check whether the safeguards on the PTO drive shaft, cardan shaft of the tractor, cardan shaft of the tiller, and the reductor are properly positioned and well secured.
- The use of adequate lockpins on the sleeve of the cardan shaft is mandatory when such sleeves are positioned on the jagged drive shaft of the tractor and the machine, in order to avoid injuries.
- Never come close to the cardan shaft and the implement when in operation.

- After the aggregation, turn the tractor engine down before starting any adjustments or examinations on this implement.
- Always check whether all the blades are accounted for.
- Always check whether all the screws holding the hoes on the mounting and the working disk have been properly secured.
- Check whether all the screws holding the blades on the flange of the working axle have been properly tightened.
- Prior to every use of the tiller, make all the necessary adjustments in accordance with the condition of the crops being cultivated:
 - The angle in which the machine is positioned in comparison with the horizontal line of the land in the direction that is perpendicular - to the tractor axis and the angle in which the machine is positioned in comparison with the land in the direction of the tractor's axis.
- Only after performing all the adjustments and examinations, can the tractor engine then be started, but, before starting the engine, once again check whether the bar for the engaging of the cardan shaft has been turned off.
- It is very important to always first lift the machine off the ground and only then start the cardan shaft drive.
- While the machine is working, no one is allowed to sit or stand on the machine or the bars of the tractor.
- After the work is finished, one should first disengage the machine by means of an adequate handle, and then lower the machine.
- When the rotary tiller is left unsupervised, it has to be lowered onto the ground, the tractor engine has to be disengaged and the ignition key has to be taken out.
- When the machine is being separated from the tractor, make sure that the machine is placed in a stable position while lying on the ground.

2.2.3. Warning decals for safe work on the machine

On the carrying construction of the machine, warning decals for safe work have been positioned in the form of stickers with illustrations of potential hazards which could not have been avoided by means of structural solutions. The meaning of the decals is explained below.

Carefully read the wording of the decals and maintain the decals in good condition. If the decals are not visible, are damaged or have fallen off, they should be replaced with new ones. Spare decals may be purchased from the machine distributor or maintenance representative. The existing hazards are marked with a warning triangle, whereas the notices on avoidance of injuries are shown by illustrations.

These are the signs:



Read carefully operating manual and take it into consideration.



Shut off engine and remove key before performing maintenance or repair work.



Do not drive on the hitch and the machine - It is strictly forbidden to drive on the hitch and the machine because it may result in serious injury



Maintain a safe distance from the machine during operation - Be sure to keep a safe distance from the chopper, especially of rotating blades that can cause foot injury.



Do not open or remove a shield while working tool - otherwise it may result in serious injury.



Stay clear while engine is running.



Rotating elements-beware hands



After a couple of hours of work control if the screw, nuts and washers are tightened enough.

2.3 The description of the rotary tiller

The rotary tiller manufactured by FPM "DELJANIN" is a cultivation implement with active cutting tools - hoes with horizontal axis of rotation powered by the PTO drive shaft on the tractor. It is a carried implement and is connected to the 1stand 2ndcategory tractors that have a three-point linkage.

The rotary tiller is suitable for:

- Work both in lowland and highland areas high
- Quality preparation of the soil for the seeding
- Cultivation of the soil between the rows in vineyards and orchards all year long
- Mixing of mineral fertiliser and plant residues with the soil, as well as the maintenance of the structure of land and the increase of fertility of land.

The tiller consists of three main subassemblies (modules):

- Connecting frame
- Transmission module that provides maximal power utilisation through a PTO drive shaft of the tractor.
- Working module - rotor of the tiller with cutting blades that - thanks to their shape, geometry, and position - enable high quality cultivation of land under all conditions and in all working modes with minimal consumption of energy.

2.3.1 Connecting frame of the rotary tiller

The connecting assembly is used for connecting the tiller to the tractor, adjusting of the working position, and carrying of working elements. Connecting points are located on the connecting frame and they enable the connecting onto the 1stand 2ndcategory tractors without any additional equipment. The implement is hoist into the transport and working position by means of a hydraulic control handle of the tractor.



Picture 1. Connecting frame

2.3.2 Transmision modul



Picture 2. Transmision modul

2.3.3 Work modul



Picture 3. Work modul rotary tiller

2.4 TECHNICAL DATA

Type	.....	ROTARY TILLER-ROT 700
Length	.....	900 mm
Width	.....	2200 mm
Height	.....	800 mm
Working width	.....	700 mm
Transmission	.....	Mechanical
Central transmitter	.....	Gear
Regulation of the depth of tillage	.....	The mechanical sliding supports (slippers or "skis")
operating depth	.....	Work 0,15m, max 0,2 m from two passages
Type of rotor	.....	With a horizontal rotation axis
The cutting apparatus	.....	Rotating with a growl effect, the optimal shape, geometry and layouts for various terms and conditions of land
Type of connection	.....	Carried by a variant of the three-point
RPM of rotor	.....	540 o/min
Mass	.....	250 kg


2.5 IDENTIFICATION OF THE MACHINE

The machine may be identified by a name plate located on the left side of rotary tiller on hydraulic system oil tank..

The plate contains the following data:

- The name and the address of the manufacturer;
- The actual name of the machine in the field "Machine name";
- The commercial designation of the product is given in the field "type";
- The number of the machine is given in the field "serial number";
- The mass of the machine is given in the field "Mass", given in (kg).

When ordering the spare parts and seeking explanations, one should make sure to mention the type of the machine and its serial number.

FPM "DELJANIN" 18430 Kursumlija Toplicka 121, www.fpmdeljanin.com 	
Machine name:	Rotary tiller
Type	ROT 700
Serial number:	
The year of manufacturing:	
Mass :	250 kg

3.0 HANDLING A ROTARY TILLER

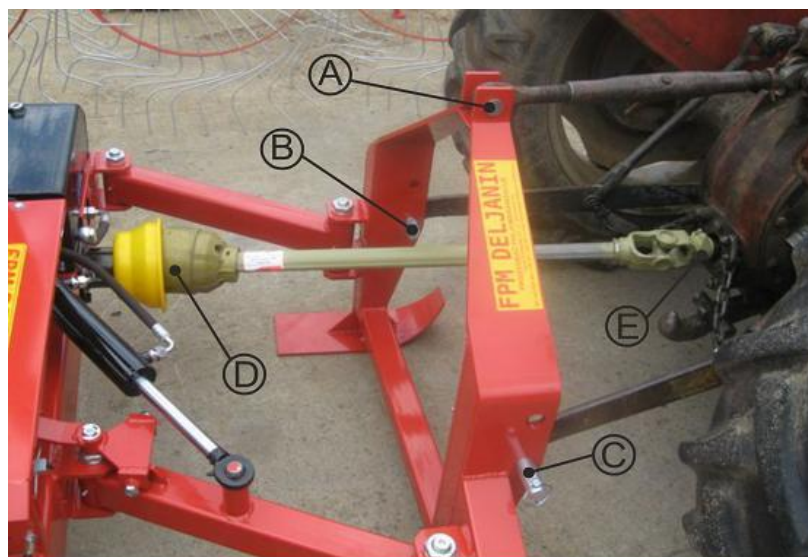
Prior to use, one should check whether all the parts (nuts, screws, and alike) are tight, paying special attention to the tightness of the blades on the rotor. Worn parts and damaged blades should be replaced by new original parts immediately.

While working with the tiller, always use the stabilisation chains or stabilisation bars of the tractor.

3.1 The procedure for hooking the ROTARY TILLER onto the tractor

The rotary tiller should always be hooked onto the tractor on a flat surface, in the following manner:

- The tractor has to be moved backwards until the tractor's axis is vertical to the axis of the tiller. Use the hydraulic handle to lower the lower top links to the height of the axis of the tiller's linkage points.
- Disengage the tractor
- Connect the upper top link to the upper linkage point on the rotary tiller (picture 4 position A)



Picture . 4

- Connect the lower left top link to the left sleeve of the rotary tiller and secure it in this position by using the existing lock (picture 4, position B)
- Connect the lower right top link to the right sleeve of the rotary tiller and secure it in this position by using the existing lock (picture 4, position C)
- Connect the front end of the cardan shaft (the one where the frictional clutch is located) to the PTO drive shaft of the rotary tiller and secure it in this position (picture 4, position D)
- Connect the other end of the cardan shaft to the PTO drive shaft on the tractor and secure it in this position.
- From the driver's seat, use the hydraulic control handle in the lower position in the quadrant to slowly move the tractor to the front or to the back until it is possible to connect the front end of the upper top link to the tractor and secure it in this position.
- When the tiller is connected to the tractor, the axle of the rotary tiller has to be brought to a horizontal position by extending or shortening the upper top link.

Note: the connecting of the rotary tiller to the tractor always has to be performed in the following sequence:

- a) Lower left top link
- b) Lower right top link
- c) Upper top link

When the connected tiller is brought to a horizontal position, other adjustments are made as required for normal functioning of the tiller.

➤ Use the hydraulic handle to carefully lift the rotary tiller so that the angle of breaking of the cardan shaft is not too large. When the tiller is brought to the highest position, check the following:

- a) That the cardan shaft is not stretched too much
- b) That the cardan shaft is moving freely and that the joints are not touching anything
- c) That the cardan protection sleeve is moving freely
- d) That the cardan protection sleeve is tied to the cardan shaft with a chain

Repeat this procedure with the tractor positioned in such a way that the tiller is hanging in the highest position. This can be done by moving the tractor together with the tiller onto the ramp so that the tiller is hanging in the lowest position, but also that the lowest point of the tiller is significantly lower than the lowest point of the tractor.



ATTENTION: Maximal angle of cardan shaft breaking is 30°. If this angle is exceeded while working, this may lead to serious damage of the rotary tiller, damage of the cardan or PTO drive shaft on the tractor. One should especially pay attention that the cardan joints are not brushing against anything



ATTENTION: Failure to adhere to the basic requirements of the work with cardan shaft may result in the breakage of the cardan or damage to the tiller



WARNING: If the cardan shaft is malfunctioning in the lowest position of the tiller, the links on the tractor used for lifting have to be shortened

➤ **In order to limit the swinging of the rotary tiller, lower top links have to be adjusted by tightening the chains so that there is no swinging on the top links!!! .**

Rotary tiller has been properly attached to the tractor if the following conditions are met:

- When the tiller axle is brought into a horizontal position, the blades on the rotor have to nearly touch the ground.
- When the distance between the tractor and the tiller is the shortest, the elements of the cardan shaft may be elongated to such an extent so that its elements are not entirely in contact with each other.
- When the tiller is in its highest or lowest position, the elements of the cardan shaft must not fall out from one another.
- When the tiller is in its highest or lowest position, the elements of the joint are not touching each other.
- If the tiller is in a horizontal position (this should be adjusted by adjusting the lower top link)

3.2 Unhooking the ROTARY TILLER from the tractor

After finishing working with the tiller, lower the tiller slowly onto the ground and unhook the tiller in the following sequence:

- From the tractor cab, unhook the upper top link from the tractor. In order to take the top link pin out more easily, slightly move the tractor back and forth.
- Remove the upper joint of the cardan shaft from the PTO drive shaft of the tractor (picture 4, position E)
- Unhook the lower right top link, and to make the unhooking easier, one may use the tractor levelling handle (picture 4, position C)
- Unhook the lower left top link (picture 4, position B).

4.0 WORKING WITH THE ROTARY TILLER

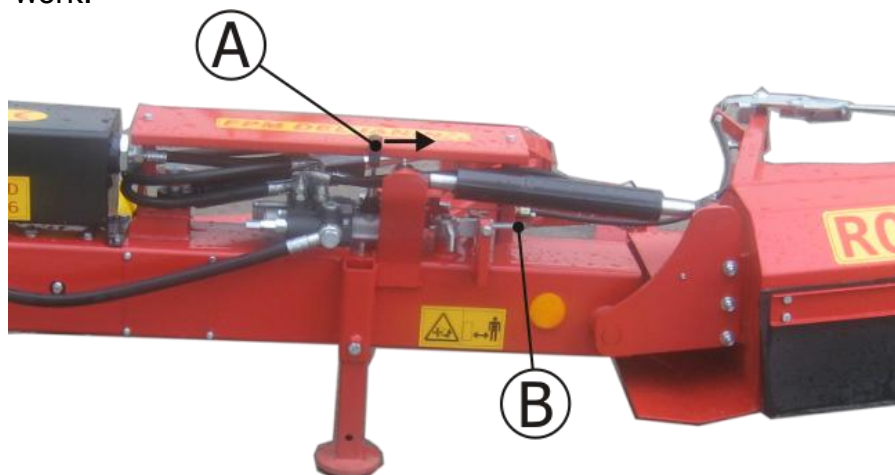
4.1 Transport position of the rotary tiller

Before starting with the cultivation of land, the rotary tiller has to be adjusted to the transport position. This adjustment is performed on flat terrain prior to coming out to the field. When the rotary tiller is properly connected to the tractor, it is ready for work. In order to engage the tiller, one needs to adjust the working depth for the first passage. This is adjusted by lifting or lowering the slipper to the required height, depending on the structure of the soil being cultivated.

Pull the offset tiller with the right hand until the tiller reaches the full left position. When the tiller is in the highest position, use the left hand to activate the transport ratchet. Move the valve handle to the left and increase the angle of the tiller head to the maximum. When the tiller is in the position with maximal angle, move the valve handle into the original position. The tiller prepared in this way is ready for transport.

4.2 Commissioning of the rotary tiller

Start the engine and use the hydraulic handle to lift the tiller from the ground, engage the PTO drive shaft on the tractor to start the rotation of the rotor for a short period of time with a small number of rotations so that the oil would spread over the reductor housing. On the back side of the rotary tiller, shift the valve handle (picture 5, position A) to the right in the direction of the arrow and lower the tiller head. Use the right hand to tighten the offset tiller and the left hand to unhook the ratchet (picture 5, position B) used for transport position. The tiller is ready for work.

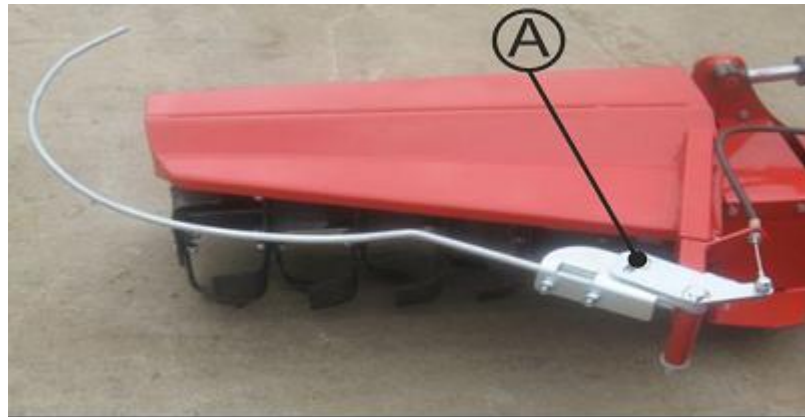


Slika 5. Ručica ventila i blokada

4.3 Adjusting of the “wire spring”

The rotary tiller manufactured by FPM “DELJANIN” is in particular suitable for use in orchards and older vineyards where the tiller is used for tillage until the planting. In order to avoid damage to younger orchards with thick and weak trunks while tilling, one should adjust the sensitivity of the wire spring by shortening or extending the cable using the screw bolt shown on picture 6, position A. The tiller is ready for work.

Before commencing work, one should increase the number of rotations of the shaft to 500 r/min..



Picture 6. “Wire spring”

4.4 Positioning and working with the manual control of the “wire spring”

There is an additional option for manual control of the wire spring, where the controls are placed inside the cab on the lateral side of the tractor to driver’s right, as shown in picture 7. While using the manual controls, the operator moves the tiller to the left and to the right by pulling the handle to the front and to the back.



Picture 7. Manual control of the wire spring

5.0 MAINTENANCE OF THE ROTARY TILLER



PAŽNJA: Pohabane i oštećene delove roto sitnilice obavezno zameniti sa originalnim delovima FPM „DELJANIN“ jer se time obezbeđuje visok kvalitet i laka zamena delova.

5.1 Replacement of blades

The blades for the tiller are made of high quality steel resistant to wear which ensures long service life under the prescribed conditions, which are as follows:

- Speed of work should range from 0.6 to 1.0 m/s
- Working without overloading the tractor, shocks and vibrations
- The rotation speed of the rotor with blades should be up to 500 r/min

While performing the replacement, one should first identify the left and the right blades and then use the screw bolts to position the blades onto the mounting. Each section has 3 left and 3 right blades.

The blades are placed onto the rotary element in a spiral formation as shown on picture 8, so as to affect the resistance and uniformity of soil cultivation in terms of width and depth with its shape and size.



Slika 8. Raspored noževa na rotoru

5.2 Changing of oil in the reductor and the hydraulic system

It is best to change the oil after finishing the work with the tiller because the oil is still warm and the residues in the reductor have not yet settled.

First, unscrew the bunk (pictures 9 and 10, position A) used for pouring in and releasing of oil which allows for the oil to pour out from the reductor housing. Pour 0.8 l of oil into the reductor's housing SAE 90.

The tanks on the hydraulic system are filled by opening the bunk as shown in picture 10, position B. Pour 0.8 l of HD 46 oil into the housing of the hydraulic system.



Picture 9. Reductor



Picture 10 hydraulic system oil tank

Replace the oil in the driveshaft on every 500 hectare covered or once a year. The level of oil in the hydraulic system has to be checked from time to time and oil should be added when necessary.

5.3 Lubrication

Regular lubrication ensures efficient working without any brake-downs and unnecessary standstills. Use a Tecalet grease gun to lubricate all the axial assemblies (the tiller has 11 grease nipples)

6.0 POTENTIAL STANDSTILLS

If the rotary tiller is use properly, there should be no standstills except in the event of breaking of the reductor, breaking of the driveshaft or bursting of hydraulic hoses, bending or breaking of tiller blades. That is the reason why it is essential to inspect and clear the terrain prior to commencement of work.



PAŽNJA: PRE NEGO ŠTO SE OTPOČNE SA OBRADOM ZEMLJIŠTA, UKLONITI SA NJIVE KAMENJE I SKRIVENE PREPREKE

7.0 SPECIFICATION OF SPARE PARTS FOR THE ROTARY TILLER

1. Reductor with a hydraulic pump;
2. Hydraulic cylinder (larger);
3. Hydraulic cylinder for tiller head moving;
4. Hydraulic valve;
5. Hydraulic hoses;
6. Wire spring mechanism.

8.0 WARRANTY STATEMENT:

All the devices are being checked for technical and safety issues during each stage of the manufacturing process. In spite of that, malfunctions may occur. That is the reason why you should become familiar with these warranty conditions:

1. We hereby warrant that the product shall work impeccably and that we will deal with all the shortcomings and malfunctions of the product which occur only as a consequence of an error made in the factory and within the warranty period, subject to normal use of the product and adherence of all the technical instructions.
2. The warranty period lasts for 24 months, and starts with the date of purchase of the machine which is proven by an original and clearly visible fiscal receipt. The warranty is valid only if a properly filled and stamped warranty issued by the seller on the date of purchase is presented. A fiscal receipt that is hard to read and which has faded away shall not be accepted.
3. Repairs and shortcomings claims within the warranty period shall be dealt with by the manufacturer through the authorised distributor.
4. We will act on your request and repair or remove all the malfunctions and shortcomings if we are requested to do so within the warranty period. Any malfunction will be repaired free of charge within 45 days from the receipt of the notice on malfunction. Any machine not repaired within 45 days shall be replaced by a new one at your request. We will extend the warranty period for the period during which your machine was being repaired.
5. The warranty is valid from the date of purchase proven by a valid warranty and a receipt. A fiscal receipt that is hard to read and which has faded away shall not be accepted.

The warranty does not cover the following events:

1. When instructions are not observed
2. When the cardan shaft being used is not adequate
3. When the machine is improperly handled, overloaded, which leads to breakage of all the elastic arms, rubber bucket
4. When the machine was repaired by an unauthorised individual, after a mechanical shock, occurring due to the fault of the buyer or third party.
5. When the machine was damaged during a flood, fire, lighting strike

In the event of a malfunction, inform our service centre about your following, either by letter or phone:

1. Name, type, and factory number of the machine
2. Description of the malfunction
3. Correct address

The period during which the service is provided:

Is the period during which we guarantee the service, tools, and spare parts, and this period starts with the date of purchase and lasts for **10 years**.

In **Kuršumlja**, 13.05.2014. year.

Director : Nenad Deljanin

WARRANTY CERTIFICATE

PRODUCT NAME:		PRODUCT TYPE		SERIAL NUMBER:	
ROTARY TILLER		ROT-700			
YEAR OF manufacturing		Controler's signature:			
DATE OF DELIVERY					
DAY		MONTH (IN WORDS):		YEAR:	
_____		_____		_____	
BUYER DATA:					
BUYER'S NAME:		_____			
PLACE:		_____			
ADDRESS:		_____			

stamp

SALESMAN:

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