MORNINGTON PENINSULA Shire

ADDENDUM AGENDA

COUNCIL MEETING

TUESDAY, 25 MARCH 2025

6:30PM

MUNICIPAL OFFICES
BESGROVE STREET, ROSEBUD

TABLE OF CONTENTS

4 MANAGEMENT REPORTS

PLANNING & ENVIRONMENT

4.6 Future beach cleaning

Prepared By	Manager - Climate Change and Sustainability
Authorised By	Acting Director - Planning & Environment
Document ID	A13630522
Briefing Note Number	
Attachment(s)	1. Beach Cleaning Recommendations Report ⇩ 2. Monitoring - Hand Beach Cleaning Trial Monitoring Summary ⇩ 3. Monitoring - Beach Cleaning Trial Monitoring Methods ⇩ 4. Options - Beach Cleaning Options Assessment ⇩ 5. Options - Beach Cleaning Options Maps ⇩ 6. Options - Hybrid 80 Hand 20 Rake Values Analysis ⇩ 7. Options - Hybrid 70 Hand 30 Rake Values Analysis ⇩ 8. Memo - Beach Cleaning Recommendations Report (Additional Information) (confidential) 9. Technologies - Mechanical Beach Cleaning Technologies Review (confidential) 10. Technologies - Surf Rake Brochure ⇩ 11. Technologies - Surf Rake Manual ⇩ 12. Technologies - BeachTech Overview ⇩ 13. Technologies - BT 1500 Specifications ⇩ 14. Technologies - BT 2000 Specifications ⇩ 15. Technologies - Clean Coast Solutions Introduction ⇩

EXECUTIVE SUMMARY

This report presents the following five future beach cleaning methodology options for our Port Phillip Bay beaches:

1. 100% hand cleaning (same as current trial)
2. 100% mechanical raking (only services 80% of beaches, no cleaning of remaining 20%)
3. Hybrid – 80% hand cleaning and 20% mechanical raking
4. Hybrid – 70% hand cleaning and 30% mechanical raking (recommended)
5. Hybrid – 20% hand cleaning and 80% mechanical raking (same as pre-trial)

Percentages are based on the 32.5km length of serviced Port Phillip Bay beaches and have been rounded for naming purposes.

Each option has been indicatively priced for in-house or outsourced delivery models for Council's consideration. Additionally, the data collected throughout the hand beach cleaning trial from July 2024 to February 2025 is presented in Attachment 2.

Attachment 1 - Beach Cleaning Recommendations Report, outlines the basis of this recommendation.

Option 4 Hybrid – 70% hand cleaning and 30% mechanical raking is recommended. This option has been determined on localised beach accessibility, recreational values, visitation rates, coastal setting, community sentiment and litter volumes collected throughout the first seven months of the hand cleaning trial. Details are provided in Attachments 4, 5 and 7.

An outsourced delivery model of Option 4 Hybrid – 70% hand cleaning and 30% mechanical raking is recommended as indicative pricing of outsourced delivery is more economical than internal delivery, as detailed in Confidential Attachment 8.

RECOMMENDATION

That Council:

1. **Adopts the recommended future beach cleaning model of: Hybrid – 70% hand cleaning and 30% mechanical raking with an outsourced delivery model.**

2. **The Council's adopted methodology for beach cleaning will be actioned from the date of Council's decision in accordance with Council's contractual obligations, effective up to 30 June 2028.**

Part B

That Council resolves that Attachment 8, 9 to this report be retained as confidential items pursuant to section 3 (1) g (ii) of the Local Government Act 2020 as they contain commercial in confidence information and if released, would unreasonably expose the business, commercial or financial undertaking to disadvantage.

COUNCIL & WELLBEING PLAN

This aligns with the Council and Wellbeing Plan, in particular:

Theme 1: A healthy natural environment and well-planned townships.

- Strategic Objective 1.2: A healthy ecosystem, in which our coastline, bushland, wildlife and green wedge is resilient to the climate emergency and development.

GOVERNANCE PRINCIPLES

Section 9 of the *Local Government Act 2020* states that a Council must in the performance of its role give effect to the overarching governance principles. This report aligns with principles B, C and E which are:

B. Priority is to be given to achieving the best outcomes for the municipal community, including future generations.

C. The economic, social and environmental sustainability of the municipal district, including mitigation and planning for climate change risks, is to be promoted.

E. Innovation and continuous improvement is to be pursued;

RELEVANT COUNCIL DECISIONS AND POLICIES

Relevant Council decisions and engagement:

- 18 October 2022 – NOM 370

  'That Council agrees in principle for a hand beach cleaning program on Mornington Peninsula Shire beaches and that the Chief Executive Officer brings back to Council a recommendation on whether implementation should go ahead based on cost, efficiency, community benefit and consideration of the role of volunteers.'

- 30 May 2023 – NOM 401

  'That Council policy emphasise an environmentally friendly outcome for cleaning of Council controlled beaches and take notice of Climate Crisis issues involved in some beach cleaning methodology.'

- 21 November 2023 Council briefing - Update and context for future maintenance contracts

- 13 February 2024 Council briefing - Beach Cleaning Review & Proposed Future Cleaning Program

- 5 March 2024 – Council report and decision

  'That Council supports a 12-month trial beach cleaning program of Option 4 of 100% hand cleaned beaches. This option recognises the environmental values of the coastline as our top priority.'

- 18 December 2024 Urgent Business – Hand Beach Cleaning

- 28 January 2025 Council report – Urgent Business

  Response withdrawn.

- 4 February 2025 – Councillor workshop

Preferred options to be further investigated and brought back to Council for consideration.

DISCUSSION

Purpose

The purpose of this report is to present five beach cleaning options for our Port Phillip Bay beaches for Council's consideration.

The report considers findings from seven months of the hand beach cleaning trial along with a review of available mechanical rake technology and cost estimates for the implementation of each option, including internal and external service models.

4.6 (Cont.)

Background

Council's approach to cleaning Port Phillip Bay beaches has been under review since 2021 in response to community feedback and subsequent Council decisions.

On 5 March 2024, Council was presented with a 'Beach Cleaning Review'. To assist with preparation of the Beach Cleaning Review, Shire officers sought a student placement from Monash University. The Master of Environment and Sustainability student, with the assistance of Shire officers produced a report detailing their findings titled Mornington Peninsula Shire Beach Cleaning Review. With consideration of the review's findings, a hybrid beach cleaning program consisting of mechanical raking and hand cleaning based on localised values including environmental, recreational, access and visitation was the officer recommendation.

On 5 March 2024 Council adopted "*That Council supports a 12-month trial beach cleaning program of Option 4 of 100% hand cleaned beaches. This option recognises the environmental values of the coastline as our top priority*". In response to this decision, the 'Hand beach cleaning trial' commenced on 1 July 2024.

Options for consideration

In response to feedback received from Council at a beach cleaning workshop held on 4 February 2025, four beach cleaning options have been investigated:

- 100% hand cleaning (same as current trial)
- 100% mechanical raking (services 80% of beaches)
- Hybrid – 80% hand cleaning and 20% mechanical raking
- Hybrid – 20% hand cleaning and 80% mechanical raking (same as pre-trial)

On consideration of the data from the first 7 months of the hand beach cleaning trial, a fifth (and recommended option) has been added:

- Hybrid – 70% hand cleaning and 30% mechanical raking (**recommended**)

A review of the five options is provided in Attachment 4, Options – Beach Cleaning Options Assessment.

All five options have been indicatively priced for in-house or outsourced service delivery. The table below ranks each option according to their indicative price as an annual service cost, from lowest cost (1/10) to most expensive (10/10). See Confidential Attachment 8 for more detailed figures.

OPTION NAME	DELIVERY METHOD	PRICE RANKING (low to high)
100% mechanical raking (services 80% of beaches)	Outsourced	1
100% hand cleaning	Inhouse	2
100% hand cleaning	Outsourced	3
Hybrid – 80% hand cleaning and 20% mechanical raking	Outsourced	4

OPTION NAME	DELIVERY METHOD	PRICE RANKING (low to high)
Hybrid – 70% hand cleaning and 30% mechanical raking (recommended)	**Outsourced**	**4**
100% mechanical raking (services 80% of beaches)	Inhouse	6
Hybrid – 20% hand cleaning and 80% mechanical raking	Outsourced	7
Hybrid – 80% hand cleaning and 20% mechanical raking	Inhouse	8
Hybrid – 70% hand cleaning and 30% mechanical raking	Inhouse	8
Hybrid – 20% hand cleaning and 80% mechanical raking	Inhouse	8

ENGAGEMENT

The community has been encouraged to provide feedback throughout the duration of the hand beach cleaning trial via an online survey. Additionally, consultation included in-person pop-ups, direct correspondence, data collected by the beach cleaning service provider, beach audits, and data collected by citizen scientists. A summary of engagement and monitoring data is presented in Attachment 2, Monitoring – Hand Beach Cleaning Trial Monitoring Summary.

COMMUNICATIONS PLAN

The community will be informed of the decision via the existing beach cleaning webpage, media release and social media platforms.

LEGAL AND REGULATORY FRAMEWORK

Observations of Coast Saltwort (*Salsola tragus* subspecies *pontica)* have been reported at various beaches between Portsea and Mount Eliza. This species is listed as 'Endangered in Victoria' under the *Flora and Fauna Guarantee Act 1988* (the Act). Consultation with the administrators of the *Act*, the Department of Energy, Environment and Climate Action (DEECA) is currently underway, to better understand management responsibilities.

The recommended option minimises potential impact on this endangered species.

CLIMATE AND SUSTAINABILITY CONSIDERATIONS

1. The five options presented in this report are ranked from most (1) emission reductions and climate resilience, to least 100% hand cleaning
2. Hybrid – 80% hand cleaning and 20% mechanical raking
3. Hybrid – 70% hand cleaning and 30% mechanical raking **(recommended)**
4. 100% mechanical raking (services 80% of beaches)
5. Hybrid – 20% hand cleaning and 80% mechanical raking

Options ranked 1, 2 and 3 above will reduce the amount of organic matter being disposed to landfill, in comparison to the pre-trial hybrid method (20% hand cleaning and 80% mechanical raking). Allowing organic material to breakdown via natural processes on the coast can reduce carbon emissions, provide habitat and food for animals, provide nutrients to support plant growth, deposit seeds promoting natural regeneration and attenuate wave energy. These outcomes contribute towards a healthier coastal ecosystem and increase erosion resilience of our beaches.

In recognition that contamination within wrack (organic material cast upon the shore) may impact environmental values in some instances and removal of wrack may be necessary. Opportunities to repurpose collected wrack and avoid any organic material being deposited to landfill because of beach cleaning is being explored.

FINANCIAL CONSIDERATIONS

The following options can be accommodated within the current FY25 budget and the proposed FY26 budget, inclusive of anticipated disposal costs:

- 100% hand cleaning (outsourced or insourced delivery)
- 100% mechanical raking (outsourced or insourced delivery)
- Hybrid – 80% hand cleaning and 20% mechanical raking (outsourced delivery only)
- Hybrid – 70% hand cleaning and 30% mechanical raking (outsourced delivery only).

The following options extend beyond the current FY25 budget and the proposed FY26 budget, inclusive of anticipated disposal costs:

- 80% hand cleaning and 20% mechanical raking (inhouse delivery)
- 70% hand cleaning and 30% mechanical raking (inhouse delivery)

OFFICER DIRECT OR INDIRECT INTEREST

No person involved in the preparation of this report has a direct or indirect interest requiring disclosure.

Beach Cleaning Recommendations Report

12 March 2025

Purpose

This report is to present five beach cleaning options for our Port Phillip Bay coastline beach for Councils consideration. The report considers findings from 7 months of the hand beach cleaning trial along with a review of available mechanical rake technology and cost estimates for the implementation of each option, including internal and external service models.

Background

As outlined in the 5 March 2024 Council Report, the Shire's approach to cleaning Port Phillip Bay beaches has been under review sine 2021 in response to community feedback and subsequent Council adopted motions.

On 5 March 2024 Council adopted "*That Council supports a 12-month trial beach cleaning program of Option 4 of 100% hand cleaned beaches. This option recognises the environmental values of the coastline as our top priority*". In response to this adopted decision, the 'Hand beach cleaning trial' commenced on 1 July 2024.

Hand Beach Cleaning Trial Parameters

The hand beach cleaning trial has been implemented by the Shire's open space contractor, Citywide. Citywide employed 4 Full Time Equivalent (FTE) beach hand cleaners who have cleaned 32.5km of beach from Portsea to Mount Eliza, plus a supervisor role. The frequency of cleaning has remained consistent with the previous cleaning program of a fortnightly rotation. The service extent has also remained consistent with the previous cleaning program, extending from the high-water mark to the vegetation (or other upper beach boundary e.g. seawall).

Hand Beach Cleaning Trial Monitoring

Monitoring of the trial has included an online community survey, in-person community engagement, contractor reporting, officer monitoring and volunteer monitoring. A summary of monitoring results are provided in **Attachment 2, Monitoring - Hand Beach Cleaning Trial Monitoring Summary**.

Beach Cleaning Options

In response to feedback received from Council at a beach cleaning workshop held on 4 February 2025, officers have investigated the following four beach cleaning options:

- 100% hand cleaning (same as current trial)
- 100% mechanical raking (services 80% of beaches)
- Hybrid – 80% hand cleaning and 20% mechanical raking
- Hybrid – 20% hand cleaning and 80% mechanical raking (same as pre-trial)

A fifth option has been added by officers which is considered to be the best outcome for our community and environment based on the data available from the first 7 months of the hand beach cleaning trial. The fifth options is:

- Hybrid – 70% hand cleaning and 30% mechanical raking (**recommended**)

A review of the five options is provided in **Attachment 4, Options - Beach Cleaning Options Assessment**.

All five options have been indicatively priced for in-house or outsourced service delivery. Pricing details are outlined within **Confidential Attachment 8, Memo – Beach Cleaning Recommendation Report (Additional Information)**. Prices are to be treated as indicative and as Commercial in Confidence.

To note, all options have been assessed with the following assumptions:

- Cleaning frequency remains as fortnightly rotation.

Beach Cleaning Recommendations Report

MORNINGTON PENINSULA Shire

- Area cleaned remains the same as previously, from the high-water mark to the upper beach (first vegetation or infrastructure) and along beaches managed by other coastal Committees of Management.
- All waste disposal is measured at customer rates.
- Hand cleaning methodology remains as per trial parameters.
- Mechanical cleaning methodology is as per previous contract specifications.
    - Mechanical costing considers the following two technologies:
        - Barber Surf Rake 600HD
        - BeachTech 2000

Financial Ranking

The below is the indicative price ranking table from cheapest option (1/10) to most expensive (10/10) annual service cost, noting figures are detailed in **Confidential Attachment 8**.

OPTION NAME	DELIVERY METHOD	PRICE RANKING (lowest to highest)
100% mechanical raking (services 80% of beaches)	Outsourced	1
100% hand cleaning	Inhouse	2
100% hand cleaning	Outsourced	3
Hybrid – 80% hand cleaning and 20% mechanical raking	Outsourced	4
Hybrid – 70% hand cleaning and 30% mechanical raking (recommended)	**Outsourced**	**4**
100% mechanical raking (services 80% of beaches)	Inhouse	6
Hybrid – 20% hand cleaning and 80% mechanical raking	Outsourced	7
Hybrid – 80% hand cleaning and 20% mechanical raking	Inhouse	8
Hybrid – 70% hand cleaning and 30% mechanical raking	Inhouse	8
Hybrid – 20% hand cleaning and 80% mechanical raking	Inhouse	8

For all insourced options, there is additional in house set up costs ranging from $65,000 to $180,000 in year one. Further information is available in **Confidential Attachment 8**.

Beach Cleaning Recommendations Report

MORNINGTON PENINSULA Shire

Other Considerations

Contractual requirements

The Open Spaces contract outlines the lead time should Shire wish to make changes to the cleaning methodology as outlined below:

- Where Council has issued a Provisional Sum Work Order directing exclusive hand cleaning, such an order may only be substantially varied with 3 months' notice (unless express agreement of lesser time has been given by the Contractor).

All costings provided are estimates only and subject to change once final scope of works and methodology is confirmed.

Lead times for Shire service delivery

Should Council resolve to deliver beach cleaning as an in-house activity, it is important to note that the indicated lead time is greater than 90 days currently for both cars and heavy machinery through the Shire's fleet provider. In addition, Shire would need to commence the formal change process followed by recruitment of staff as outlined in **Confidential Attachment 8**.

Mechanical Rake Technologies

Officers have prepared **Confidential Attachment 9, Technologies - Beach Cleaning Mechanical Technology Review** for Councils consideration. The review provides an overview of five mechanical beach cleaning technologies from four service providers. The Barber Surf Rake 600HD and BeachTech 2000 have been explored further within option costings as they are considered to best meet the existing beach cleaning contract specifications, have a greater coverage capacity and are the preferred method for various Councils across Australia.

In-kind support to Committees of Management

The Shire provides in-kind support to three Port Phillip Bay Committees of Management (CoM) by cleaning their beaches. The three CoM areas (WhiteCliffs to Cameron's Bight CoM – 3.4km, Capel Sound Foreshore CoM – 2.4km and Dromana Foreshore CoM – 2.9km) equates to 8.7km or approximately 26% of the beaches serviced under the Council's beach cleaning program.
The staff costs to clean these beaches is approximately $20,000 per year, plus waste disposal costs. The costs to clean is relatively small as the equipment and staff are utilised to clean the remainder of the beaches that Shire is responsible for. A cost recovery option for both fixed costs and disposal costs and seek reimbursement for wages and disposal from the CoM's to continue delivering the service could be considered.

Recommendations

1. Hybrid – 70% hand cleaning and 30% mechanical raking
   Analysis to determine beach cleaning method considers localised beach accessibility, recreational values, visitation rates, coastal setting, community sentiment and litter volumes collected throughout the first seven months of the hand cleaning trial. Details are provided within **Attachment 4**. An outsourced deliver model of this option is recommended as indicative pricing of outsourced delivery is cheaper than internal delivery as detailed in **Confidential Attachment 8**.

2. Council's decision on beach cleaning methodology is recommended to cover the period from Council decision until 30 June 2028 to align with existing contractual arrangements.

Beach Cleaning Recommendations Report

MORNINGTON PENINSULA Shire

Attachments

2. Monitoring - Hand Beach Cleaning Trial Monitoring Summary
3. Monitoring - Beach Cleaning Trial Monitoring Methods

4. Options - Beach Cleaning Options
5. Options - Beach Cleaning Options Maps
6. Options - Hybrid: 80% Hand Cleaning and 20% Mechanical Raking Values Analysis
7. Options - Hybrid: 70% Hand Cleaning and 30% Mechanical Raking Values Analysis

8. Memo – Beach Cleaning Recommendations Report (Additional Information) (CONFIDENTIAL)

9. Technologies - Mechanical Beach Cleaning Technologies Review (CONFIDENTIAL)
10. Technologies - Surf Rake Brochure
11. Technologies - Surf Rake Manual
12. Technologies - BeachTech Overview
13. Technologies - BT1500 Specifications
14. Technologies - BT200 Specifications
15. Technologies - Clean Coast Solutions Introduction

Hand Beach Cleaning Trial Monitoring Summary

17 February 2025

Introduction

This document provides a summary of monitoring data collected during the Hand Beach Cleaning Trial. The Hand Beach Cleaning Trial commenced on 1 July 2024. The data presented in this report is representative of the period from 1 July 2024 to 17 February 2025. Monitoring of the trial continues with the contents of this report to be updated as more data is collected.

Monitoring data presented in this report is split into the following categories:

1. **Contractor Data**
   Litter collection statistics reported by the Shire's beach cleaning contractor, Citywide.

2. **Beach Audits**
   Micro and macro-plastic and wrack assessments completed by Shire officers. Citizen scientist data has also been collected and is presented within this document.

3. **Community Feedback**
   Results from online and in person survey engagement as well as some quotes from community written feedback.

1. Contractor Data

Between the period of 1 July 2024 and 6 February 2025, Citywide have reported the following collection statistics.

Fortnightly cleaning cycle collection data

Date Started	Date Completed	Waste Collected (Litres)	Bird Count	Fish Count	Syringe Count	Hard Waste Count
02/07/2024	11/07/2024	2,477	0	0	2	10
12/07/2024	24/07/2024	3,990	0	0	10	15
27/07/2024	09/08/2024	4,540	13	0	10	8
12/08/2024	23/08/2024	3,652	14	167	8	3
26/08/2024	13/09/2024	9,000	23	151	66	10
16/09/2024	02/10/2024	5,275	11	62	18	4
02/10/2024	14/10/2024	3,520	4	26	17	1
14/10/2024	23/10/2024	2,580	7	4	10	6
24/10/2024	01/11/2024	2,395	6	2	6	1
04/11/2024	14/11/2024	2,482	15	8	6	1
18/11/2024	28/11/2024	3,430	9	2	9	7
28/11/2024	10/12/2024	2,368	7	5	5	5
10/12/2024	24/12/2024	2,640	8	0	4	8
30/12/2024	10/01/2025	3,650	0	0	2	3
13/01/2025	23/01/2025	4,022	0	1	4	12
24/01/2025	06/02/2025	3,519	1	0	1	7
Running Totals		**59,540**	**118**	**428**	**178**	**101**

Hand Beach Cleaning Trial Monitoring Summary

MORNINGTON PENINSULA Shire

Review of the fortnightly and monthly contractor collection data provides insight to the times of year when litter is most prevalent on our Port Phillip Bay beaches.

Hand Beach Cleaning Trial Monitoring Summary

MORNINGTON PENINSULA Shire

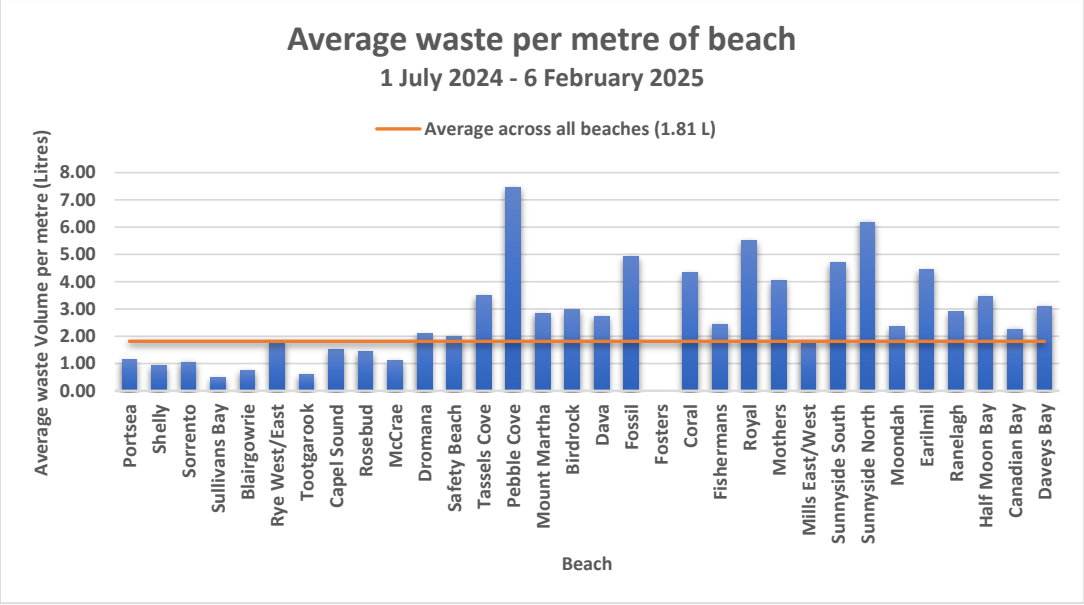
Contractor collection data per beach

Note, beaches are ordered from the southern peninsula (Portsea) to the northern peninsula (Mount Eliza).

Beach Front	Waste Collected (Litres)	Bird Count	Fish Count	Syringe Count	Hard Waste Count
Portsea	557	1	7	0	1
Shelly	805	3	6	0	2
Sorrento	1,540	5	7	1	5
Sullivans Bay	209	0	7	0	1
Blairgowrie	2,575	10	26	1	2
Rye West/East	4,265	12	112	5	3
Tootgarook	1,405	16	25	6	0
Capel Sound	2,555	18	20	2	2
Rosebud	4,285	7	14	4	11
McCrae	1,890	6	7	1	7
Dromana	6,050	8	42	12	3
Safety Beach	6,650	8	43	12	5
Tassels Cove	585	1	1	0	1
Pebble Cove	895	0	0	0	5
Mount Martha	6,320	7	65	25	10
Birdrock	895	1	11	6	2
Dava	850	2	12	3	4
Fossil	271	1	2	4	1
Fosters	0	0	0	0	0
Coral	540	0	3	1	1
Fishermans	1,300	1	3	5	0
Royal	1,055	1	2	5	1
Mothers	2,170	1	4	2	5
Mills East/West	1,290	0	3	4	2
Sunnyside South	1,315	1	0	7	3
Sunnyside North	1,665	2	1	14	7
Moondah	3,000	1	1	27	4
Earilmil	1,182	0	1	19	1
Ranelagh	1,410	2	2	5	7
Half Moon Bay	450	2	0	1	0
Canadian Bay	978	1	0	2	4
Daveys Bay	583	0	1	4	1
Overall Totals	**59,540**	**118**	**428**	**178**	**101**

Hand Beach Cleaning Trial Monitoring Summary

MORNINGTON PENINSULA Shire



Review of litter collected per beach with consideration of beach length can provide an indication of where beach litter is a more prevalent issue.

Hand Beach Cleaning Trial Monitoring Summary

MORNINGTON PENINSULA Shire

2. Beach Audits

Shire Officers

Officers have been routinely auditing the condition of six select beaches throughout the trial. Monitoring of these beaches commenced in May 2024 with data from May and June 2024 represented as 'Background' when the previous mechanical rake was in operation.

Monitoring methods were developed in consultation with the Port Phillip Eco Centre and with reference to the Australian Marine Debris Initiative. A copy of the monitoring methods are available within **Attachment 3, Monitoring - Beach Cleaning Trial Monitoring Methods**.

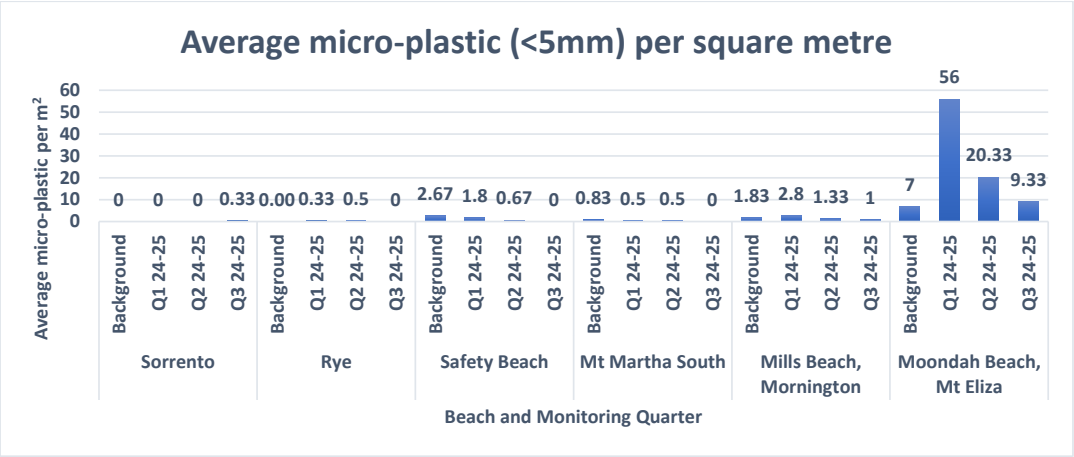
A summary of results are as per the below figures.

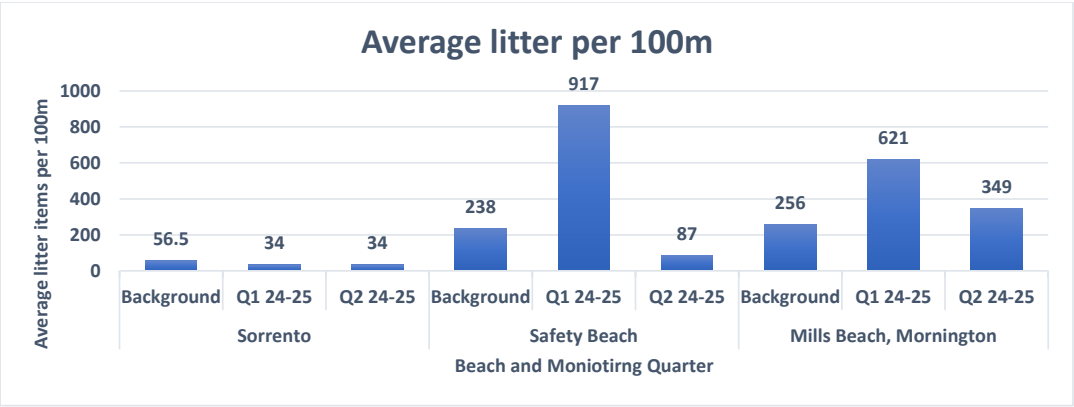
Beach	Trial Quarter	Average Micro-plastic (<5mm) (per m^2)	Average litter (per m^2)	Average wrack (% per m^2)*	Average litter (Items per 100m)
Sorrento	Background	0	0.5	11.0%	56.5
	Q1 24-25	0	0.25	6.7%	34
	Q2 24-25	0	0.75	5.0%	34
	Q3 24-25	0.33	2	7.3%	-
Rye	Background	0.00	1.5	5.0%	-
	Q1 24-25	0.33	2	14.8%	-
	Q2 24-25	0.5	1.17	5.0%	-
	Q3 24-25	0	1	5.0%	-
Safety Beach	Background	2.67	5.22	10.0%	238
	Q1 24-25	1.8	5.5	9.7%	917
	Q2 24-25	0.67	2	5.3%	87
	Q3 24-25	0	3.67	5.0%	-
Mount Martha South	Background	0.83	1.83	8.0%	-
	Q1 24-25	0.5	2.7	5.5%	-
	Q2 24-25	0.5	1.33	5.0%	-
	Q3 24-25	0	2.67	5.0%	-
Mills Beach, Mornington	Background	1.83	5.5	6.7%	256
	Q1 24-25	2.8	5.7	5.0%	621
	Q2 24-25	1.33	3.67	5.0%	349
	Q3 24-25	1	6.67	5.0%	-
Moondah Beach, Mt Eliza	Background	7	11.5	18.0%	-
	Q1 24-25	56	84.2	10.3%	-
	Q2 24-25	20.33	26.67	8.7%	-
	Q3 24-25	9.33	13.67	5.8%	-

*5% is the lowest assessed value. Recordings of <5% are input as 5%

Hand Beach Cleaning Trial Monitoring Summary

MORNINGTON PENINSULA Shire





Frankston Comparison Audit

In December 2024 (Q2), Shire officers collaborated with representatives from Frankston City Council to audit the beach surrounding Frankston Pier beach is routinely mechanically raked. Results were as follows.

Beach	Trial Quarter	Average Micro-plastic (<5mm) (per m^2)	Average litter (per m^2)	Average wrack (% per m^2)*	Average litter (Items per 100m)
Frankston	**Q2 24-25**	4.33	9	5.0%	880
Same Quarter Comparison Results at MPS beaches					
Sorrento	**Q2 24-25**	0	0.75	5.0%	34
Safety Beach	**Q2 24-25**	0.67	2	5.3%	87
Mills Beach	**Q2 24-25**	1.33	3.67	5.0%	349

*5% is the lowest assessed value. Recordings of <5% are input as 5%

Hand Beach Cleaning Trial Monitoring Summary

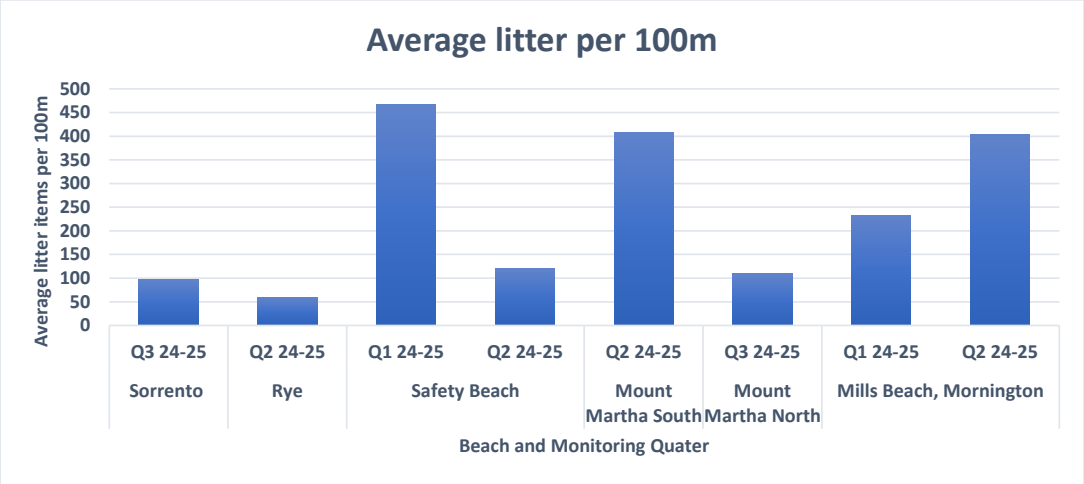
MORNINGTON PENINSULA Shire

Citizen Scientists

Community volunteers have contributed to data collection by following the officer developed 'Coastal Shoreline Litter Monitoring' method and reporting their findings.

A summary of citizen science results are as per the below figures.

Beach	Trial Quarter	Average litter (Items per 100m)
Sorrento	Q3 24-25	98
Rye	Q2 24-25	59.5
Safety Beach	Q1 24-25	468
	Q2 24-25	120.5
Mount Martha South	Q2 24-25	408
Mount Martha North	Q3 24-25	109
Mills Beach, Mornington	Q1 24-25	233
	Q2 24-25	403



Hand Beach Cleaning Trial Monitoring Summary

MORNINGTON PENINSULA Shire

3. Community Feedback

Online Survey Responses

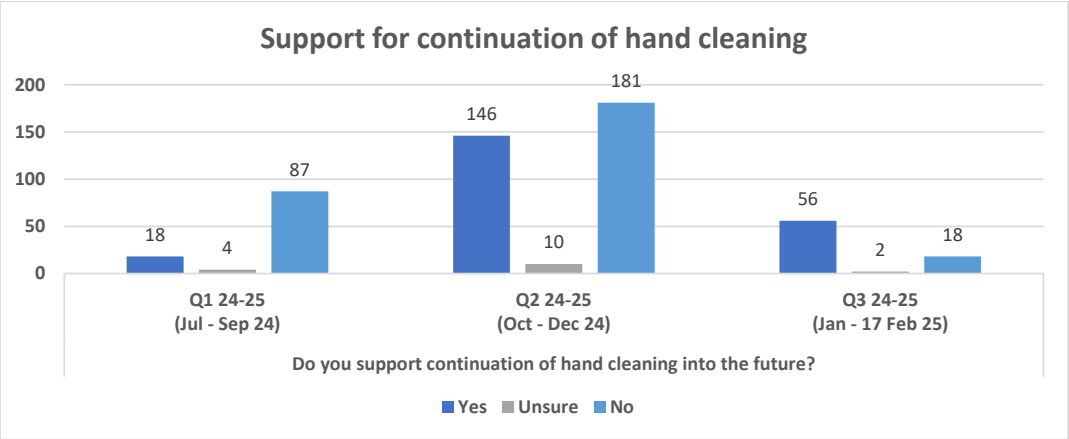
A public survey has been available on the Beach Cleaning webpage since 1 July 2024. This survey seeks feedback on the observed impacts of the hand cleaning trial. The survey is available for community to respond multiple times. The intent of this was to allow continued feedback as community members observed changes along our beaches.

A summary of results is provided below.

Online Survey Responses							
Q1 (Jul - Sep) number of responses:	109						
Q2 (Oct - Dec) number of responses:	337						
Q3 (Jan - 17 Feb) number of responses:	76						
Total number of responses:	522						
Since 1 July 2024, have you noticed a change in the amount of litter with the introduction of hand cleaning at your local beach(es)?		Yes		Not Sure		No	
	Q1 24-25	89	82%	1	1%	19	17%
	Q2 24-25	240	71%	24	7%	73	22%
	Q3 24-25	67	88%	3	4%	6	8%
	Total	**396**	**76%**	**28**	**5%**	**98**	**19%**
Since 1 July 2024, have you noticed an improvement to the natural environment, such as more shorebirds and increased vegetation on the foredunes?		Yes		Not Sure		No	
	Q1 24-25	15	14%	7	6%	87	80%
	Q2 24-25	124	37%	27	8%	186	55%
	Q3 24-25	46	61%	7	9%	23	30%
	Total	**185**	**35%**	**41**	**8%**	**296**	**57%**
Compared to this time last year, do you find the beach more or less enjoyable to visit now?		More Enjoyable		Neutral		Less Enjoyable	
	Q1 24-25	9	8%	11	10%	89	82%
	Q2 24-25	121	36%	30	9%	186	55%
	Q3 24-25	46	61%	7	9%	23	30%
	Total	**176**	**34%**	**50**	**10%**	**296**	**57%**
Do you support continuation of hand cleaning into the future?		Yes		Undecided		No	
	Q1 24-25	18	17%	4	4%	87	80%
	Q2 24-25	146	43%	10	3%	181	54%
	Q3 24-25	56	74%	2	3%	18	24%
	Total	**220**	**42%**	**16**	**3%**	**286**	**55%**

Hand Beach Cleaning Trial Monitoring Summary

MORNINGTON PENINSULA Shire



From 522 online survey responses received between 1 July 2024 and 17 February 2025: 220 (42%) respondents support continuation of hand cleaning, 16 (3%) were undecided and 286 (55%) did not support continuation of hand cleaning.

'Do you support continuation of hand cleaning into the future?' responses by township				
Beach	**Yes**	**Undecided**	**No**	**Difference***
Mount Eliza	9	0	38	-29
Mornington	47	1	52	-5
Mount Martha	69	1	65	4
Safety Beach	64	6	77	-13
Dromana	52	6	74	-22
McCrae	48	2	37	11
Rosebud	46	5	52	-6
Capel Sound	41	0	35	6
Tootgarook	35	0	27	8
Rye	69	0	37	32
Blairgowrie	32	1	26	6
Sorrento	22	0	14	8
Portsea	14	0	5	9
General Feedback	44	2	20	24

*Positive results indicate more 'yes' responses. Negative results indicate more 'no' responses.

Hand Beach Cleaning Trial Monitoring Summary

MORNINGTON PENINSULA Shire

In-person Engagement

On 17 January 2025 officers completed two community pop-ups, seeking community to complete hard copies of the online survey form. Officers attended Safety Beach from 10am – 12pm and Mills Beach, Mornington from 1-3pm. Results are presented below.

In-person Survey Responses - 17 January 2025							
Safety Beach	19						
Mills Beach	5						
Total number of responses:	24						
Since 1 July 2024, have you noticed a change in the amount of litter with the introduction of hand cleaning at your local beach(es)?		Yes		Not Sure		No	
	Safety Beach	13	68%	3	16%	3	16%
	Mills Beach	3	60%	0	0%	2	40%
	Total	**16**	**67%**	**3**	**13%**	**5**	**21%**
Since 1 July 2024, have you noticed an improvement to the natural environment, such as more shorebirds and increased vegetation on the foredunes?		Yes		Not Sure		No	
	Safety Beach	12	63%	4	21%	3	16%
	Mills Beach	1	20%	2	40%	2	40%
	Total	**13**	**54%**	**6**	**25%**	**5**	**21%**
Compared to this time last year, do you find the beach more or less enjoyable to visit now?		More Enjoyable		Neutral		Less Enjoyable	
	Safety Beach	8	42%	8	42%	3	16%
	Mills Beach	2	40%	2	40%	1	20%
	Total	**10**	**42%**	**10**	**42%**	**4**	**17%**
Do you support continuation of hand cleaning into the future?		Yes		Undecided		No	
	Safety Beach	14	74%	2	11%	3	16%
	Mills Beach	2	40%	2	40%	1	20%
	Total	**16**	**67%**	**4**	**17%**	**4**	**17%**

Direct email feedback

Officers have received direct emails expressing feedback on the hand beach cleaning trial. Feedback presented a variety of opinions with some notable comments provided below.

- "*observed Salsola tragus ssp pontica (Endangered under the Flora and Fauna Guarantee Act). This species located between the high tide mark and the foredune must be protected from machine cleaning."*
- *"Since this organic litter is now not being removed it makes some sections of the beach dangerous to walk on (and an eyesore). Tree branches become covered in sand and stab you in your feet when stepped on. Recently our grandchildren both suffered injuries to their feet due to this issue (this type of injury has not occurred previously)."*
- *"I would like to congratulate the Shire on the trial without the mechanical raker. We have noticed a huge difference in the reduction of rubbish on the foreshore and an increased level of biodiversity."*
- *"We have been camper and rate payer along the beach for the past 10 years and this year has been by far the worst where we have to get out on the beach and rake the weed the sticks and anything else that has been left."*
- *"the fact that the beach is no longer raked and graded means large culverts and mounds are developing in some areas making it more difficult to find a flat area for families to erect umbrellas or cabana's."*

Hand Beach Cleaning Trial Monitoring Summary

MORNINGTON PENINSULA Shire

- *"On the weekend I had family friends visit for the first time in a while. They commented on the terrible state of our once pristine beach. They were reluctant to let their young children play in this mess!"*
- *"Just to let you know it's so good seeing the beach once again as a real beach with real seaweed and real shells. A natural place for children to play in and learn about nature."*

On 1 October 2024, officers received a letter acknowledging "*unanimous agreement between the Foreshore Managers that the hand cleaning trial is a positive step in the right direction for reducing litter on the beaches and commend the Shire for initiating the trial*". The letter was undersigned by Balnarring Foreshore Manager, Capel Sound Foreshore Manager, Dromana Foreshore Ranger, Point Leo Foreshore Park and Reserve Manager, Shoreham Foreshore Manager and Whitecliffs to Camerons Bight Foreshore Reserve Foreshore Manager.

Hand Beach Cleaning Trial 2024-25 Monitoring Methodology

MORNINGTON PENINSULA Shire

Microplastic Beach Litter Audits with Wrack Coverage Assessment

This monitoring method has been developed by blending two techniques previously used by the Port Phillip Bay EcoCentre (Litter Surveys) and C. Hull of University of Melbourne (*Combining Marine Ecology and Coastal Geomorphology: A Spatial Study of Temperate Intertidal Macrofauna within Western Port Bay, Victoria, C. Hull, June 2019*).

Responsibility:

- Volunteers when possible (i.e. alongside monthly BeachPatrol events) at various locations.
- The Shire at a minimum of once every 6 weeks at various monitoring locations.

Desired outcomes:

- To understand the presence of micro and macro plastics within the three beach zones across multiple sites.
- To quantify the presence of seaweed with the three beach zones across multiple sites

Method:

1. A recognisable permanent structure at the top of the beach serves as the starting point for the transect and the same location is repeated each survey. The transect will run from the permanent landmark at the top of the beach the last high-tide line (usually a trail of seaweed along the beach).

2. Describe the permanent landmark at the top of the beach in the “Start landmark” field at top left side of the datasheet.

3. **Measure and record** the distance from the top of the beach to the most recent high tide line.

4. Divide the distance from transect start to finish by 2 to calculate the location of the middle quadrat.

5. At the top of the beach (at the transition between sand and vegetation or hard against a physical structure), mark a 1m x 1m square quadrat (quadrat 1).

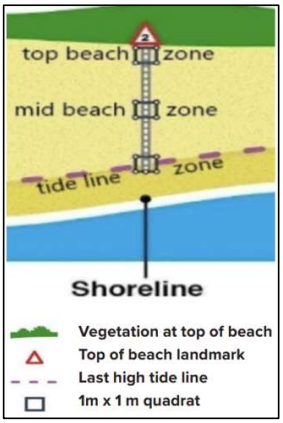
6. **Photograph** the quadrat.

7. **Record** the wrack coverage percentage by measuring how much of the quadrat surface is wrack (i.e. 0.5m x 0.3m wrack = 0.15m2. (0.15/1) x 100 = 15%).
   Do not dig into the sand, only record surface area.
   Note, wrack is organic material cast on the shore i.e., seaweed.

8. Complete litter data collection in the quadrat. Spend a minimum of 5 minutes collecting litter from within the quadrat, placing within a labelled container to analyse later, when not exposed to the elements.
   Do not dig into the sand, only collect litter on top of the sand.
   Note, if more than one person is collecting litter from a quadrat, divide the time (5 minutes) by the number of people to determine how long to assess the quadrat e.g., 5/2= 2.5 minute minimum for two people.

9. Repeat steps 5-8 for the middle beach (quadrat 2) and high-tide line (quadrat 3).

10. **Sort and record** the litter from each quadrat using the following monitoring form.



Developed with reference to:

Hand Beach Cleaning Trial 2024-25 Monitoring Methodology

MORNINGTON PENINSULA Shire

Microplastic Beach Litter Audits with Wrack Coverage Assessment Monitoring Form

Location: Date:
Transect Start Landmark: Survey By:
Distance top of beach to last high tide line:
Recent notable weather (Y/N): No. Volunteers
Start time: Finish time:

Wrack Coverage (%) **Q1 (Top):** **Q2 (Mid):** **Q3(Tide):**

General observations:
Is there litter present in the general area (surrounding quadrats)?

Do the quadrats appear to represent the surrounding area? If no, why not?

If the quadrats do not appear to represent the surrounding area, consider an additional quadrat (Q4) in a representative location for comparison.

General Notes			
Q1. Top of Beach	Q2. Mid Beach	Q3. High Tide	Other Notes

Developed with reference to:

Hand Beach Cleaning Trial 2024-25 Monitoring Methodology

MORNINGTON PENINSULA Shire

Litter Type	Q1	Q2	Q3
Bait			
Ice			
Retail store			
Shopping (grey)			
Shopping (white)			
Zip-lock			
Plastic Bags Total			
Bleach/cleaner			
Caps			
Fruit juice / milk bottle			
Water bottle			
Plastic Bottles Total			
Fruit juice/milk			
Straws			
Drink Cartons Total			
Bubble wrap			
Cable ties			
Strapping (scrap)			
Strapping (whole)			
Tile spacers			
Ear plugs			
Sealant Caps			
Industry Total			
Fishing line			
Fishing lures			
Fishing Total			
Cellophane wrap			
Cigarette lighters			
Clingwrap/film			
Cups			
Confectionary wraps			
Food (soft)			
Forks/knives/spoons			
Jars/lids			
Lollypop sticks			
6 pack can holders			
Sauce sachets			
Smoothie cups/lids			
Soy sauce fish/caps			
Takeaway tubs/lids			
Food Packaging Total			

Litter Type	Q1	Q2	Q3
Dental floss			
Pens/markers			
Syringes			
Band aids			
Medical/Cosmetic Total			
Toys (Eg spade, glow bands)			
Hard fragments <5mm			
Hard fragments 5mm +			
Soft fragments <5mm			
Soft fragments 5mm +			
Plastic Fragments Total			
Beads			
Food boxes/trays			
Pieces <5mm			
Pieces 5mm +			
Packaging			
Polystyrene Total			
Nurdles			
Cigarette Butts			
Clothing (including labels)			
Other Plastic			
Total Plastics			
Intact glass			
Broken Glass			
Total Glass			
Bottle Caps			
Other Metal			
Total Metal			
Other Non-plastic materials			
Total Non-Plastic			
Total Litter			

Notes:

Developed with reference to:

Hand Beach Cleaning Trial 2024-25 Monitoring Methodology

MORNINGTON PENINSULA Shire

Coastal Shoreline Litter Monitoring

This monitoring method has been developed to reflect the ADMI Coastal Shoreline Monitoring method outlined in the AMDI Monitoring Protocols for Litter and Marine Debris – Coastal Shoreline. This technique is to focus on macroplastics.

Responsibility:

- The Shire to complete quarterly (every 3 months) at a minimum.
- Volunteers when possible.

Desired outcome:

- To understand macroplastic litter presence at various beaches and establish a comparable means of reporting.

Method:

1. Monitoring locations have been pre-determined as outlined below.

2. Set Transects. Use a random number generator (website or app) and set your range from 0 to the length of the monitoring location minus 25. Randomly generate four numbers. These will be your transect locations. For example, Sorrento is 445m long, so the range is 0 - 420. The random numbers generated may be 29, 122, 270, 356, these numbers represent how many meters from the start point of the monitoring location your transects will begin. Make sure your transects do not overlap, you may need to generate additional random numbers to get a viable set.

3. Each transect will be 25m wide (parallel with the water) and start from the most recent high tide line to the first vegetation or structure at the top of the beach (e.g. seawall). Mark the four corners of the transect.
   Record the length of the transect from the most recent high tide mark to the first vegetation.
   Photograph each transect before litter collection.
   Record the start and end time of each transect.

4. Walk the transect, collecting any litter within a labelled collection bag (e.g. Transect 1).
   Do not collect litter from outside the transect within this collection bag as this will skew the results.

5. Repeat steps 3 and 4 for each of the remaining 3 transects.

Image 5.11 - Transects are set at four random distances along the length of the site*.

6. **Record** the total weight of litter items collected per transect.
   Sort and record the litter types using following monitoring form.
   Photograph sorted litter from each transect.
   Note, sort in a protected location to avoid light items being blown away.

Note, the use of this technique, monitoring a total of 100 lineal meters of a beach also allows for direct comparison with common techniques used in Europe as described here: Beach litter | OSPAR Commission. In 2020 the European Union agreed that 20 litter items per 100 meters of coastline was an acceptable threshold (*A European Threshold Value and Assessment Method for Macro Litter on Coastlines (2020)*).

Pg 1 of 2

Developed with reference to:

Hand Beach Cleaning Trial 2024-25 Monitoring Methodology

MORNINGTON PENINSULA Shire

Coastal Shoreline Litter Monitoring From

Location: Date:
Start Landmark: Survey By:
Total monitoring location length:
Recent notable weather (Y/N): No. Volunteers
Start time: Finish time:

	T1	T2	T3	T4
Distance from 0m				
Transect Width (tide line to vegetation)				
Litter Type				
Bait				
Ice				
Retail store				
Shopping (grey)				
Shopping (white)				
Zip-lock				
Plastic Bags Total				
Bleach/cleaner				
Caps				
Fruit juice / milk bottle				
Water bottle				
Plastic Bottles Total				
Fruit juice/milk				
Straws				
Drink Cartons Total				
Bubble wrap				
Cable ties				
Strapping (scrap)				
Strapping (whole)				
Tile spacers				
Ear plugs				
Sealant Caps				
Industry Total				
Fishing line				
Fishing lures				
Fishing Total				
Cellophane wrap				
Cigarette lighters				
Clingwrap/film				
Cups				
Confectionary wraps				
Food (soft)				
Forks/knives/spoons				
Jars/lids				
Lollypop sticks				

Litter Type	T1	T2	T3	T4
6 pack can holders				
Sauce sachets				
Smoothie cups/lids				
Soy sauce fish/caps				
Takeaway tubs/lids				
Food Packaging Total				
Dental floss				
Pens/markers				
Syringes				
Band aids				
Medical/Cosmetic Total				
Toys (Eg spade, glow bands)				
Hard fragments <5mm				
Hard fragments 5mm +				
Soft fragments <5mm				
Soft fragments 5mm +				
Plastic Fragments Total				
Beads				
Food boxes/trays				
Pieces <5mm				
Pieces 5mm +				
Packaging				
Polystyrene Total				
Nurdles				
Cigarette Butts				
Clothing (including labels)				
Other Plastic				
Total Plastics				
Intact glass				
Broken Glass				
Total Glass				
Bottle Caps				
Other Metal				
Total Metal				
Other Non-plastic materials				
Total Non-Plastic				
Total Litter				
Total Weight (g)				

Notes:

Developed with reference to:

Hand Beach Cleaning Trial 2024-25 Monitoring Methodology

MORNINGTON PENINSULA Shire

Coastal Foredune Litter Audit

This test is designed to extend upon the method of the above 'Coastal Shoreline Litter Monitoring' and asses the presence of litter within the foredune vegetation. Hand cleaning is expected to provide greater flexibility to clean within the foredune vegetation.

Responsibility:

- The Shire to complete quarterly (every 3 months) at a minimum, alongside Coastal Shoreline Litter monitoring.
- Volunteers, when possible, various locations preferable.

Desired outcome: To quantify the benefits hand cleaning throughout foredune vegetation.

Method:

1. Set a 25m long (parallel with the water) transect within the foredune area which is lightly vegetated (easily navigated with clear sightlines, predominately coastal grasses). Mark the four corners of the transect.
   Record width of the transect (dense vegetation to upper beach)
   Photograph the transect before litter collection (overview photo that is representative of transect)
   Record the start and end time of each transect.

2. Walk the transect, collecting any litter within a labelled collection bag (e.g. Transect 1).
   Do not collect litter from outside the transect within this collection bag as this will skew the results.

Example Coastal Foredune Litter Audit transect.

3. **Record** the total weight of litter items collected in the transect.
   Sort and record the litter types using below monitoring form.
   Photograph sorted litter from the transect.
   Note, sort in a protected location to avoid light items being blown away.

Developed with reference to:

Hand Beach Cleaning Trial 2024-25 Monitoring Methodology

MORNINGTON PENINSULA Shire

Coastal Foredune Litter Audit Monitoring Form

Location: Date:
Start Landmark: Survey By:
Monitoring location width (start of foredune vegetation to dense vegetation) (m):
Recent notable weather (Y/N): No. Volunteers
Start time: Finish time:

Litter Type	Foredune Transect
Bait	
Ice	
Retail store	
Shopping (grey)	
Shopping (white)	
Zip-lock	
Plastic Bags Total	
Bleach/cleaner	
Caps	
Fruit juice / milk bottle	
Water bottle	
Plastic Bottles Total	
Fruit juice/milk	
Straws	
Drink Cartons Total	
Bubble wrap	
Cable ties	
Strapping (scrap)	
Strapping (whole)	
Tile spacers	
Ear plugs	
Sealant Caps	
Industry Total	
Fishing line	
Fishing lures	
Fishing Total	
Cellophane wrap	
Cigarette lighters	
Clingwrap/film	
Cups	
Confectionary wraps	
Food (soft)	
Forks/knives/spoons	
Jars/lids	
Lollypop sticks	
6 pack can holders	
Sauce sachets	
Smoothie cups/lids	
Soy sauce fish/caps	
Takeaway tubs/lids	
Food Packaging Total	

Litter Type	Foredune Transect
Dental floss	
Pens/markers	
Syringes	
Band aids	
Medical/Cosmetic Total	
Toys (E.g. spade, glow bands)	
Hard fragments <5mm	
Hard fragments 5mm +	
Soft fragments <5mm	
Soft fragments 5mm +	
Plastic Fragments Total	
Beads	
Food boxes/trays	
Pieces <5mm	
Pieces 5mm +	
Packaging	
Polystyrene Total	
Nurdles	
Cigarette Butts	
Clothing (including labels)	
Other Plastic	
Total Plastics	
Intact glass	
Broken Glass	
Total Glass	
Bottle Caps	
Other Metal	
Total Metal	
Other Non-plastic materials	
Total Non-Plastic	
Total Litter	
Total Weight (g)	
Notes:	

Developed with reference to:

Beach Cleaning Options Assessment

MORNINGTON PENINSULA Shire

12 March 2025

Introduction

This document provides an overview of five beach cleaning options for Council consideration.

The five beach cleaning options are:

1. 100% hand cleaning (same as current trial)
2. 100% mechanical raking (services 80% of beaches)
3. Hybrid – 80% hand cleaning and 20% mechanical raking
4. Hybrid – 70% hand cleaning and 30% mechanical raking (**recommended**)
5. Hybrid – 20% hand cleaning and 80% mechanical raking (same a pre-trial)

Percentages are based on the 32.5km length of serviced Port Phillip Bay beaches and have been rounded for naming purposes.

Options are in order of price indications (lowest to highest) for annual in-house service delivery.

All options are mapped, available in **Attachment 5, Options - Beach Cleaning Options Maps**.

Option 1 – 100% Hand Cleaning

This option would continue the service currently being delivered under the hand beach cleaning trial. All 32.5km of Port Phillip Bay beaches are cleaned by hand with no mechanical intervention for cleaning purposes.

Considerations

- Option does not consider the data collected throughout the Hand Cleaning Trial including community sentiment and litter volumes.
- Organic material is retained on beaches.
- Organic material can impact perceived amenity and recreational use of beaches.
- Sand management with mechanical means will still occur when necessary.
- Encourages natural coastal processes including deposition of wrack (organic material cast upon the shore i.e. seaweed) and vegetation growth.

Cost Estimate

Each of the five beach cleaning options have been indicatively priced for internal and external service delivery models. Prices are to be treated as indicative and as Commercial in Confidence. Pricing details are outlined within **Confidential Attachment 8, Memo - Beach Cleaning Recommendation Report (Additional Information).**

Cost rankings are an indication of the least expensive (1/10) to most expensive (10/10) delivery option and model.

In-house Delivery Model: 2/10

Outsourced delivery Model: 3/10

Beach Cleaning Options Assessment

MORNINGTON PENINSULA Shire

Option 2 – 100% Mechanical Raking

This option would result in 27km of beaches being mechanically raked. Approximately 5.5km of beaches that are currently serviced under the beach cleaning contract would not be cleaned as they are not accessible by mechanical rake.

Beaches **not** cleaned under this option:

Township	Beach
Mount Eliza	Daveys Bay
Mount Eliza	Half Moon Bay
Mount Eliza	Earimil
Mount Eliza	Moondah
Mount Eliza	Sunnyside North
Mornington	Royal
Mornington	Coral
Mornington	Fosters
Mornington	Fossil
Mount Martha	Dava
Mount Martha	Birdrock
Mount Martha	Pebble Cove
Sorrento	Sullivan Bay
Portsea	Shelly
Portsea	Portsea Foreshore

Considerations

- 5.5km of beaches will not be cleaned under this model.
- Return of groomed amenity to approximately 27km of beaches.
- Potential reputational risk in returning to a rake dominant model after a review and trial where collected data can inform improved practices.

Please note, a seaweed recycling trial is currently underway between some Port Phillip Bay Councils and private business. If successful, this innovation may reduce or prevent collected organic material from entering landfill. Vegetation including a Flora and Fauna Guarantee Act endangered listed species (Salsola Tragus Pontica) has been reported within some Port Phillip Bay beaches. Ground truthing and consultation with DEECA is required to better understand management responsibilities.

Cost Estimate

Each of the five beach cleaning options have been indicatively priced for internal and external service delivery models. Prices are to be treated as indicative and as Commercial in Confidence. Pricing details are outlined within **Confidential Attachment 8**.

Cost rankings are an indication of the least expensive (1/10) to most expensive (10/10) delivery option and model.

In-house Delivery Model: 6/10

Outsourced delivery Model: 1/10

Beach Cleaning Options Assessment

MORNINGTON PENINSULA Shire

Option 3 – Hybrid: 80% Hand Cleaning and 20% Mechanical Raking

This option is informed by localised beach accessibility and values including environmental, recreational and visitation. Assessments for this recommendation were completed in 2024 and presented to Council as the officer recommend option in the 5 March 2024 Council Report.

Under this option accessible areas which have high recreational values and modified coastal environments are recommended for mechanical raking. Areas with higher environmental values are recommended for hand cleaning.

This option results in approximately 26.5km of Port Phillip Bay beaches being hand cleaned and 6km of beaches being mechanically raked.

A copy of the methodology applied to determine beach values and subsequent cleaning methodology is provided in **Attachment 6, Hybrid: 80% Hand Cleaning and 20% Mechanical Raking Values Analysis**.

Beach Cleaning Method

Township	Beach Name	Cleaning Method
Mount Eliza	Daveys Bay	Hand
Mount Eliza	Canadian Bay	Hand
Mount Eliza	Half Moon Bay	Hand
Mount Eliza	Ranelagh	Mechanical
Mount Eliza	Earimil	Hand
Mount Eliza	Moondah North	Hand
Mount Eliza	Moondah	Hand
Mount Eliza	Sunnyside North	Hand
Mount Eliza	Sunnyside South	Hand
Mornington	Mills East	Hand
Mornington	Mills West	Mechanical
Mornington	Shire Hall Beach	Hand
Mornington	Scouts	Hand
Mornington	Mothers	Mechanical
Mornington	Royal	Hand
Mornington	Fishermans	Hand
Mornington	Coral	Hand
Mornington	Fosters	Hand
Mornington	Fossil	Hand
Mornington	Dava	Hand
Mount Eliza	Birdrock	Hand
Mount Martha	Mount Martha North	Hand
Mount Martha	Mount Martha Activity Node	Mechanical
Mount Martha	Mount Martha South	Hand
Mount Martha	Pebble Cove	Hand
Safety Beach	Tassles Cove	Mechanical

Beach Cleaning Options Assessment

MORNINGTON PENINSULA Shire

Safety Beach	Safety Beach North	Mechanical
Safety Beach	Safety Beach	Mechanical
Safety Beach	Safety Beach South	Hand
Dromana	Dromana East	Hand
Dromana	Dromana Activity Node	Mechanical
Dromana	Dromana West	Hand
McCrae	McCrae East	Hand
McCrae	McCrae Activity Node	Mechanical
McCrae	McCrae West	Hand
Rosebud	Rosebud East	Hand
Rosebud	Rosebud Activity Node	Mechanical
Rosebud	Rosebud West	Hand
Capel Sound	Capel Sound	Hand
Tootgarook	Tootgarook	Hand
Rye	Rye	Hand
Blairgowrie	Blairgowrie East	Hand
Sorrento	Sullivan Bay	Hand
Sorrento	Sorrento Front	Hand
Portsea	Shelly	Hand
Portsea	Portsea Foreshore	Hand

Considerations

- Option does not consider the data collected throughout the Hand Cleaning Trial including community sentiment and litter volumes.
- Varied cleaning approach across individual beaches may present implementation challenges and community confusion.
- Provides ongoing monitoring opportunity to directly observe cleaning method impacts.
- Encourages natural coastal processes including deposition of wrack and vegetation growth in areas of greater environmental value.

Please note, a seaweed recycling trial is currently underway between some Port Phillip Bay Councils and private business. If successful, this innovation may reduce or prevent collected organic material from entering landfill. Vegetation including a Flora and Fauna Guarantee Act endangered listed species (Salsola Tragus Pontica) has been reported within some Port Phillip Bay beaches. Ground truthing and consultation with DEECA is required to better understand management responsibilities.

Cost Estimate

Each of the five beach cleaning options have been indicatively priced for internal and external service delivery models. Prices are to be treated as indicative and as Commercial in Confidence. Pricing details are outlined within **Confidential Attachment 8**.

Cost rankings are an indication of the least expensive (1/10) to most expensive (10/10) delivery option and model.

In-house Delivery Model: 8/10

Outsourced delivery Model: 4/10

Beach Cleaning Options Assessment

MORNINGTON PENINSULA Shire

Option 4 – Hybrid: 70% Hand Cleaning and 30% Mechanical Raking

This option is considered the most evidence-based which considers localised beach accessibility, recreational values, visitation rates, coastal setting, community sentiment and litter volumes from 1 July 2024 to 6 February 2025.

Under this option accessible areas which have high recreational values and modified coastal environments are recommended for mechanical raking. Areas with higher environmental values are recommended for hand cleaning. Borderline areas consider the reported litter load between 1 July 2024 and 6 February 2025.

This option results in approximately 22.5km of Port Phillip Bay beaches being hand cleaned and 10km of beaches being mechanically raked.

A copy of the methodology applied to determine beach values, community sentiment, litter loads and subsequent cleaning method is provided in **Attachment 7, Hybrid: 70% Hand Cleaning and 30% Mechanical Raking Values Analysis**.

Beach Cleaning Method

Township	Beach	Cleaning Method
Mount Eliza	Daveys Bay	Hand
Mount Eliza	Canadian Bay	Hand
Mount Eliza	Half Moon Bay	Hand
Mount Eliza	Ranelagh	Mechanical
Mount Eliza	Earimil	Hand
Mount Eliza	Moondah North	Hand
Mount Eliza	Moondah	Hand
Mount Eliza	Sunnyside North	Hand
Mount Eliza	Sunnyside South	Mechanical
Mornington	Mills East	Hand
Mornington	Mills West	Mechanical
Mornington	Shire Hall Beach	Mechanical
Mornington	Scouts	Mechanical
Mornington	Mothers	Mechanical
Mornington	Royal	Hand
Mornington	Fishermans	Mechanical
Mornington	Coral	Hand
Mornington	Fosters	Hand
Mornington	Fossil	Hand
Mount Martha	Dava	Hand
Mount Martha	Birdrock	Hand
Mount Martha	Mount Martha North	Hand
Mount Martha	Mount Martha Activity Node	Mechanical
Mount Martha	Mount Martha South	Hand
Mount Martha	Pebble Cove	Hand

Beach Cleaning Options Assessment

MORNINGTON PENINSULA Shire

Safety Beach	Tassels Cove	Mechanical
Safety Beach	Safety Beach North	Mechanical
Safety Beach	Safety Beach	Mechanical
Safety Beach	Safety Beach South	Mechanical
Dromana	Dromana East	Mechanical
Dromana	Dromana Activity Node	Mechanical
Dromana	Dromana West	Mechanical
McCrae	McCrae East	Hand
McCrae	McCrae Activity Node	Hand
McCrae	McCrae West	Hand
McCrae	Rosebud East	Hand
Rosebud	Rosebud Activity Node	Mechanical
Rosebud	Rosebud West	Hand
Capel Sound	Capel Sound	Hand
Tootgarook	Tootgarook	Hand
Rye	Rye	Hand
Blairgowrie	Blairgowrie East	Hand
Sorrento	Sullivan Bay	Hand
Sorrento	Sorrento Front	Hand
Portsea	Shelly	Hand
Portsea	Portsea Foreshore	Hand

Considerations

- This is informed by data collected throughout the Hand Cleaning Trial including community sentiment and litter volumes.
- Varied cleaning approach across individual beaches may present implementation challenges and community confusion.
- Provides ongoing monitoring opportunity to directly observe cleaning method impacts.
- Encourages natural coastal processes including deposition of wrack and vegetation growth in areas of greater environmental value.

Please note, a seaweed recycling trial is currently underway between some Port Phillip Bay Councils and private business. If successful, this innovation may reduce or prevent collected organic material from entering landfill. Vegetation including a Flora and Fauna Guarantee Act endangered listed species (Salsola Tragus Pontica) has been reported within some Port Phillip Bay beaches. Ground truthing and consultation with DEECA is required to better understand management responsibilities.

Cost Estimate

Each of the five beach cleaning options have been indicatively priced for internal and external service delivery models. Prices are to be treated as indicative and as Commercial in Confidence. Pricing details are outlined within **Confidential Attachment 8**.

Cost rankings are an indication of the least expensive (1/10) to most expensive (10/10) delivery option and model.

In-house Delivery Model: 8/10

Outsourced delivery Model: 4/10

Beach Cleaning Options Assessment

MORNINGTON PENINSULA Shire

Option 5 – Hybrid: 20% Hand Cleaning and 80% Mechanical Raking

This option aligns with the previous hybrid beach cleaning program delivered before the hand cleaning trial (pre-July 2024). Under this program approximately 80% of Port Phillip Bay beaches are mechanically raked and 20% hand cleaned. The method is determined based on if the beach is accessible by a mechanical rake. Where there is access for the mechanical rake, the beach is raked, where there is not adequate access, the beach is hand cleaned.

This option results in approximately 27km of Port Phillip Bay beaches being mechanically raked and 5.5km of beaches being hand cleaned.

Beach Cleaning Method

Township	Beach	Cleaning method
Mount Eliza	Daveys Bay	Hand
Mount Eliza	Canadian Bay	Mechanical
Mount Eliza	Half Moon Bay	Hand
Mount Eliza	Ranelagh	Mechanical
Mount Eliza	Earimil	Hand
Mount Eliza	Moondah	Hand
Mount Eliza	Sunnyside North	Hand
Mount Eliza	Sunnyside South	Mechanical
Mornington	Mills East	Mechanical
Mornington	Mills West	Mechanical
Mornington	Mothers	Mechanical
Mornington	Royal	Hand
Mornington	Fishermans	Mechanical
Mornington	Coral	Hand
Mornington	Fosters	Hand
Mornington	Fossil	Hand
Mount Martha	Dava	Hand
Mount Martha	Birdrock	Hand
Mount Martha	Mount Martha North	Mechanical
Mount Martha	Mount Martha South	Mechanical
Mount Martha	Pebble Cove	Hand
Safety Beach	Tassels Cove	Mechanical
Safety Beach	Safety Beach	Mechanical
Dromana	Dromana	Mechanical
McCrae	McCrae	Mechanical
Rosebud	Rosebud	Mechanical
Capel Sound	Capel Sound	Mechanical
Tootgarook	Tootgarook	Mechanical
Rye	Rye	Mechanical
Blairgowrie	Blairgowrie East	Mechanical

Beach Cleaning Options Assessment

MORNINGTON PENINSULA Shire

Sorrento	Sullivan Bay	Hand
Sorrento	Sorrento Front	Mechanical
Portsea	Shelly	Hand
Portsea	Portsea Foreshore	Hand

Considerations

- Return of groomed amenity to approximately 27km of beaches.
- Potential reputational risk in returning to this model after a review and trial process where collected data could inform improved practices.
- Seaweed and organic material may be required to be disposed of to landfill at cost and environmental impact.

Please note: a seaweed recycling trial is currently underway between some Port Phillip Bay Councils and private business. If successful, this innovation may reduce or prevent collected organic material from entering landfill. Vegetation including a Flora and Fauna Guarantee Act endangered listed species (Salsola Tragus Pontica) has been reported within some Port Phillip Bay beaches. Ground truthing and consultation with DEECA is required to better understand management responsibilities.

Cost Ranking

Each of the five beach cleaning options have been indicatively priced for internal and external service delivery models. Prices are to be treated as indicative and as Commercial in Confidence. Pricing details are outlined within **Confidential Attachment 8.**

Cost rankings are an indication of the least expensive (1/10) to most expensive (10/10) delivery option and model.

In-house Delivery Model: 8/10

Outsourced delivery Model: 7/10


Mornington Peninsula Shire
Beach Cleaning Option 1 – 100% Hand Cleaning
N
W
E
S
Legend
Hand Cleaning
0
2
4 km
Daveys Bay Beach
Canadian Bay Beach
Half Moon Bay Beach
Ranelagh Beach
Earimil Beach
Moondah Beach
Sunnyside North Beach
Sunnyside South Beach
Mills East Beach
Mills West Beach
Mothers Beach
Royal Beach
Fishermans Beach
Coral Beach
Fosters Beach
Fossil Beach
Dava Beach
Birdrock Beach
Mount Martha North Beach
Mount Martha South Beach
Pebble Cove Beach
Tassels Cove Beach
Safety Beach
Dromana Beach
McCrae Beach (East)
McCrae Beach (West)
Rosebud Beach
Capel Sound Beach
Tootgarook Beach
Rye Beach
Blairgowrie East Beach
Sullivan Bay Beach
Sorrento Front Beach
Portsea Foreshore Beach
Shelly Beach
Port Phillip
Bass Strait
Mount Eliza
Mornington
Mount Martha
Safety Beach
Dromana
Tuerong
Mooroodue
Rosebud
Capel Sound
Tootgarook
Rye
Blairgowrie
Sorrento
Portsea
Arthurs Seat
Red Hill
Red Hill South
Main Ridge
Boneo
McCrae
Merricks
Merricks North
Balnarring
Irrewarra
Uromana


Mornington Peninsula Shire
Beach Cleaning Option 2 – 100% Mechanical Raking
Legend
Machanical Cleaning
Not Mechanical Accessible
0 2 4 km
Port Phillip
Bass Strait
Daveys Bay Beach
Canadian Bay Beach
Half Moon Bay Beach
Ranelagh Beach
Earimil Beach
Moondah Beach
Sunnyside North Beach
Sunnyside South Beach
Mills East Beach
Mills West Beach
Mothers Beach
Royal Beach
Fishermans Beach
Coral Beach
Fosters Beach
Fossil Beach
Dava Beach
Birdrock Beach
Mount Martha North Beach
Mount Martha South Beach
Pebble Cove Beach
Tassels Cove Beach
Safety Beach
Dromana Beach
McCrae Beach (East)
McCrae Beach (West)
Rosebud Beach
Capel Sound Beach
Tootgarook Beach
Rye Beach
Blairgowrie East Beach
Sullivan Bay Beach
Sorrento Front Beach
Shelly Beach
Portsea Foreshore Beach


Mornington Peninsula Shire
Beach Cleaning Option 3 – Hybrid: 80% Hand Cleaning and 20% Mechanical Raking
Legend
Hand Cleaning
Mechanical Cleaning
0 2 4 km
Port Phillip
Bass Strait
Daveys Bay Beach
Canadian Bay Beach
Half Moon Bay Beach
Ranelagh Beach
Earimil Beach
Moondah Beach
Sunnyside North Beach
Sunnyside South Beach
Mills East Beach
Mills West Beach
Mothers Beach
Royal Beach
Fishermans Beach
Coral Beach
Fosters Beach
Fossil Beach
Dava Beach
Birdrock Beach
Mount Martha North Beach
Mount Martha South Beach
Pebble Cove Beach
Tassels Cove Beach
Safety Beach
Dromana Beach
McCrae Beach (East)
McCrae Beach (West)
Rosebud Beach
Capel Sound Beach
Tootgarook Beach
Rye Beach
Blairgowrie East Beach
Sullivan Bay Beach
Sorrento Front Beach
Shelly Beach
Portsea Foreshore Beach


Mornington Peninsula Shire
Beach Cleaning Option 4 – Hybrid: 70% Hand Cleaning and 30% Mechanical Raking
N
W
E
S
Legend
Hand Cleaning
Mechanical Cleaning
0
2
4 km
Port Phillip
Bass Strait
Daveys Bay Beach
Canadian Bay Beach
Half Moon Bay Beach
Ranelagh Beach
Earimil Beach
Moondah Beach
Sunnyside North Beach
Sunnyside South Beach
Mills East Beach
Mills West Beach
Mothers Beach
Royal Beach
Fishermans Beach
Coral Beach
Fosters Beach
Fossil Beach
Dava Beach
Birdrock Beach
Mount Martha North Beach
Mount Martha South Beach
Pebble Cove Beach
Tassels Cove Beach
Safety Beach
Dromana Beach
McCrae Beach (East)
McCrae Beach (West)
Rosebud Beach
Capel Sound Beach
Tootgarook Beach
Rye Beach
Blairgowrie East Beach
Sullivan Bay Beach
Sorrento Front Beach
Shelly Beach
Portsea Foreshore Beach
Mount Eliza
Mornington
Mount Martha
Moorooduc
Tuerong
Safety Beach
Dromana
Balnarring
Merricks North
Red Hill
Red Hill South
Merricks
Arthurs Seat
Main Ridge
McCrae
Rosebud
Capel Sound
Tootgarook
Boneo
Rye
Blairgowrie
Sorrento
Portsea
NEPEAN HWY
MORNINGTON PENINSULA FWY
POINT NEPEAN RD
MORNINGTON-TYABB RD
BENTONS RD
CRAIGIE RD
BUNGOWER RD
MOOROODUC HWY
TUERONG RD
OLD MOOROODUC RD
BALNARRING RD
MYERS RD
BITTERN-DROMANA RD
STANLEYS RD
ARTHURS SEAT RD
MELBOURNE RD
EASTBOURNE RD
BONEO RD
JETTY RD
BOUNDARY RD
WHITE HILL RD
MCILROYS RD
RED HILL RD
MAIN CREEK RD
MORNINGTON-FLINDERS RD
FRANKSTON-FLINDERS RD


Mornington Peninsula Shire
Beach Cleaning Option 5 – Hybrid: 20% Hand Cleaning and 80% Mechanical Raking
N
W
E
S
Legend
Hand Cleaning
Mechanical Cleaning
0
2
4 km
Daveys Bay Beach
Canadian Bay Beach
Half Moon Bay Beach
Ranelagh Beach
Earimil Beach
Moondah Beach
Sunnyside North Beach
Sunnyside South Beach
Mills East Beach
Mills West Beach
Mothers Beach
Royal Beach
Fishermans Beach
Coral Beach
Fosters Beach
Fossil Beach
Dava Beach
Birdrock Beach
Mount Martha North Beach
Mount Martha South Beach
Pebble Cove Beach
Tassels Cove Beach
Safety Beach
Dromana Beach
McCrae Beach (East)
McCrae Beach (West)
Rosebud Beach
Capel Sound Beach
Tootgarook Beach
Rye Beach
Blairgowrie East Beach
Sullivan Bay Beach
Sorrento Front Beach
Shelly Beach
Portsea Foreshore Beach
Port Phillip
Bass Strait
Mount Eliza
Mornington
Mount Martha
Safety Beach
Dromana
Tuerong
Mooroduc
Portsea
Sorrento
Blairgowrie
Rye
Tootgarook
Capel Sound
Rosebud
McCrae
Arthurs Seat
Main Ridge
Boneo
Red Hill
Red Hill South
Merricks
Merricks North
Balnarring

Beach Cleaning Option - Hybrid - 80% Hand and 20% Mechanical Cleaning

Township	Beach Name	Metres cleaned	Committee of Management	Dune Environmental Values (Reverse weighting)	Recreational Values	Visitation Rates	Accessibility	Total Values Score	Recommended Cleaning Method
Mount Eliza	Daveys Bay	188	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mount Eliza	Canadian Bay	432	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mount Eliza	Half Moon Bay	130	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mount Eliza	Ranelagh	484	Mornington Peninsula Shire Council	3	3	3	2	11	Mechanical
Mount Eliza	Earimil	266	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mount Eliza	Moondah North	1252	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mount Eliza	Moondah	270	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mount Eliza	Sunnyside North	269	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mount Eliza	Sunnyside South	287	Mornington Peninsula Shire Council	2	2	2	3	9	Hand
Mornington	Mills East	358	Mornington Peninsula Shire Council	2	2	2	1	7	Hand
Mornington	Mills West	362	Mornington Peninsula Shire Council	3	3	3	3	12	Mechanical
Mornington	Shire Hall Beach	211	Mornington Peninsula Shire Council	2	2	2	2	8	Hand
Mornington	Scouts	187	Mornington Peninsula Shire Council	3	2	2	2	9	Hand
Mornington	Mothers	160	Mornington Peninsula Shire Council	3	3	3	2	11	Mechanical
Mornington	Royal	204	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mornington	Fishermans	513	Mornington Peninsula Shire Council	1	3	3	2	9	Hand
Mornington	Coral	125	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mornington	Fosters	91	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mornington	Fossil	55	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mornington	Dava	311	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mount Eliza	Birdrock	294	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Mount Martha	Mount Martha North	1122	Mornington Peninsula Shire Council	2	3	3	2	10	Hand
Mount Martha	Mount Martha Activity Node	226	Mornington Peninsula Shire Council	2	3	3	3	11	Mechanical
Mount Martha	Mount Martha South	844	Mornington Peninsula Shire Council	1	2	3	2	8	Hand
Mount Martha	Pebble Cove	120	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Safety Beach	Tassles Cove	167	Mornington Peninsula Shire Council	2	3	3	2	10	Mechanical
Safety Beach	Safety Beach North	762	Mornington Peninsula Shire Council	3	3	3	2	11	Mechanical
Safety Beach	Safety Beach	751	Mornington Peninsula Shire Council	3	3	3	2	11	Mechanical
Safety Beach	Safety Beach South	1591	Mornington Peninsula Shire Council	2	2	3	2	9	Hand
Dromana	Dromana East	486	Dromana Foreshore COM Inc	2	2	3	2	9	Hand
Dromana	Dromana Activity Node	700	Dromana Foreshore COM Inc	3	3	3	3	12	Mechanical
Dromana	Dromana West	1693	Dromana Foreshore COM Inc	2	2	3	2	9	Hand
McCrae	McCrae East	545	Mornington Peninsula Shire Council	2	2	2	2	8	Hand
McCrae	McCrae Activity Node	618	Mornington Peninsula Shire Council	3	3	3	2	11	Mechanical
McCrae	McCrae West	537	Mornington Peninsula Shire Council	2	2	2	2	8	Hand
Rosebud	Rosebud East	1141	Mornington Peninsula Shire Council	1	2	2	3	8	Hand
Rosebud	Rosebud Activity Node	1770	Mornington Peninsula Shire Council	3	3	3	3	12	Mechanical
Rosebud	Rosebud West	753	Mornington Peninsula Shire Council	2	2	2	2	8	Hand
Capel Sound	Chinamens Creek	310	Mornington Peninsula Shire Council	2	2	2	3	9	Hand
Capel Sound	Capel Sound	608	Capel Sound CoM	1	2	3	2	8	Hand
Tootgarook	Tootgarook	2379	Capel Sound CoM	1	3	3	2	9	Hand
Rye	Rye	2413	Mornington Peninsula Shire Council	2	2	2	2	8	Hand
Blairgowrie	Blairgowrie East	3458	Whitecliffs to Camerons Bight COM Inc	2	2	3	2	9	Hand
Sorrento	Sullivan Bay	431	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Sorrento	Sorrento Front	1470	Mornington Peninsula Shire Council	2	2	3	3	10	Hand
Portsea	Shelly	868	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand
Portsea	Portsea Foreshore	490	Mornington Peninsula Shire Council	N/A - No possible access for Mechanical Cleaner					Hand

Proposed Beach Cleaning Program Totals	Meters	
Total	32,702	
Hand	26,702	82%
Mechanical	6,000	18%

Scoring Criteria

Dune Environmental Values (Reverse weighting)

3 Minimal Foredune Environmental Values with engineered structures and highly modified setting
2 Moderate Foredune Environmental Values with limited modification to natural environment and coastal setting
1 High Foredune Environmental Values with natural coastal setting and ecosystem values

Recreational Values

1 No or limited infrastructure (i.e. toilet block) within close proximity of beach
2 Some recreational values with known informal activites to occur at beach
3 High use recreational area directly adjacent a club (i.e. SLSC or Yacht) or known formal recreational activities

Visitation Rates

1 Low
2 Moderate
3 High

Accessibility

1 Difficult accessibility due to gradient or carparks greater than 50m away from access track
2 Moderately accessible with carparks within 50m, possibly some stairs or moderate gradient but with formal access points
3 Highly accessible with sealed beach access paths within 50m of carparks with limited gradient or known locations of Accessible Beach Matting

Beach Cleaning Option - Hybrid - 70% Hand Cleaning and 30% Mechanical Cleaning

				Accessibility	Individual beach characteristics			Survey results		Contractor Data			
Township	Beach	Length (m)	Committee of Management	Rake accessible	Recreational Values	Visitation Rates	Coastal Modification	Community support for hand cleaning	Values Score	Collected Litter as of 6 Feb 2025 (Litres)	Average Litter per meter (Litres)	Recommended Cleaning Method	Notes
Mount Eliza	Daveys Bay	188	Mornington Peninsula Shire Council	No	-	-	-	-	-	583.00	3.10	Hand	
Mount Eliza	Canadian Bay	432	Mornington Peninsula Shire Council	Yes	3	2	1	1	7	978.00	2.26	Hand	
Mount Eliza	Half Moon Bay	130	Mornington Peninsula Shire Council	No	-	-	-	-	-	450.00	3.46	Hand	
Mount Eliza	Ranelagh	484	Mornington Peninsula Shire Council	Yes	3	2	2	1	8	1410.00	2.91	Machine	
Mount Eliza	Earimil	266	Mornington Peninsula Shire Council	No	-	-	-	-	-	1182.00	4.44	Hand	
Mount Eliza	Moondah North	1,252	Mornington Peninsula Shire Council	No	-	-	-	-	-	3000.00	1.97	Hand	
Mount Eliza	Moondah	270	Mornington Peninsula Shire Council	No	-	-	-	-	-			Hand	
Mount Eliza	Sunnyside North	269	Mornington Peninsula Shire Council	No	-	-	-	-	-	1665.00	6.19	Hand	
Mount Eliza	Sunnyside South	287	Mornington Peninsula Shire Council	Yes	2	2	2	1	7	1315.00	4.58	Machine	
Mornington	Mills East	358	Mornington Peninsula Shire Council	Yes	1	3	1	1	6	1290.00	1.79	Hand	
Mornington	Mills West	362	Mornington Peninsula Shire Council	Yes	3	3	2	1	9			Machine	
Mornington	Shire Hall Beach	211	Mornington Peninsula Shire Council	Yes	2	3	2	1	8			Machine	
Mornington	Scouts	187	Mornington Peninsula Shire Council	Yes	2	3	2	1	8	2170	3.89	Machine	
Mornington	Mothers	160	Mornington Peninsula Shire Council	Yes	3	3	3	1	10			Machine	
Mornington	Royal	204	Mornington Peninsula Shire Council	No	-	-	-	-	-	1055.00	5.17	Hand	
Mornington	Fishermans	513	Mornington Peninsula Shire Council	Yes	2	3	2	1	8	1300.00	2.53	Machine	
Mornington	Coral	125	Mornington Peninsula Shire Council	No	-	-	-	-	-	540.00	4.32	Hand	
Mornington	Fosters	91	Mornington Peninsula Shire Council	No	-	-	-	-	-	0.00	0.00	Hand	No longer a beach. Area defined for cleaning is a path atop a seawall. Consider removal from activity
Mornington	Fossil	55	Mornington Peninsula Shire Council	No	-	-	-	-	-	271.00	4.93	Hand	
Mount Martha	Dava	311	Mornington Peninsula Shire Council	No	-	-	-	-	-	850.00	2.73	Hand	
Mount Martha	Birdrock	294	Mornington Peninsula Shire Council	No	-	-	-	-	-	895.00	3.04	Hand	
Mount Martha	Mount Martha North	1,122	Mornington Peninsula Shire Council	Yes	1	1	1	-1	2			Hand	
Mount Martha	Mount Martha Activity Node	226	Mornington Peninsula Shire Council	Yes	3	1	2	-1	5	6320.00	2.88	Machine	Recommend mechanical raking of recreational node considering localised visitation likely exceeding defined rates
Mount Martha	Mount Martha South	844	Mornington Peninsula Shire Council	Yes	2	1	1	-1	3			Hand	
Mount Martha	Pebble Cove	120	Mornington Peninsula Shire Council	No	-	-	-	-	-	895.00	7.46	Hand	
Safety Beach	Tassels Cove	167	Mornington Peninsula Shire Council	Yes	2	1	3	1	7	585.00	3.50	Machine	
Safety Beach	Safety Beach North	762	Mornington Peninsula Shire Council	Yes	3	1	3	1	8			Machine	
Safety Beach	Safety Beach	751	Mornington Peninsula Shire Council	Yes	3	1	3	1	8	6650.00	2.14	Machine	
Safety Beach	Safety Beach South	1,591	Mornington Peninsula Shire Council	Yes	1	1	1	1	4			Machine	Recommend mechanical raking for service continuity between Safety Beach and Dromana?
Dromana	Dromana East	486	Dromana Foreshore COM Inc	Yes	1	3	1	1	6			Machine	
Dromana	Dromana Activity Node	700	Dromana Foreshore COM Inc	Yes	3	3	3	1	10	6050.00	2.10	Machine	
Dromana	Dromana West	1,693	Dromana Foreshore COM Inc	Yes	2	3	2	1	8			Machine	
McCrae	McCrae East	545	Mornington Peninsula Shire Council	Yes	2	3	2	-1	6			Hand	
McCrae	McCrae Activity Node	618	Mornington Peninsula Shire Council	Yes	3	3	2	-1	7	1890.00	1.11	Hand	
McCrae	McCrae West	537	Mornington Peninsula Shire Council	Yes	1	3	1	-1	4			Hand	
McCrae	Rosebud East	1,141	Mornington Peninsula Shire Council	Yes	1	3	1	1	6			Hand	
Rosebud	Rosebud Activity Node	1,770	Mornington Peninsula Shire Council	Yes	3	3	2	1	9	4285.00	1.08	Machine	
Rosebud	Rosebud West	1,063	Mornington Peninsula Shire Council	Yes	1	3	1	1	6			Hand	
Capel Sound	Capel Sound	608	Capel Sound CoM	Yes	1	3	1	-1	4	2555.00	4.20	Hand	
Tootgarook	Tootgarook	2,379	Capel Sound CoM	Yes	1	3	1	-1	4	1405.00	0.59	Hand	
Rye	Rye	2,413	Mornington Peninsula Shire Council	Yes	2	3	2	-1	6	4265.00	1.77	Hand	
Blairgowrie	Blairgowrie East	3,458	Whitecliffs to Camerons Bight COM Inc	Yes	2	2	2	-1	5	2575.00	0.74	Hand	
Sorrento	Sullivan Bay	431	Mornington Peninsula Shire Council	No	-	-	-	-	-	209.00	0.48	Hand	
Sorrento	Sorrento Front	1,470	Mornington Peninsula Shire Council	Yes	2	3	1	-1	5	1540.00	1.05	Hand	
Portsea	Shelly	868	Mornington Peninsula Shire Council	No	-	-	-	-	-	805.00	0.93	Hand	
Portsea	Portsea Foreshore	490	Mornington Peninsula Shire Council	No	-	-	-	-	-	557.00	1.14	Hand	
	Total length cleaned (m):	**32,702**								**59540.00**	**1.82**	**Average litter volume per meter across all beaches.** Beaches with above average litter load per meter highlighted red	

Total hand cleaning length (m):	**22352.0**
Total mechanical cleaning length (m):	**10350.0**
Total hand cleaning length (%):	**68%**
Total mechanical cleaning length (%):	**32%**

Criteria

Recreational Values

1 No or limited infrastructure (i.e. toilet block) within close proximity of beach
2 Some recreational values with known informal activites to occur at beach
3 High use recreational area directly adjacent a club (i.e. SLSC or Yacht) or known formal recreational activities

Visitation Rates

1 Low = <20%
2 Moderate = 20-30%
3 High = >30%

Township	Visitation rate (%)	
Mount Eliza	-	Assumed 20-30% as an average between two neighbouring towns (Frankston 11%, Mornington 36%)
Mornington	36%	
Mount Martha	19%	
Safety Beach	18%	
Dromana	36%	
McCrae	-	Assumed >30% based on average of neighbouring towns
Rosebud	36%	
Capel Sound	-	Assumed >30% based on average of neighbouring towns
Tootgarook	-	Assumed >30% based on average of neighbouring towns
Rye	42%	
Blairgowrie	23%	
Sorrento	39%	
Portsea	39%	

Data source: Tourism Visitor Economy + Visitor Journey 2022, Mornington Peninsula Regional Tourism

Coastal modification

3 Highly modified beach environment with significant coastal infrstrucuture (i.e. sea wall) where coastal processes and dune values are restricted
2 Moderately modified beach environment with dispersed coastal infrastructure (i.e. groynes) where natural processes can occur
1 Little or no beach modification (i.e. beach with vegetated dune system) where natural processes occur

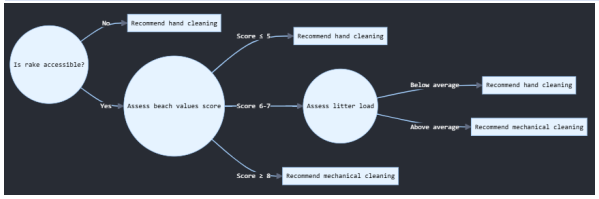
Community support for hand cleaning

1 Opposition to hand cleaning expressed via community survey
0 Mutual support expressed via community survey
-1 Support for hand cleaning expressed via community survey

Beach	Support Hand	Undecided	Oppose Hand	Difference
Mount Eliza	9		38	**-29**
Mornington	47	1	52	**-5**
Mount Martha	69	1	65	**4**
Safety Beach	64	6	77	**-13**
Dromana	52	6	74	**-22**
McCrae	48	2	37	**11**
Rosebud	46	5	52	**-6**
Capel Sound	41		35	**6**
Tootgarook	35		27	**8**
Rye	69		37	**32**
Blairgowrie	32	1	26	**6**
Sorrento	22		14	**8**
Portsea	14		5	**9**
General Feedback	44	2	20	**24**

Data source: Beach Cleaning Trial Online Survey (www.mornpen.vic.gov.au/beachcleaning) as of 17 February 2025

Determining recommended cleaning method




BEACH CLEANING EQUIPMENT.
Lifts the debris, not the sand.
BARBER SURF RAKE®

THE COMPLETE LINE OF BARBER SURF RAKES®

Model 600HD

At 1800 kilograms, the 600HD is H. Barber & Sons' largest Surf Rake®. It has been successfully used in a variety of municipal applications. Cleaning up to 3,2 hectares an hour with its 2,14 meter wide cleaning width, the 600HD has the greatest cleaning capacity of any beachcleaner. The 2,3 cubic meter hopper can lift up to 2000 kilograms of material and dump its contents hydraulically from a clearance height of 2,75 meters.

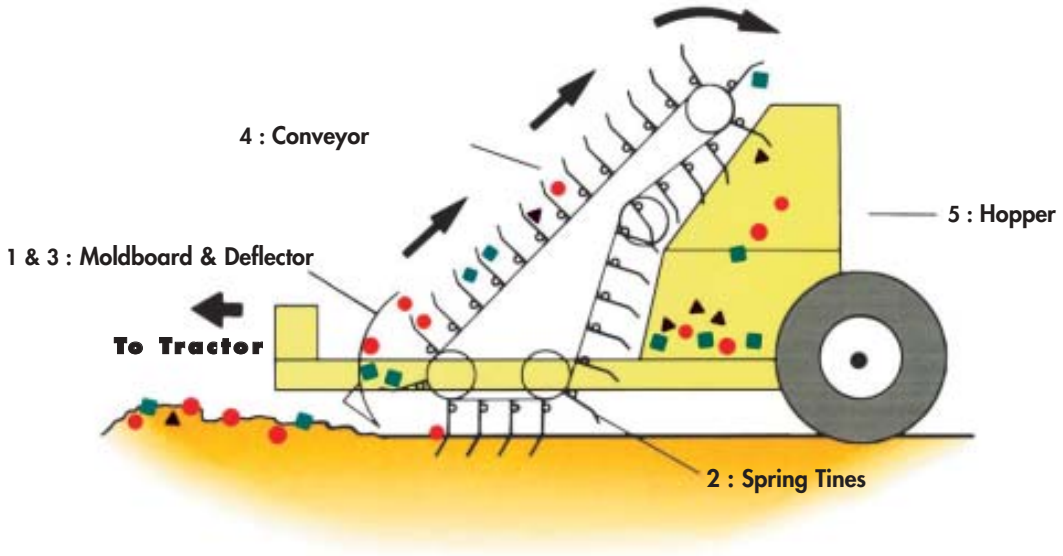
Model 400HD

The model 400HD is an excellent choice for resorts, hotels and lakeshore communities. At 1225 kilograms, it is H. Barber & Sons' moderate-size Surf Rake®. The 400HD is equipped with a 1,52 cubic meter hopper which will lift 1600 kilograms of debris to a dumping height of 2,75 meters. This mid-sized model uses the same heavy-duty conveyor and dump components as the 600HD. The 400HD can clean up to 1,6 hectares per hour.

Model 400

Similar to the model 400HD, the model 400 is the smallest Surf Rake®. It weighs 860 kilograms and can lift up to 1100 kilograms in its 0,75 cubic meter hopper. Its hydraulic dump discards material neatly on the ground. Within one hour, the model 400 can effectively clean up to 1,6 hectares.

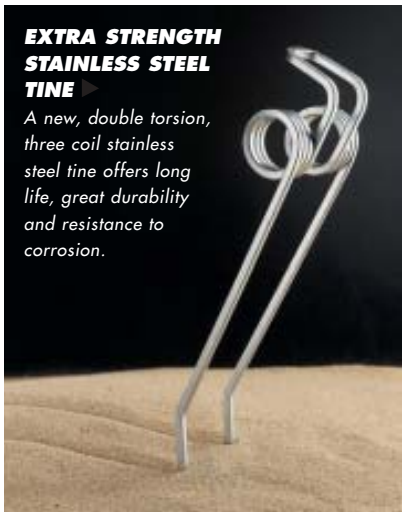
HOW IT WORKS



The Barber SURF RAKE® is a unique mechanical rake operated by one person from the seat of a towing tractor. It provides safe, fast and efficient beach cleaning. Here is how it works: **1.** The *moldboard* levels uneven areas in the sand. **2.** A 3/8" grid of *stainless steel spring tines* rake debris from the sand toward **3**. an adjustable *deflector* plate. As a result, refuse is deposited on **4.** the *conveyor* to **5.** the hydraulically raised *hopper*. The result: a clean, safe and well-manicured beach.

◀ THOROUGH CLEANING
Hundreds of stainless steel tines, mounted in offset rows, rake through the sand every second, removing the unwanted debris. Even the smallest objects such as glass, cigarette butts and pop-tops are captured by the SURF RAKE® and deposited in the hopper

◀ SANITIZING CONVEYOR BELT
The Barber SURF RAKE features a new Sanitizing Conveyor "S-Belt". This new belt design maximizes sand penetration and removal of extremely fine debris. Belt perforations, mounting tines underneath the conveyor and eliminating retaining bars now reduce the risk of residual sand removal. The new conveyor belt is easier to repair and keep clean and clear of debris.



EXTRA STRENGTH STAINLESS STEEL TINE ▶
A new, double torsion, three coil stainless steel tine offers long life, great durability and resistance to corrosion.

SPECIFICATIONS

MODELS	600HD	400HD	400
HYDRAULIC DRIVE	Completely sealed and protected by full flow filter. Large capacity spline mounted cast iron pump, hydraulic motor, flow control, and built-in overflow protection.	Completely sealed and protected by full flow filter. Large capacity spline mounted cast iron pump, hydraulic motor, flow control, and built-in overflow protection.	Completely sealed and protected by full flow filter. Large capacity spline mounted cast iron pump, hydraulic motor, flow control, and built-in overflow protection.
CONVEYOR	Of bar flight type with chain and sprocket drive, covered with continuous 1,8 m wide NBR belt, which will not stretch or corrode.	Of bar flight type with chain and sprocket drive, covered with continuous 1,2 m wide NBR belt, which will not stretch or corrode.	Of bar flight type with chain and sprocket drive, covered with continuous 1,2 m wide NBR belt, which will not stretch or corrode.
TINES	700 Stainless steel tines in 1,8 m rows	370 Stainless steel tines in 1,2 m rows	340 Stainless steel tines in 1,2 m rows
HOPPER	2,3 cubic meter (2000 kg cap.) Hot dip galvanized	1,52 cubic meter (1600 kg cap.) Hot dip galvanized	0,75 cubic meter (1100 kg cap.) Hot dip galvanized
DUMP HEIGHT	2,75 meters	2,75 meters	Ground
TIRES	91.4 x 34.3 x 38.1 cm high flotatation design	78.7 x 34.3 x 38.1 cm high flotation design	78.7 x 34.3 x 38.1 cm high flotation design
MOLDBOARD	A moldboard deflector plate is positioned at the front of the machine to level the beach before cleaning.	A moldboard deflector plate is positioned at the front of the machine to level the beach before cleaning.	A moldboard deflector plate is positioned at the front of the machine to level the beach before cleaning.
OPERATING SPEEDS	1 to 25 kilometers per hour	1 to 25 kilometeres per hour	1 to 25 kilometers per hour
CLEANING WIDTH	2,14 m (1,8 m of deep cleaning)	1,8 m (1,2 m of deep cleaning)	1,8 m (1,2 m of deep cleaning)
CLEANING DEPTH	Adjustable to 15 cm	Adjustable to 15 cm	Adjustable to 15 cm
DIMENSIONS	Height: 2,3 m Length: 4,0 m Width: 2,3 m	Height: 2,2 m Length: 3,6 m Width: 2,3 m	Height: 1,4 m Length: 3,0 m Width: 2,3 m
WEIGHT	Approximately 1800 kg	Approximately 1225 kg	Approximately 860 kg
PAINT	Dupont IMRON® Polyurethane enamel	Dupont IMRON® Polyurethane enamel	Dupont IMRON® Polyurethane enamel
FINISHING ATTACHMENT	To smooth the sand and eliminate tire marks for a minimum 2,74 m wide path - optional.	To smooth the sand and eliminate tire marks for a minimum 2,74 m wide path - optional.	To smooth the sand and eliminate tire marks for a minimum 2,74 m wide path - optional.
GALVANIZATION	All frame and body parts Hot Dip Galvanized - optional.	All frame and body parts Hot Dip Galvanized - optional.	All frame and body parts Hot Dip Galvanized - optional.
PERFORMANCE	Cleans up to 32,000 m^2/h	Cleans up to 20,000 m^2/h	Cleans up to 16,000 m^2/h
TRACTOR REQUIREMENTS	60 PTO horsepower 4-wheel drive agricultural type tractor with 76 cm rear wheels.	35 PTO horsepower 4-wheel drive agricultural type tractor with 71 cm rear wheels.	30 PTO horsepower 4-wheel drive agricultural type tractor with 71 cm rear wheels.
DEBRIS REMOVED	540 RPM rear PTO, 3 point hitch, and 1 remote hydraulic valve (minimum), up to 3 with options. This is a general guideline. Larger or smaller tractors may be used depending on beach conditions.		
	Broken glass, plastic, syringes, cigarette butts, pop-tops, straws, cans, tar balls, stones 1 cm to 15 cm in diameter, sea grass, sea weed, fish, small pieces of wood.		
	The manufacturer reserves the right to change the specifications without notice and without incurring obligation. The information contained herein is from data available at the time of printing.		

Since its establishment in 1966, H. Barber & Sons has been committed to the preservation of beautiful beaches and the environment. Its product, the Barber Surf Rake®, is the highest quality, most efficient beach cleaning equipment available. With its ability to clean a variety of beach conditions, the Surf Rake® has earned H. Barber & Sons the distinction of being the leader in beach cleaning technology and the largest manufacturer of beach cleaners in the world.

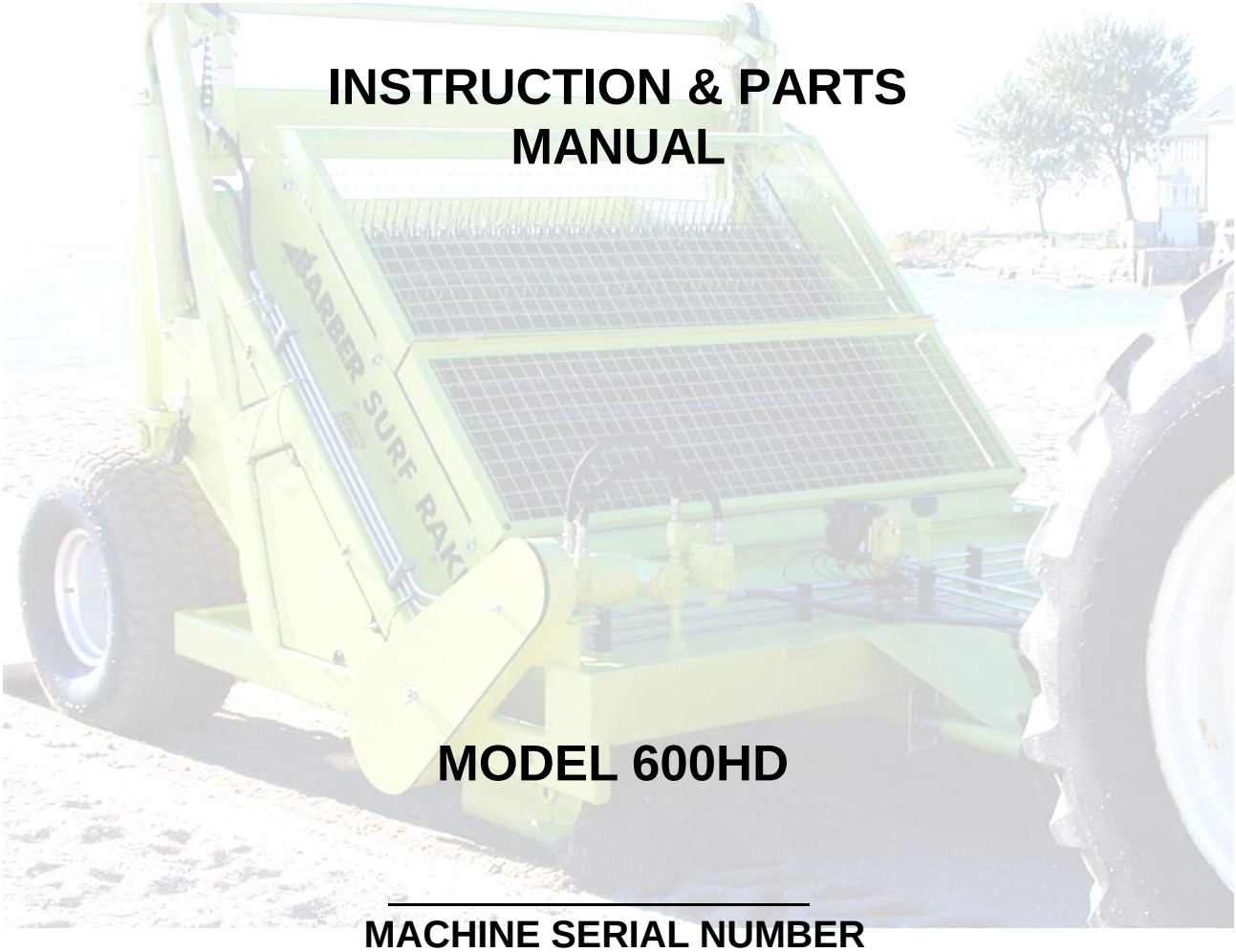
The corporate headquarters and manufacturing plant of H. Barber & Sons is based in Connecticut. Sales and support services are handled through a worldwide dealer network. Throughout the company, quality production, responsive service and customer support are of utmost importance.

Barber Surf Rakes® are maintaining beautiful beaches both domestically and internationally. Regardless of where a customer may be located, H. Barber & Sons promises expedient delivery of all parts and machinery. It is part of the company-wide commitment to excellent service which customers have come to expect from H. Barber & Sons.

The Barber Surf Rake® is the beach cleaner of choice for restoring the appearance of public and private beaches. The most widely cited reason for choosing the Surf Rake® is its efficiency. It is designed with a unique raking system that quickly and thoroughly cleans an entire beach, including heavy debris areas along the water's edge. It is also the only beach cleaner that is equally effective in wet and dry sand at speeds up to 25 kilometers per hour. The ultimate result: your beaches are returned to a cleaner, more beautiful condition.

Users find the Surf Rake® dependable, easy to operate and maintain. By eliminating the need for hand labor, it actually reduces time and expense, resulting in an extremely cost-efficient method as well. And with increasing concern for the environment, the Barber Surf Rake® is a viable cleaning solution for today.

SURF RAKE®



INSTRUCTION & PARTS MANUAL

MODEL 600HD

MACHINE SERIAL NUMBER

CATALOG 600HDS617800221

61780 0221

IMPORTANT SAFETY INFORMATION
FOR SURF RAKE® OWNERS, OPERATOR EMPLOYERS
AND OPERATORS

1. Do not allow individuals to operate the Surf Rake® without first receiving personalized training and ensuring that they have read this manual.

2. Before each operation of the Surf Rake®, make a careful visual inspection of the machine. Do not operate if you observe damaged or missing parts, missing guards, excessive wear or unusual noise or vibration during startup.

3. Never allow a bystander to approach the operating Surf Rake®, whether or not it is moving forward. Stop the Surf Rake®, unless that individual is qualified and is present for the specific purpose of assisting in the operation, maintenance or repair of the Surf Rake®.

4. Never allow a bystander to approach the operating Surf Rake® and stand under or near the hopper while it is being raised or lowered.

5. Do not attempt to clear large obstacles from the path of the Surf Rake® by pushing them with the tractor or the Surf Rake®. Stop the Surf Rake®, turn it off and manually remove obstacles. Seek assistance if you cannot do so alone.

6. Never attempt to clear a jam by placing hands or any part of the body into or near the machinery which has not been completely shut down. A jammed conveyor component can immediately jump into motion and cause serious injury to hands or other body parts in immediate contact with the components if the system is under hydraulic pressure.

7. Stand clear of the Surf Rake® when it is being set down on its foot stands or jack stand, to prevent injury.

8. Follow OSHA regulations regarding hydraulic fluid, fire safety, guarding and if applicable, lock-out/tag-out procedures.

9. Before conducting any repair or maintenance on the Surf Rake®, ensure that the hydraulic pump is OFF, not just in neutral, and examine the machine carefully to assure that:
   (a) No hydraulic hoses remain pressurized.
   (b) No parts of the machine are suspended without being mechanically blocked or supported.
   (c) All sources of power have been locked in the OFF position and tagged.

10. Never allow one person to operate the controls of the Surf Rake® while another has any part of their body in or near a pinch point or machinery element from which a guard has been removed.

11. Stand clear of hydraulic hoses and fittings while the Surf Rake® is in operation. A sudden fitting or hose failure can inflict serious injury.

12. Do not operate the Surf Rake® on a steep incline, extremely irregular surface or unstable surface. The tractor and/or the Surf Rake® can capsize and cause serious injury or death to the operator or nearby persons.

13. Never modify any part of the Surf Rake® without prior approval, in writing, from the manufacturer.

14. Never replace any components of the Surf Rake® with one which is not manufactured by H. Barber & Sons, Inc., or listed in this manual as a proper replacement part.

61780 0221

TABLE OF CONTENTS
SURF RAKE® MODEL 600HD

When Ordering Parts, state the:

1. **Model and serial number of your Surf Rake®.**
2. **Part number, description and page number.**
3. **Shipping and billing address.**
4. **Method by which shipment is to be made.**
5. **Full name of consignee.**
6. **Catalog number of this parts book (found in bottom left hand corner)**

61780 0221

BARBER SURF RAKE® MODEL 600HD

SECTION 1 - SURF RAKE® COMPONENTS

This instruction manual describes the different systems and components that make up the Surf Rake®. This manual includes a maintenance, lubrication and parts ordering section. It is important that anyone operating the Surf Rake® should read and understand this manual prior to operating the machine. All safety procedures must be observed. Step-by-step instructions are also included to facilitate installation. The following section describes the different systems and features of the Surf Rake®.

MECHANICAL COMPONENTS

CONVEYOR The conveyor belt rakes the material off of the beach, separates the debris from the sand, elevates the debris up the conveyor and deposits the debris into the hopper. The speed of the conveyor is adjustable. Proper belt tension is essential for long life of the conveyor belt chains and the conveyor belt drive components which include rollers, sprockets and bearings. If the conveyor is loose, it will cause the Surf Rake® to pick up less material and will hasten the wear of the Surf Rake's® drive and conveyor components.

MOLDBOARD The moldboard is located behind the reservoir and in front of the conveyor. It allows debris in the path of the Surf Rake® to pass under it and into the adjacent area between the moldboard and conveyor belt, where the conveyor separates the sand and lifts the debris using the back/hidden side of the moldboard. The proper height adjustment of the moldboard is important for picking up the maximum amount of debris per pass.

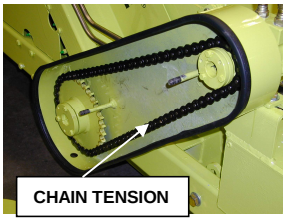
DRIVE MECHANISM The conveyor belt is supported by sets of sprockets and rollers on each side of the frame. The bottom front shaft is the driving shaft or main shaft. The pair of sprockets on the main shaft and the pair on the top shaft keep the conveyor belt tracking straight by guiding the chains located on each side of the conveyor belt. For the conveyor belt to track correctly, the tension must be the same on each side of the conveyor belt. The top shaft moves upward to achieve correct tracking tension. Take up bolts located under the top shaft on each side of the frame are tightened to raise the top shaft. It is very important to evenly adjust both sides of the conveyor belt to the same tension by tightening these take up bolts. There are four 3 ½" diameter metal roller assemblies that support the weight of the conveyor and the debris that is being lifted up to the hopper.
There are four 8" diameter idler roller assemblies that create a smooth path of support for the conveyor to rotate on.

SKID SHOES The skid shoes add support under each side of the conveyor belt as it is being elevated up to the top shaft. The skid shoes are attached to each side of the frame on the underside of the conveyor belt. The chain should not touch the skid shoes. If they are touching, the conveyor belt needs to be adjusted. The skid shoes should be inspected periodically for wear and changed as a pair when they wear down to 1/8" thickness.

SIDE GUARDS/STONE GUARDS The side guards and stone guard flaps are located on each side of the conveyor belt. Together they guide debris up to the top of the conveyor belt and into the bucket. They keep debris away from the conveyor belt chain and drive sprockets. The side guards are fastened to the side frame with three bolts. The stone guard flaps are fastened to the side guards with bolts which are loosened to adjust the flaps down toward the belt as the flaps wear. There should be no gap between the stone flap and the belt. This should be adjusted every season or replaced when worn. This protects the conveyor belt from jams.

TOP SHIELD The top shield acts as a guide that prevents light weight objects from being blown out of the

side of the moving Surf Rake®. The top shield is also a safety device that prevents incidental contact with the moving conveyor belt assembly. It is fastened to the side guard with four bolts and is taken off to adjust the stone guard flaps.



CHAIN CASE The conveyor belt is driven by the hydraulic motor which transfers power to the drive chain and the drive sprockets located inside the chain case.
Drive chain should be adjusted so that there is approximately 1/4"(6.35mm) slack but no more than 1"(25.4mm) slack midpoint between the sprockets. Adjustment is made by loosening the two bolts that fasten the motor mount to the front tank motor bracket and tightening the adjusting bolt, which will move the motor and attached front sprocket assembly forward. Replace chain when adequate adjustment can no longer be achieved. Note: Chain tension should be ¼" minimum (6.35 mm) and 1" maximum (25.4 mm).

BUCKET The bucket catches the debris the conveyor belt picks up. When full, the bucket is raised and then tripped, pivoting on the lift arm and bucket bearings. There is a bucket stop on the left side, which stops the bucket at its dumping position and prevents the bucket from spinning and over turning. There Is a block on either side of the bucket which nests into the angled guides on each side of the bucket on the frame. When the bucket is in its correct position, the blocks should be to the bottom of the guides and slightly off the frame.

BUCKET LIFTING MECHANISM The lift arms attach the bucket to the frame. They are elevated hydraulically by the two larger lifting cylinders. They lift the bucket back/away from the frame for emptying the collected debris. The lift arms are supported by a sleeve bearing located at the top of the side frame on each side of the Surf Rake®. The grease port on top of the side frames should be greased weekly to prevent the sleeve bearings from freezing up.

BUCKET TRIPPING MECHANISM After the bucket is raised, it is tripped to empty the collected debris. It is tripped by the smaller pair of dumping cylinders, dumping sprockets and turnbuckle assemblies. After the bucket is tripped and emptied of debris, it must be un-tripped before it is lowered.

BUCKET GUIDES The guides are located on the frame on either side of the bucket and should be used to position the bucket correctly by tightening or loosening the dump chains. If the bucket chain assemblies are loose when they are down, the turnbuckles should be tightened until the chain assemblies are both taut and lifting the bucket blocks slightly off of the frame. This adjustment should be done when the bucket is empty. If the bucket blocks are not nested near the bottom of the guides, the dump chains are too tight. The turnbuckles must be loosened until the chain assemblies are both taut and lifting the bucket blocks slightly off of the frame.

HUB ASSEMBLY, WHEEL AND TIRE The two hub assemblies are attached to the frame by the spindle. The hub rides on two races and bearings that can be adjusted as they wear with the adjusting castle nut and pin. There is a refillable grease reservoir on each hub that maintains pressure to the bearings.
Torque the lugs on the wheel and tire assemblies to 95 ft/lbs. The tires are inflated to 18 PSI. It is important that both tires be the same pressure.

AUTOMATIC FINISHER (OPTION) The grooming finisher is attached to the rear of the Surf Rake® to smooth the clean sand and eliminate tire marks left by the tractor and beach cleaner.

HYDRAULIC COMPONENTS (CONVEYOR)

The conveyor hydraulic system is separate from the bucket or finisher hydraulic systems. It is a closed system made of the following components:
A reservoir of hydraulic fluid on the front of the Surf Rake®

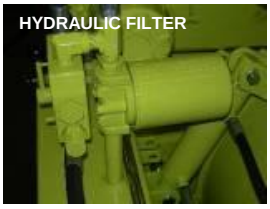
A hydraulic pump, attached to and powered by the tractor PTO, which circulates the hydraulic fluid
The flow control, which regulates the flow of the hydraulic fluid through the motor
The conveyor belt motor that turns the chain case drive chain and sprockets and turns the conveyor
The hydraulic fluid is then filtered and returns back to the Surf Rake® reservoir

HYDRAULIC RESERVOIR The reservoir tank is located across the front of the frame. It supplies hydraulic fluid to the hydraulic pump and conveyor belt drive motor. It has a magnetic drain on the bottom for changing the hydraulic fluid. There is a sight gage for inspecting hydraulic fluid level on the side of the tank.

BREATHER CAP The breather cap on top of the reservoir is pressurized to keep out contaminants and keep fumes from entering the atmosphere. It has a 10 micron rating and has a 5 PSI relief valve setting.

HYDRAULIC PUMP The hydraulic pump should be placed over the PTO spline shaft at the rear of the tractor. Slide the pump as far forward as possible. The pump bracket can be mounted directly to the top link of the three point hitch. Adjust arms to keep the pump upright and as close as possible to the tractor. If this bracket cannot be attached, use the bracket with mounting chain. To secure the pump, secure the chain to a rigid surface of the tractor, preferably to the pin of the upper three-point hitch arm bracket, so that the torque arm of the pump is positioned up. The PTO spline will turn clockwise and the resulting torque will tend to turn the pump clockwise also. Minimize the length of the safety chain. There is a removable link that attaches the hook to the chain. This link may be repositioned along the chain to minimize the chain length and maintain the upright orientation of the pump. It may be necessary to reduce the chain length to achieve proper orientation of the pump. It may also be necessary to reposition the pump arm to fit up with the tractor. Be careful not to crimp or twist the hoses. If the 1"(2.54cm) suction hose is twisted, the hose clamp on the pump end of the hose can be loosened, the hose turned to the desired position, and the clamp re-tightened.

FLOW CONTROL The flow control is located between the pump and conveyor belt motor. It raises or lowers the speed of the conveyor belt motor by regulating the flow of hydraulic fluid circulated by the pump. The control arm is on the side. When the control arm is in the up position, hydraulic fluid is completely restricted, preventing the motor and conveyor belt from turning. As the control arm is turned down, the valve inside is opened up and the motor and conveyor belt increase speed. There is a built-in, preset, pressure relief valve that protects the conveyor belt assembly. If an oversized object stops the rotation of the conveyor belt, the valve will open, relieving pressure from the conveyor motor and bypass the hydraulic fluid back to the reservoir.



HYDRAULIC FILTER The hydraulic fluid is filtered and returned to the reservoir tank through the canister filter.

HYDRAULIC CONVEYOR BELT MOTOR The hydraulic motor drives the conveyor belt and is located next to the chain case. The intake hose comes from the flow control and the outlet hose returns to the reservoir. The motor does not run in reverse. There is a take up bolt and lock down nut at the base of the motor that moves the motor to adjust and tighten the chain case drive chain when the chain wears.

HYDRAULIC COMPONENTS (BUCKET AND FINISHER)

The tractor's remote valve hydraulic system is used to control both the bucket hydraulics and the hydraulic moldboard if equipped.
Each tractor remote valve spool has a pair (2) of quick disconnects that are next to each other, positioned either vertically or horizontally depending on brand of tractor, and independently operated from adjacent spools. One spool (2 quick disconnect outlets) is needed for the hose for the bucket raising and lowering operation and tripping and returning operations. Only one quick connect is utilized. No other hose or implement can be plugged into the unused quick connect. If a hydraulic moldboard option is added, an

61780 0221

additional spool or second remote is required to raise and lower the moldboard. These are the only double acting cylinders on the Surf Rake® and use both the upper and lower quick disconnects of a spool. It is not possible to share two of these operations on the same spool or set of remote valves. When connecting to each spool use the upper remote and leave the lower remote empty.

BUCKET LIFTING CYLINDERS The two large cylinders raise the lift arms and bucket to its dumping position.

BUCKET TRIPPING CYLINDERS After the hopper is raised and positioned, two small cylinders are used to trip the hopper and remove the debris. The dump chains, sprockets and small cylinders trip the bucket after it is raised. The turnbuckles are the mechanism used to adjust the position of the bucket. It is very important that the turnbuckles be adjusted evenly to distribute or share the lifting load of the bucket. When the bucket is being raised or when the bucket is down in the cleaning position, the dump chains should be taut on both sides.

FINISHER CYLINDER (OPTION) The finisher's single acting cylinder is operated hydraulically through a hose connected to one of the tractor's quick disconnecting remote valves. The finisher cylinder lowers the finisher onto the beach to create a smooth pathway behind the Surf Rake®. The finisher cylinder raises the finisher for transporting to and from either a debris dump site or dumpster and for transporting the Surf Rake® to a storage site.

AUTOMATIC FINISHER (OPTION) The automatic finisher is integrated into the conveyor belt hydraulics. When the PTO on the tractor is engaged, the conveyor belt is activated and the finisher is lowered. A spring mechanism is used to raise the finisher when the PTO is disengaged.

HYDRAULIC MOLDBOARD (OPTION) The hydraulic moldboard is moved up and down by two double acting cylinders. This option requires a set of remote valves on the tractor. The two hoses connect to one rear remote valve.

ELECTRONIC COMPONENTS (OPTIONS)

Electrical diagrams for all component options are located at the end of this manual.

POWER CABLE The towing tractor supplies the Surf Rake® and all its electronic components with power through a seven conductor cable. The cable runs from the tractor to the junction box on the Surf Rake®. Wiring diagrams are located at the back of this manual – refer to the table of contents. **See Picture.**


POWER CABLE

LIGHTING (OPTION) The lighting circuit is comprised of a two piece molded electrical harness that connects the brake lights, tail lights, directional lights, marker lights, safety lights and running lights of the Surf Rake®'s light bar to the towing vehicle's lighting system. The Electrical Plug is a 7-pin configuration. Wiring diagrams are at Section 6-18.

HYDRAULIC MULTIPLIER (OPTION) When the tractor needs an additional valve(s) to operate the bucket or the finisher, a hydraulic multiplier can be used. Connect the multiplier's solenoid body to the tractor's quick disconnect remote outlet. Attach the multiplier's push button handle onto the tractor remote's handle and plug into the tractor's electrical power source. This electronic solenoid activated valve spits an existing line from the tractor, allowing you to choose which cylinders you want to activate by pressing the button on the handle. A one to two line multiplier and a one to three line multiplier are available. **See Picture.**

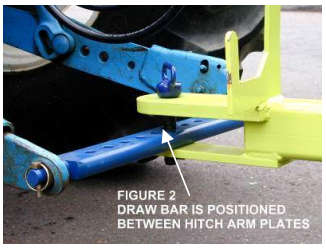

HYDRAULIC MULTIPLIER

BARBER SURF RAKE® MODEL 600HD

SECTION 2 - ATTACHING TO TOWING VEHICLE

ATTACH

DRAWBAR Install the supplied draw bar onto the tractor's lower 3-point hitch arms, securing it on each end with the supplied hitch bar snap pins.



FRONT HITCH To attach, back the tractor up to the Surf Rake® and centrally locate the draw bar between the upper and lower plates of the hitch. Drop hitch pin through and insert cotter pin into bottom of hitch pin. **See Figure 2.**

DRAFT CONTROL Set the draft control on the tractor so the bottom edge of the moldboard may be lowered at least 4 inches (10.16 cm) below ground level. The three-point hitch lift arms on the tractor may need to be adjusted so that you have the necessary range of movement. It is recommended that sway bars be used on the arms of the three-point hitch. **The draw bar must be 4-5 inches from the ground at its lowest point.**

HYDRAULIC PUMP The tractor PTO guard must first be removed in order to correctly install the pump. The hydraulic pump should be placed over the PTO spline at the rear of the tractor. Slide the pump as far forward on the PTO spline shaft as possible. The pump bracket is attached to the pump. Attach the bracket to the top pin of the three point assembly. Keep the pump as close to the tractor as possible. If the arm cannot be attached, use the attaching chain. The pump chain is located in the spare parts box. Secure the chain to a rigid surface of the tractor, preferably to the pin of the upper three-point hitch arm bracket, so that the torque arm of the pump is positioned up. The PTO spline will turn clockwise and the resulting torque will tend to turn the pump clockwise also. ***MINIMIZE THE LENGTH OF THE SAFETY CHAIN.*** There is a removable link that attaches the hook to the chain. This link may be repositioned along the chain to minimize the chain length and maintain the upright orientation of the pump. It may be necessary to reduce the chain length to achieve proper orientation of the pump. Be careful not to crimp or twist the hoses. If the 1"(2.54cm) suction hose is twisted, the clamp on the pump end of the hose can be loosened, the hose turned to the desired position, and the clamp re-tightened. The supplied bracket is adjustable for a variety of tractors.

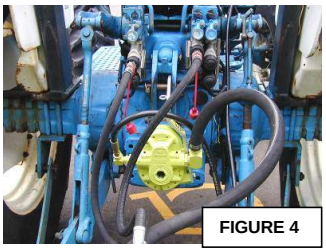
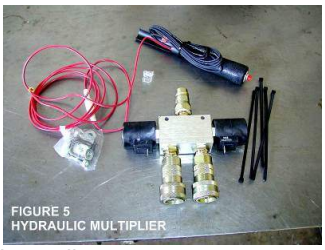


FIGURE 4

There is one hose at the front of the Surf Rake® that operates the bucket. **See Figure 4.**
If equipped, can add an additional hose for the hydraulic moldboard.

HYDRAULICS FOR BUCKET RAISE Remove the protective covers (545HD-13) from the bucket hose. Attach the hose, which is equipped with quick disconnect couplers into your tractor's quick disconnect outlets. This hose must be connected to separate spools for independent operation. **DO NOT ACTIVATE TRIP UNTIL THE BUCKET HAS BEEN RAISED.**



HYDRAULIC MULTIPLIER Depending on which options are purchased for the SURF RAKE®, the towing tractor may require more than one hydraulic (spool) valve. If more than one valve is required, a “hydraulic multiplier” can be installed to split one valve into two or three circuits. **See Figure 5.**

JACK POSITIONING Lift the machine up with the three-point hitch, remove the jack stand pin and turn the jack stand back, not forward, into its neutral position (or remove jack stand if desired). Replace jack stand

pin. Fold the jack stand arm up to keep it away from the working area as shown in Figure 6. The Surf Rake® is now ready for operation. **See Figure 6.**


FIGURE 6

TRACTOR ENGINE While in operation, the tractor engine should be kept at an RPM that will result in a **540-RPM PTO** speed. This should be displayed on the tractor's tachometer. The speed of the tractor and the PTO speed will later be adjusted to suit individual beaches.

FLOW CONTROL The flow control valve lever should be adjusted once the PTO on the tractor is engaged. The pump will deliver oil to the flow control valve. The lever on the valve regulates the conveyor belt speed. Adjust the belt speed as described in the operation section in this manual (Belt speed of **14 RPM** is a good initial setting). The valve is also equipped with an overflow relief, factory set to **2000 PSI (13,788 kPa)**, which serves as a safety device should the belt mechanism jam. **See Figure 7.**


FIGURE 7
FLOW CONTROL

BARBER SURF RAKE® MODEL 600HD

SECTION 3 – OPERATING THE SURF RAKE®

OPERATION

Do not allow individuals to operate the Surf Rake® without first receiving personalized training and ensuring that they have read this manual.

Before each operation of the Surf Rake®, make a careful visual inspection of the machine. Do not operate if you observe damaged or missing parts, missing guards, excessive wear or unusual noise or vibration during startup.

Stand clear of hydraulic hoses and fittings while the Surf Rake® is in operation. A sudden fitting or hose failure can inflict serious injury.

To prevent the tractor and/or Surf Rake® from capsizing and causing serious injury or death, do not operate the Surf Rake® on a steep incline or unstable surface.

Do not allow a bystander to approach the Surf Rake® unless that individual is qualified and is present to assist in the operation or repair of the machine. Never allow one person to operate the controls of the Surf Rake® while another has any part of their body in or near a pinch point.

Under no circumstances should a bystander stand under or near the hopper while it is being raised or lowered.

To prevent injury, do not attempt to clear large obstacles by pushing them with the tractor or Surf Rake®.

Never attempt to clear a jam by placing hands or any part of the body into or near the machinery that has not been completely shut down. A jammed conveyor component can immediately jump into motion and cause serious injury to hands or other body parts in immediate contact with the components if the system is under hydraulic pressure.

START UP Pull the Surf Rake® into position on the beach area to be cleaned. Put the tractor in gear. Engage the PTO and adjust the engine to a **540-RPM PTO** setting. With the tractor moving and the belt turning, lower the Surf Rake® into the sand. The Surf Rake® can be towed along the beach at speeds from one to fifteen miles per hour (1.6km/hr to 24 km/hr). Speed is dependent on the contour of the beach and the volume of debris to be removed. On a very uneven beach or on a beach that is heavily littered, travel-cleaning speeds of three to four miles per hour should be maintained. On a level beach that is lightly littered, higher speeds can be attained. The operator must be alert for large objects or obstructions on the beach. If a significant obstruction is encountered, the Surf Rake® must be raised clear of the obstruction. If it is not possible to safely raise the Surf Rake® clear of the obstruction, stop the machine, turn it off, and manually remove the obstacle.
Seek assistance if you cannot do so alone.


FIGURE 8
MATERIAL CARRIED
IN FRONT OF MOLDBOARD

UNDER NO CIRCUMSTANCES SHOULD THE SURF RAKE® REMOVE MORE THAN A NEGLIGIBLE AMOUNT OF SAND.

If it is picking up too much sand, refer to the operating hints section of this manual. The machine should be raised and lowered while cleaning to follow the general contour of the beach. To achieve a consistently clean beach, some material should be carried in front of the moldboard deflector unit. This allows the tines to penetrate evenly for the full width of the machine, thus leveling the beach while utilizing the Surf Rake® to its maximum potential.

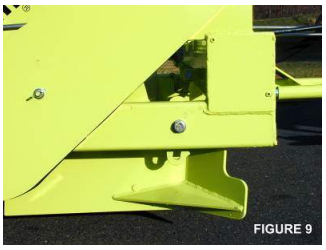


FIGURE 9

MOLDBOARD ADJUSTMENT Proper adjustment of the moldboard is critical to achieving the maximum potential from your Surf Rake®. The distance from the bottom of the Surf Rake® frame to the bottom edge of the moldboard is set at the factory at 7 1/4"(18.42cm). This adjustment can be varied to change the cleaning depth and accommodate particular beach conditions. The moldboard is adjusted by two turnbuckles as shown in **Figure 10** (one side). Caution must be taken so that both sides of the moldboard are adjusted evenly and it should be noted that even a 1/4"(.635cm) adjustment makes a significant difference in the performance of the machine. ***Do Not Raise The Moldboard Too High.*** This will result in the Surf Rake® unnecessarily removing sand and will greatly accelerate tine and conveyor wear. If there are any questions regarding this adjustment, please call the factory for a more in-depth explanation.


FIGURE 10

OPERATING HINTS

The following general rules should be followed to attain maximum efficiency from your Surf Rake®.

If your Surf Rake® is picking up too much sand:	If your Surf Rake® is not removing enough debris:
1. Lower moldboard	1. Raise moldboard
2. Reduce conveyor belt speed	2. Increase conveyor belt speed
3. Increase tractor speed	3. Decrease your tractor speed

As beach conditions vary, the adjustments listed below should also be varied. Some general conditions and the proper settings for the condition are also listed below:

WET SAND	DRY SAND
Moldboard - lower	Moldboard - raise
Belt Speed RPM's - decrease	Belt Speed RPM's - increase
Tractor speed - not critical	Tractor speed - not critical

FIRM BEACH	SOFT BEACH
Moldboard - lower	Moldboard - raise
Belt Speed RPM's - decrease	Belt Speed RPM's - increase
Tractor speed - not critical	Tractor speed - not critical

BIG MATERIAL	SMALL MATERIAL
Moldboard - not critical	Moldboard - raise
Belt Speed RPM's - decrease	Belt Speed RPM's - increase
Tractor speed - slow	Tractor speed - not critical

CLAY OR SOIL IN SAND	PURE SAND
Moldboard - lower	Moldboard - raise
Belt Speed RPM's - decrease	Belt Speed RPM's - increase
Tractor speed - not critical	Tractor speed - not critical

HEAVY SEAWEED	BOTTLES
Moldboard - raise	Moldboard - not critical
Belt Speed RPM's - decrease	Belt Speed RPM's - decrease
Tractor speed - slower	Tractor speed - not critical

Once the proper settings have been found, ***a negligible amount of sand should be removed with the unwanted debris.*** After this setting has been attained, no further adjustment of the moldboard should be required. The daily variations can be satisfactorily dealt with by adjusting the conveyor RPM or tractor speed.

These rules are to be used as a general guideline. Each beach is unique and requires its own group of settings. With experience, the best settings can be found quickly allowing the Surf Rake® to be used to its maximum potential.

61780 0221

BARBER SURF RAKE® MODEL 600HD

SECTION 4 – MAINTENANCE

To prevent injury, before conducting any repair or maintenance on the Surf Rake®, ensure that the hydraulic pump is OFF, not just in neutral, and examine the machine carefully to assure that:

No hydraulic hoses remain pressurized

No parts of the machine are suspended without being mechanically blocked or supported.

All sources of power have been locked in the "off" position and tagged.

Follow OSHA regulations regarding hydraulic fluid, fire safety, guarding and, if applicable, lock-out/tag-out procedures.

Always ensure that the parking brake on the tractor is set before working on the Surf Rake® to prevent injury.

Never modify any part of the Surf Rake® without prior approval, in writing, from H. Barber & Sons, Inc. Do not replace any component of the Surf Rake® with one that is not manufactured by Barber or listed in this manual as a proper replacement part.

LUBRICATION

GREASE FITTINGS Lubricate all grease fittings every 40 hours of operation. **(See Maintenance and Lubrication Chart - Section 5)**

BUCKET CHAINS Bucket Chains should be sprayed with penetrating oil twice a year. Cover the chains with oil or grease before storing for the off-season.

CHAIN CASE ROLLER CHAIN Roller Chain should be oiled after every 200 hours of use.

TURNBUCKLES Turnbuckles should be cleaned and re-greased at the end of the season. In severe rusting areas this should be done more frequently.

PINS Cylinder and moldboard pins should be spot lubricated with oil every 4 weeks.

CYLINDERS Cylinder tops should be wiped clean and spot lubricated with penetrating oil every 100 hours and at the end of the season.

CONVEYOR CHAIN It is recommended that the Conveyor Chain be run dry. A dry graphite lubricant may also be used. Occasionally, especially after a period of disuse, light penetrating oil may be applied. Prior to winter storage, heavier oil may be applied to avoid rusting.

BARBER SURF RAKE® MAINTENANCE ADJUSTMENTS

DAILY ADJUSTMENT CHECK There are four basic component checks for proper adjustment to ensure that your Surf Rake® is operating to the efficiency for which it was designed. The four adjustments work together and should be checked each time the machine is used.

1. TIRE PRESSURE It is important for the proper operation of the Surf Rake® to have the two rear tires inflated to the same pressure.

TO ADJUST TIRE PRESSURE: Inflate tires to 18 PSI.
When the tires are not inflated the same, the tire with the lower pressure will in turn lower that side of the Surf Rake® and cause the tines on that side to be lower. The result is the conveyor belt will clean unevenly, possibly picking up sand on the lower side or not cleaning deep enough on the higher side.

2. BUCKET / LIFT ARM CHAIN ASSEMBLIES It is important for the proper operation of the Surf Rake® to have the bucket/lift arm chains on each side of the Surf Rake® under the same tension, and not left loose, so they will share the load when lifting and tripping the hopper.

TO ADJUST BUCKET CHAINS: When the bucket is sitting on the frame, the chain/turnbuckle assemblies should be tight. Tighten up loose chain/turnbuckle assemblies so that both sides have the same tension and the bucket support blocks are just off or barely touching the frame.

When one chain assembly is loose while raising the bucket, all the weight and pressure of lifting the bucket is shifted to the tighter chain assembly. This causes the tighter chain assembly to stretch more than it would if both chain assemblies were the same tension. This causes premature wear to the links and the chains and can cause sudden failure to one or both of the chain assemblies. If both chains become loose, the bucket will not fully return to the forward/bottom position and will bottom out farther back on the frame than it should. This will allow a gap between the bucket and the path of the debris being thrown by the conveyor that allows the debris to drop down in front of the bucket.

3. CONVEYOR BELT TENSION It is important for the proper operation of the Surf Rake® to have both sides of the conveyor belt with the same tension.

TO ADJUST THE CONVEYOR BELT: Open the side guard doors on both sides of the Surf Rake®. Pull the conveyor belt back and forth midway between the upper 8" idler roller wheel and lower 8" idler roller wheel to check for amount of play. If there is more than 1 ½" of play, tighten the adjusting bolt. This will raise the upper shaft and tighten the conveyor assembly. Repeat this procedure on the other side of the conveyor assembly. Take some time and go back and forth to each side of the machine, checking that both sides are the same tension. Once both sides are the same tension, retighten the jam nuts on the take up bolts and refasten the doors/guards.

When the conveyor belt assembly is loose on one side, the belt will naturally sag on that side and cause the tines to drag on that side. The result is premature wear to the tines, an uneven cleaning and possibly picking up sand.

4. MOLDBOARD HEIGHT It is important for the proper operation of the Surf Rake® to have both sides of the moldboard adjusted identically to the same height. The moldboard is initially set evenly. For most applications, this factory setting works well. If the factory setting is changed, be advised that a small amount of adjustment has dramatic results. Do not move more than ¼" at a time without testing the new setting in the sand for a period of time. Use the guides at the sides of the moldboard to align both sides identically.

TO ADJUST: Loosen the turnbuckle locking arms on the sides to be moved. Use the guides at each side of the moldboard to level the moldboard to the desired height. Be sure that the guides are set at the same mark or location on each side. Retighten the turnbuckle locking arm/s.

The moldboard levels the beach so the tines can penetrate and clean the sand to a constant depth. If the moldboard is too high on one side, the tines will be forced too deep into the sand. This will result in sand being removed along with the debris. **At no time should the Barber Surf Rake® pick up sand.**

HYDRAULIC MOLDBOARD (Option) The hydraulic moldboard can be powered up or down from the tractor. When the moldboard is lowered, the life of the conveyor system is maximized. By varying the height of the moldboard, the depth of cleaning is varied.

CONVEYOR BELT DRIVE COMPONENTS – INSPECTION AND ADJUSTMENT

MAIN SHAFT

MAIN SHAFT SPROCKETS Make a visual inspection of the sprockets for wear. If the sprocket tooth is worn down half of its original width, it should be replaced. There is no adjustment to be made on the sprockets.

MAIN SHAFT BEARINGS Try and lift the main shaft either with a pry bar or by hand. If there is play or movement, an adjustment can be made to tighten the bearing.

TO ADJUST THE MAIN SHAFT BEARINGS: Unscrew machine screw on side of main shaft bearing and remove retaining ring stop. Turn retaining ring clockwise until there is little or no play. Reinsert the stop and screw. Do not over-tighten. The drive chain and drive sprocket must be removed to adjust the bearing on the chain case side. If adjusting does not remove the play from the bearing, it must be replaced.

TO REMOVE THE MAIN SHAFT BEARINGS:
Remove the top shield, side guards, and conveyor belt assemblies.
Remove the chain case cover.
Loosen the motor jam nut and take up bolt.
Loosen the motor mount bolts and slide back the motor to loosen the drive chain.
Remove drive chain.
Remove large drive sprocket.
Loosen the set screws on the cast iron conveyor belt sprocket that is farthest away from the chain case - the left side.
Clean the paint off of the inner/left side of the main shaft and move the left side cast iron conveyor belt sprocket toward the center of the main shaft.
Remove the left/outer-retaining ring, which holds the cartridge bearing in its sleeve.
Pull the main shaft away from the chain case so that the left bearing slides out of its sleeve and can be taken off of the shaft.
Remove the right inner retaining ring and push the cartridge bearing out of its sleeve.
If the cartridge bearing is locked into place, a bearing puller can be purchased to help remove the bearing.

TOP SHAFT

TOP SHAFT SPROCKETS Make a visual inspection of the sprockets for wear. If the sprocket tooth is worn down half of its original thickness, the top shaft should be replaced. There is no adjustment to be made on the sprockets.

TOP SHAFT BEARINGS The top shaft bearings are take-up bearings. Clean off any debris or excess grease and visually inspect for wear or damage. Use a pry bar to check for wear pushing on the bar to inspect for movement. If there is no movement, clean and grease. If the bearings or sprockets are visibly damaged or have movement, they must be replaced.

TO REMOVE THE TOP SHAFT: Raise the bucket and secure it with the safety support (545JJCA).
Remove the top shield. Loosen up the six 1/2" wing nuts (518AA) that secure the top shield to the side shields. The top shield is hinged. Flip up the lower section of the top shield so it rests on the upper section of the top shield. Remove the top shield assembly by lifting it off the side shields.

REMOVE SIDE SHIELDS The side shields are slotted so that they can be lifted off the frame once the bolts that attach them to the frame are loosened (four bolts) or removed (two bolts).
There are three 3/8" bolts on each side, which secure each guard. The top set of bolts has no hidden nuts and loosens with either a 9/16" socket or box wrench. They can be completely removed from the frame.

The middle set of bolts has nuts, which are accessible and hidden on the inside of the frame. They should be partially loosened with a 9/16" socket and box end wrench. Loosen three or four turns but do not remove from the frame.

One of the bottom bolts/nuts is accessible behind the chain case and must be loosened three or four turns with an open end wrench. The other bottom bolt can be loosened three or four turns with a 9/16" socket and box end wrench.
Raise the bottom end of the side guard first, and then lift the guard off of the bolts.

Remove the two ½" wing nuts that secure the chain case cover to the chain case. Remove the chain case cover. Position the connecting link midway between the large and small drive sprockets. Remove the connecting link and the drive chain.

The tractor can be unoccupied from the SURF RAKE® at this point.

There is an overlap at the ends of the conveyor belt rubber belting. The overlap is under one of the rows of springs. The belt must be disconnected at this overlapped row. To find the overlap, look inside the belt while turning it. The channel on the inside of the belt will partially hide the ends of the rubber belting, but the end of the belting will be visible. When it is found, the overlapped row should be positioned one row up from the rear bottom sprockets.

Loosen the jam nuts on the take up bolts (1 1/8" open ended wrench), which are located behind the small/upper side door shields on both sides of the machine.

The top shaft is a sliding/take up shaft. It is used for tensioning and loosening the conveyor belt. By loosening the take up bolts, the top shaft will lower and the conveyor belt will loosen. Loosen the take up bolts until the conveyor belt stops lowering (1 1/8" socket with one 12" and one 6" extension). Loosen both sides completely.
The conveyor belt must be clamped to prevent it from rolling off/down when all fasteners and chains from the overlapped row are removed. Clamp each side using a c-clamp type vice grip or similar clamps. Position the clamps through the chain and fasten the clamps to the arms that hold the skid shoes. Remove the row of tines that covers the overlap by removing the 5/16" nuts that secure the channels-backing strips-retaining bars (use a 1/2" socket with 6" extension & 9/16" box wrench).

Remove the cotter pin and connecting pin from the chains. If the chains are worn out and being replaced, they can be torched apart.

There are 28 rows on the belt. Count 14 rows or half way from where the belt is split. A lifting chain should be hooked at or near this midpoint location on each side of the conveyor belt. This will allow the lowest height necessary to lift the conveyor belt off of the machine.

When the lifting chain is fastened/hooked to the conveyor belt chain and enough tension is on the lifting chain to prevent the conveyor belt from moving, remove the clamps that prevent the conveyor belt from rolling off/down.

Lift the conveyor belt up/off of the machine being careful of the cylinders at the top of the machine and of the hydraulics at the front of the machine.

The conveyor belt can also be pulled off from the rear of the machine.

Once the belt is off, the top shaft lifts up the guides and off the frame. It is easiest to have two people lift it

off. It must be lifted off straight and even.

It is important to make a note of the bearing location on the top shaft to ensure correct placement of the new bearings. Measure the distance from the edges of the bearings to the ends of the shaft and to the edge of the sprockets. The better centered the sprockets are the smoother the belt will run. The bearings can only go on one way. The collars must face the outside.

It is possible to rotate the top shaft to allow the unused side of the sprocket teeth to be in contact with the conveyor belt chain, prolonging the life of the top shaft.

Loosen the set screws on the bearings and pull the bearings off the top shaft. It usually takes a bearing puller to remove the bearings. Mark a centering hole on the shaft to keep the bearing puller straight. Clean, file or sand any imperfections that will prevent the bearing replacement.

Put the new bearings on the top shaft. Do not tighten the bearings onto the shaft yet. Do not grease the bearings yet. Replace the top shaft assembly into the take-up guides of the frame. This is a short two-man step. Each person should be on the ends of the shaft. The first person should position one bearing into the take-up guides and just start it down the guides. The second person should use a large screwdriver to help position the second bearing into the take-up guides. When both sides are in the guides, let the top shaft assembly drop all the way down the guides. A rubber hammer will help to get the shaft down the guides. Center the shaft/sprockets so they are even on both sides. Tighten down the set screws when the top shaft is centered.

Grease the bearings until grease is visible at the seals. Wipe off any excess grease. Any excess grease will immediately have sand adhering to it creating a situation where abrasion will occur.

Replace the belt using the belt removal sequence in reverse.

3 ½" ROLLERS AND 8" IDLER ROLLERS INSPECTION AND ADJUSTMENT
There are four 3 ½" steel rollers and four 8" poly rollers that support and guide the conveyor belt on the 600HD. The 3 ½" rollers are used to support the conveyor chains. Two of the 8" poly rollers support and guide the conveyor belt over the front of the bucket. The other two 8" poly rollers turn the belt at the bottom of the machine, directing the belt toward the front main shaft and providing a plane of four rows of tines that clean the sand. The internal components are the same for all rollers. Look for any wear on the outside diameter/working surface of the roller. On the metal rollers there will be grooves from the contact with the conveyor chains. If there are flats on the metal roller it must be replaced. To check for wear, loosen the conveyor belt by backing off the adjusting bolts located on each side under the top shaft take-up bearings. Take the weight off of the roller you are inspecting. Check for any wobbling or play. If there is play, the bearings are worn but can be adjusted.

TO ADJUST THE IDLER ROLLERS: Shims are used to compensate for wear. Remove the bearing from the machine. Remove the external retaining ring and cover from the roller. Clean the grease away from the pin and retaining ring. Remove the retaining ring off of the pin. Add shim(s) as necessary, replace retaining ring and recheck for play. Repeat until the roller is tight on the pin. The rollers ride on tapered roller bearings. The bearings will wear out prematurely if not adjusted for wear.

CHAIN CASE SPROCKETS AND CHAIN The drive chain sprockets and chain will wear with use and need to be adjusted periodically. Remove chain case cover and check chain tightness. There should be ½" play in the chain, midway between the sprockets. Check the condition of the teeth of the sprockets. If they are worn down to half their original thickness, they should be replaced. The chain should be replaced if the sprockets are replaced.

TO ADJUST THE CHAIN CASE DRIVE CHAIN: Loosen the take-up bolt and nut away from the motor base plate. Slightly loosen the two motor mount bolts to allow the motor to slide. Tighten the take-up bolt until there is ½" play in the drive chain. Re-tighten the motor mount bolts and the take-up nut. Re-check the chain for correct tension. Only use dry film lubricant on the chain. Do not use grease or oil that will attract sand and shorten the life of the components.

SKID SHOES – SOLID BELT There are two skid shoes located underneath the conveyor belt on each side and on the inside of the side frame. There are wear blocks on each end of the conveyor belt channels that ride on the skid shoes. The skid shoes prevent the belt from sagging while elevating the picked up debris on its way up to the hopper. The skid shoes are made of an abrasion resistant material and must be replaced when they wear down to a thickness of 1/8". Inspections should be made every month to monitor the wear.

TO REMOVE THE SKID SHOES: Open the side door/guard. Tighten the conveyor belt fully to take the weight off of the skid shoes. Do this on each side of the machine. Loosen and remove the two ½" bolts that hold each skid shoe to the side frame arms. Note the way that the angles/brackets of the skid shoes are situated in relation to the side frame arms. Pry the skid shoes out toward the center of the machine. Replace with new skid shoes and fasteners. The skid shoes should sit down flush on the side frame arms that they fasten to. A clamp may be needed to hold the skid shoes down when refastening to ensure that they are flat on the arms. Slightly loosen the conveyor belt until there is one-inch play midway between the large 8" rollers.

SKID SHOES – SIFTING BELT There are two skid shoes located underneath the conveyor belt on each side and on the inside of the side frame. The skid shoes prevent the belt from sagging while elevating the picked up debris on its way up to the hopper. The skid shoes are made of an abrasion resistant material and must be replaced when they wear down to a thickness of 1/8". Inspections should be made every month to monitor the wear. There are two 3/8" nuts that secure the each skid shoe to the sideframe.

HYDRAULIC COMPONENTS

BUCKET MANIFOLD The bucket manifold, a sequence valve, runs the two functions of the bucket. It both raises and trips the bucket.

CYLINDERS The large and small cylinders are of similar design. They are single acting cylinders. Hydraulic pressure from the towing vehicle raises the cylinders and the weight of the bucket and gravity lowers them. Check for hydraulic leaks. There are seal kits to repair leaking cylinders. A WD-40 type penetrate can be used to prevent the seals from drying out when the machine sits for the off-season. It can also lubricate the rods when first operating a machine after it has sat for a period of time. Clean the breathers to improve airflow in and out of the cylinders.

TO REPLACE THE CYLINDER SEALS: Power wash or clean the cylinder before removing it from the machine. Remove hose from the cylinder. Remove breather from the cylinder. Place the base of the cylinder in a vice and position the cylinder horizontally. Use a bar through the piston rod hole to pull out the piston and piston rod assembly.

Small Cylinder – Have someone compress the retaining ring at the top of the cylinder while you pull the gland and rod assembly out of the cylinder. If the retaining ring is rusted, it is advisable to use penetrating oil and clean up the ring and adjoining area. The retaining ring ends must touch in order to disassemble. Pull out as straight as possible.

Large Cylinder - Unscrew the top with a spanner wrench. Remove the rod/piston assembly. Never try to slide the gland over the end of the piston rod. To clean gland, remove nut on bottom of piston rod and disassemble from that side.

Before removing seals, wipers and o-rings, take note of their orientation in the piston and gland. When replacing felt wipers, make sure they have been saturated in oil. Coat all surfaces in oil before reassembly.

WHEELS SPINDLES AND AXLES To check for play in the spindle/hubs, elevate the wheels off of the ground and check for play or looseness on the spindles. It is easier to determine if adjustment is necessary when the tire/wheel is off the hub. If there is excessive play, the bearing and races should be inspected for damage.

TO ADJUST WHEEL HUBS: Remove the buddy hub/grease reservoir from the end of the hub. Clean away the grease. Remove the cotter pin. Tighten the castle nut assembly until the play is gone. Reinsert the cotter pin and grease reservoir. There is a blue collar on the grease reservoir that extends out when grease is added. Add grease to the reservoir until the blue collar extends out. Check for tightness of the wheel cone nuts. They should be tightened to 95 ft/lbs. Tires should be inflated to 18 PSI.

TINE REPLACEMENT Replace tines as they break. Your machine can clean effectively with 20 or 30 tines missing; however, it is advisable to replace them soon after they break. When a tine is broken, the work it would normally do picking up material is transferred to the adjacent tines. This will overwork them and, in turn, shorten their life. Never operate your machine with more than 50 broken tines. Tines will shorten as they are used and should be replaced when they wear to within ½" of the bends.

The most convenient location for removing and replacing tines on the conveyor belts is at the back of the machine with the bucket raised and secured with the safety support. Never work on the machine without the safety support in place.

Position the belt. Rotate the conveyor belt slowly and stop it when the row on which you are going to replace the tines is at the top, back of the machine and parallel to the ground.

REMOVAL AND REPLACEMENT OF 504FH TINES (SIFTING BELT)

TOOLS RECOMMENDED: Safety support is REQUIRED! 3/8" ratchet, 6" socket extension and 1/2" socket (6 point) or a 1/2" combination wrench.

The tines are secured on the retaining bar by a spacer washer and a locknut. Loosen off the retaining washer and nut and remove the old tine. Reapply a small amount of antiseize to the threaded stud before reassembling. Start the washer and nut back onto the threaded stud, leaving enough room to allow the tine to be positioned underneath.

Tines should be parallel to each other and to the conveyor. Be sure the tines are positioned next to the retaining bolt and well secured under the retaining washer and nut. Tighten the retaining nut 18 to 20 PSI.

REMOVAL AND REPLACEMENT OF 504F-1 TINES (SOLID BELT)

TOOLS RECOMMENDED: Safety support is REQUIRED! Impact gun or ratchet, 6" socket extension and 9/16" socket (6 point), large flat blade screwdriver, 9/16" combination wrench, drive torque wrench.

The tines are secured under the retaining bars (516A/516B) and kept in position by a series of divots on the retaining bars. Loosen conveyor bolts (SIX REVOLUTIONS MAXIMUM). Bolts on both sides of any tine must be loosened in order to remove and replace the tine. The center bolts are secured by wing nuts that will fall to the inside of the belt if the bolts are loosened more than 6 turns. Marking the side of the 9/16" socket with a bright colored line will allow you to count the revolutions while loosening a bolt. If a tine is to be replaced next to the belt chain, the end bolts that secure the chain to the retaining bar must be loosened from the side location of the machine.
Once the bolts are loosened, place the screwdriver between the retaining bar and the backing strip and next to the tine that you are removing. Pry the retaining bar away from the belt and remove the tine. Place the new tine under the retaining bar and resting on the backing strip, make sure that it is positioned correctly around the divot. Torque center bolts to 22 ft.-lbs. (30 Meter-Newtons). If a torque wrench is not available, tighten the bolts so that the retaining bars are tight against the spacer washers on which they sit. If the retaining bars bend when tightening, back off until the retaining bar is straight. Torque end bolts to 40ft.-lbs. (54 Meter-Newtons).

61780 0221

REMOVAL AND REPLACEMENT OF CHANNEL STUDS 560B05095S (SIFTING BELT).

TOOLS RECOMMENDED: Channel Stud Replacement Tool 504CM02, 5/8" socket or ratcheting wrench, hammer, punch, oil. The Bucket Safety Support is REQUIRED when working at the rear of the conveyor with the bucket elevated!

When the top of a channel stud has broken off from use, the stud must be replaced. The base of the stud must be removed from the channel using a punch and hammer from the topside of the conveyor belt. The washer can be reused. The replacement stud should be pushed through from the inside of the conveyor belt. The stud's splines can be aligned/turned into the grooves in the channel that were made from the broken stud. Place the washer onto the stud and then thread the lightly oiled Channel Stud Replacement Tool onto the stud by hand, as far as it will go. Tighten the tool until the head of the stud is flush with the channel. The tool is threaded on both ends and each end will tighten between 10 -15 studs. **DO NOT** use power tools to install studs.

Please visit the **SURF RAKE Maintenance Video Section** of our website, by clicking the following link:
http://www.hbarber.com/customer-service/Maintenance/surf-rake-maintenance.html

61780 0221

Barber SURF RAKE® Model 600HD

Maintenance & Lubrication Schedule

Every 8 Hours or Every Day:

- Wash Machine After Use

Every 40 Hours or Every Week: Lubricate the following:

Chart Ref. #	Barber Part #	Description (Quantity)
1	549AS08	8" Roller Assemblies (4)
17	503JJ	Main Shaft Bearings (2)
3	503VV	Upper Shaft Bearings (2)
22	549AS10A	Roller Assembly Bearings (4)
2	527GF-4	Wheel Bearings (2)
18	545JJF	Large Cylinder Fittings (4)
19	545JJH	Small Cylinder Fittings (4)
15	A523HD	Dump Sprocket Fittings (4)
14	508RG	Top Lift Arm Sleeve Bearing Fitting (2)
	508RA	Caster Arm Sleeve Bearings (2) (Optional Equipment)

Every 40 Hours or Every Week Inspect and/or Adjust:

Chart Ref. #	Barber Part #	Description (Quantity)
24	504F-1 or 504FH	Replace Damaged Tines / Clear Obstructions on tines
20	A504	Inspect Conveyor Belt Tension (Both Sides)
21	540G	Adjust Conveyor Belt Tension If Needed (Both Sides)
6	527KC-1	Inspect and Adjust Tire Pressure 18 PSI (2)
23	525ZP	Inspect and Adjust Bucket Chain Assemblies if Necessary

Every 200 Hours or Every 2 Months:

Chart Ref. #	Barber Part #	Description (Quantity)
	504G	Check / Torque End Bolts on Conveyor to 40psi (56)
4	522JT1	Spot Lubricate Moldboard Turnbuckle Pins (4)
13	545MM	Clean Breather / Filter on Hydraulic Tank
11	545C	Change Hydraulic Filter
9	503MMC	Inspect and Adjust, if necessary, Main Shaft Drive Chain
10	645	Check Hydraulic Tank Fluid Level
26	542DA	Push flap down so it touches chain

Every 500 Hours or Once a Year:

Chart Ref. #	Barber Part #	Description (Quantity)
7	527GF-4	Adjust / Repack / Replace (if needed) Wheel Bearings
12	645HM	Clean Hydraulic Tank Strainer
8	522JT	Clean and Grease Moldboard Turnbuckle Assembly (2)
25	549AS10A 549AS08	Inspect and Reshim Conveyor Rollers, If Necessary (8)

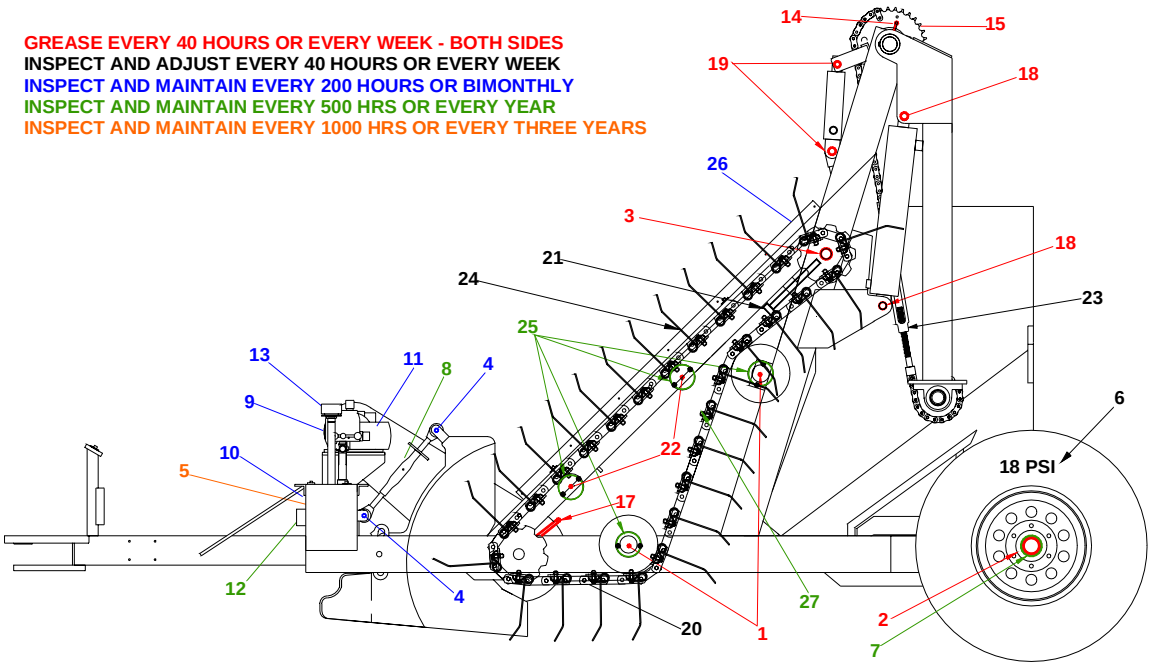
Every 1000 Hours or Once Every 3 Years:

Chart Ref. #	Barber Part #	Description (Quantity)
5	645HYOIL	Change Hydraulic Fluid 13 Gal (ISO-32 Grade or Equivalent)

61780 0221

MAINTENANCE AND LUBRICATION CHART

GREASE EVERY 40 HOURS OR EVERY WEEK - BOTH SIDES
INSPECT AND ADJUST EVERY 40 HOURS OR EVERY WEEK
INSPECT AND MAINTAIN EVERY 200 HOURS OR BIMONTHLY
INSPECT AND MAINTAIN EVERY 500 HRS OR EVERY YEAR
INSPECT AND MAINTAIN EVERY 1000 HRS OR EVERY THREE YEARS



5-2

61780 0221

BARBER SURF RAKE®
MODEL 600HD

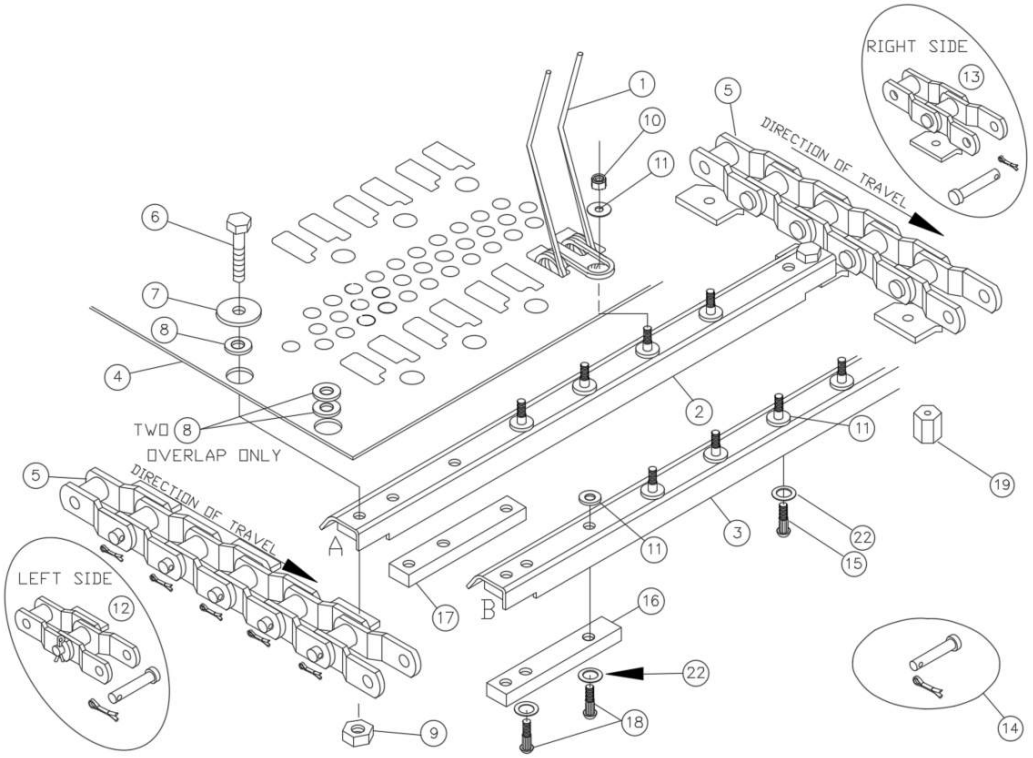
SECTION 6 – PARTS CATALOG AND ORDERING

When Ordering Parts, please have the following information available:

1. Model and serial number of your SURF RAKE®
2. Part number, description and page number
3. Shipping and billing address
4. Method by which shipment is to be made
5. Full name of consignee
6. Catalog number of this parts book

61780 0221

CONVEYOR

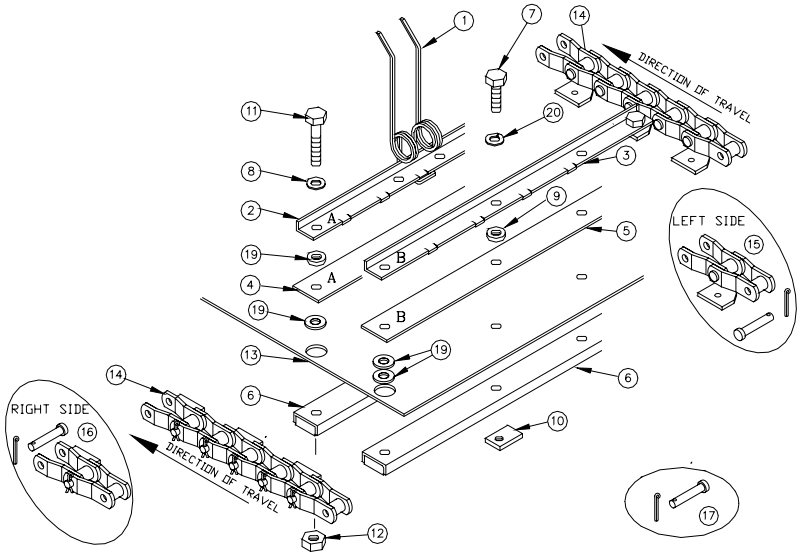


ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS 05/21
1	504FH	700	TINE
2	510HA	14	CHANNEL A WITH STUDS AND WASHERS
3	510HB	14	CHANNEL B WITH STUDS AND WASHERS
4	504AH	1	BELT
5	504DK	1	OFFSET CHAIN, COMPLETE (BOTH SIDES)
6	504G	56	CAPSCREW
7	560W06S	56	WASHER
8	560W06H	58	SPACER, SILVER
9	504H	56	LOCKNUT
10	560N05LS	700	LOCKNUT
11	560W05S	1400	WASHER
12	504DKSL		OFFSET CHAIN SEGMENT, LEFT SIDE
13	504DKSR		OFFSET CHAIN SEGMENT, RIGHT SIDE
14	404DB		CHAIN PIN AND COTTER
15	560B05095S	588	STUD, SHORT
16	510FB01	28	END BLOCK
17	510FB02	28	END BLOCK
18	560B05144S	112	STUD, LONG
19	504CM02		CHANNEL STUD REPLACEMENT TOOL
20	A504H		CONVEYOR ASSEMBLY COMPLETE (NOT SHOWN)
21	504AH02		BELT SPLICE (NOT SHOWN)
22	560W05N	700	WASHER, PLASTIC

61780 0221

6-2a

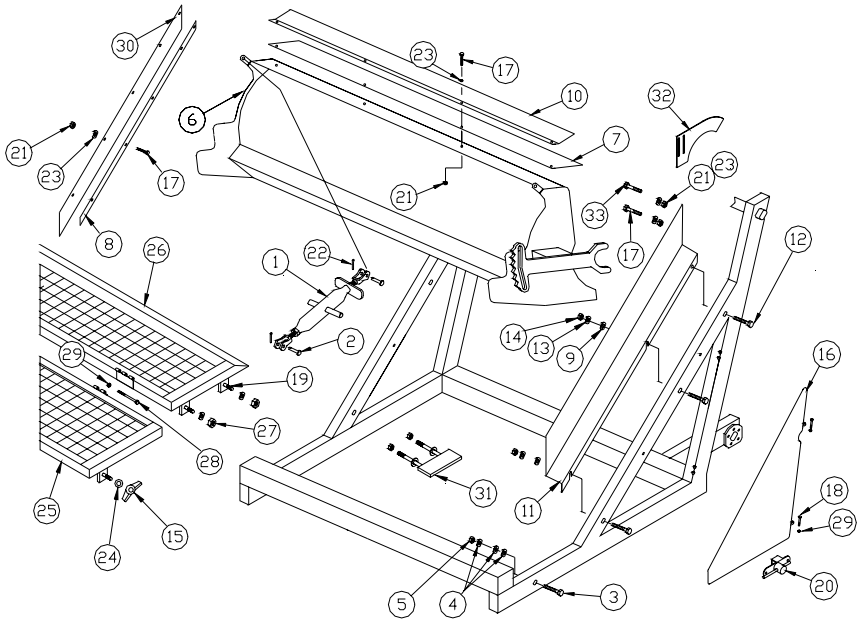
CONVEYOR



ITEM	PART NUMBER	QTY	DESCRIPTION 600HD
1	504F-1	714	TINE
2	516A	14	RETAINING BAR A TO IDENTIFY NOTE HOLE AND DIVOT SPACING
3	516B	14	RETAINING BAR B TO IDENTIFY NOTE HOLE AND DIVOT SPACING
4	512A	14	BACKING STRIP A (IDENTIFIED BY MATCHING HOLE PATTERN TO RETAINING BAR A)
5	512B	14	BACKING STRIP B (IDENTIFIED BY MATCHING HOLE PATTERN TO RETAINING BAR B)
6	510	28	CHANNEL
7	504J	378	CAPSCREW
8	504M	56	WASHER
9	504N	378	WASHER, SPACER, NYLON, BLACK
10	504K	378	ANCHOR NUT
11	504G	56	CAPSCREW
12	504H	56	LOCKNUT
13	504A	1	BELT
14	504DK	1	OFFSET CHAIN, COMPLETE (BOTH SIDES)
15	504DKSL		OFFSET CHAIN SEGMENT, LEFT SIDE
16	504DKSR		OFFSET CHAIN SEGMENT, RIGHT SIDE
17	404DB		CHAIN PIN WITH COTTER PIN
18	A504S		CONVEYOR ASSEMBLY COMPLETE (NOT SHOWN)
19	504P	114	WASHER, SPACER, STEEL, GOLD
20	509H	378	LOCKWASHER

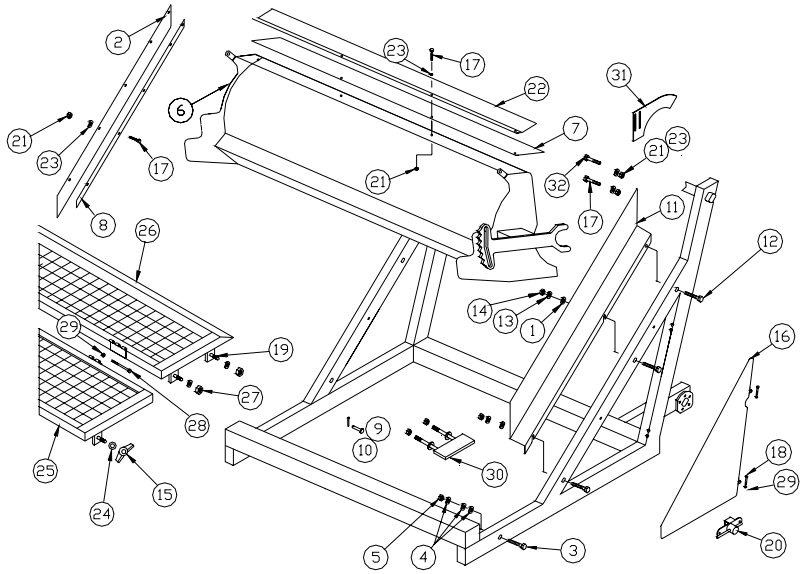
61780 0221

MOLDBOARD & SHIELDS



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS "S" BELT STANDARD
1	522JT	2	TURNBUCKLE
2	522JT1	4	PIN
3	509D	2	BOLT
4	509C	8	FLAT WASHER
5	509FA	2	LOCK NUT
6	522AS01	1	MOLDBOARD
7	522F	1	MOLDBOARD FLAP
8	542DB	2	STONE GUARD FLAP HOLD DOWN
9	514G	6	FLAT WASHER
10	522G	1	MOLDBOARD FLAP HOLD DOWN
11	542AS01 (R/L)	2	SIDE GUARD (LEFT SHOWN)
12	514D	6	CAPSCREW
13	509H	6	LOCK WASHER
14	509J	6	HEX NUT
15	518AA	2	WINGNUT
16	543AS04 (R/L)	2	SIDE GUARD (LEFT SHOWN)
17	524X	14	CAPSCREW
18	560B04175	4	CAPSCREW
19	560B08100	4	CAPSCREW
20	560LA01	2	SPRING LATCH ASSEMBLY
21	560N05L	14	HEX NUT
22	522JT2	4	COTTER PIN
23	524S	14	FLAT WASHER
24	603GG	6	FLAT WASHER
25	542EB	1	LOWER TOP SHIELD ASSEMBLY
26	542EA	1	UPPER TOP SHIELD ASSEMBLY
27	560N08L	4	LOCKNUT
28	560B04450	2	CAPSCREW
29	560N04L	8	HEX NUT
30	542DA	2	STONE GUARD FLAP
31	541AS01	2	SKID SHOE (SIFTING BELT ONLY)
32	542BU05	2	TAKE UP GUARD
33	560B05125	2	CAPSCREW

MOLDBOARD & SHIELDS

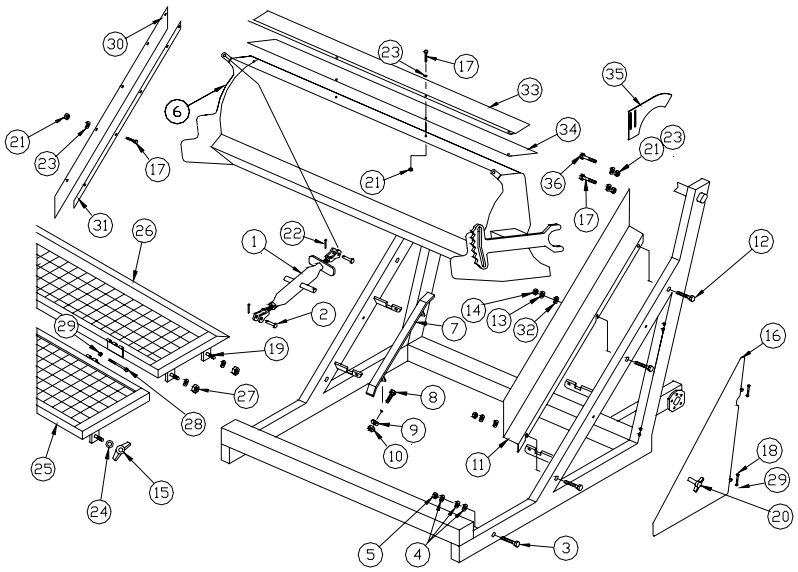


ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS "S" BELT HYDRAULIC (OPTION)
1	514G	6	FLAT WASHER
2	542DA	2	STONE GUARD FLAP
3	509D	2	BOLT
4	509C	8	FLAT WASTER
5	509FA	2	LOCK NUT
6	522AS02	1	MOLDBOARD, HYDRUALIC OPERATED
7	522F	1	MOLDBOARD FLAP
8	542DB	2	STONE GUARD FLAP HOLD DOWN
9	530CM06	4	PIN
10	560C02150	4	COTTER PIN
11	542AS01 (R/L)	2	SIDE GUARD (LEFT SHOWN)
12	514D	6	CAPSCREW
13	509H	6	LOCK WASHER
14	509J	6	HEX NUT
15	518AA	2	WING NUT
16	543AS04 (R/L)	2	SIDE GUARD (LEFT SHOWN)
17	524X	14	CAPSCREW
18	560B04175	4	CAPSCREW
19	560B08100	4	CAPSCREW
20	560LA01	2	SPRING LATCH ASSEMBLY
21	560N05L	14	HEX NUT
22	522G	1	MOLDBOARD FLAP HOLD DOWN
23	524S	14	FLAT WASHER
24	603GG	6	FLAT WASHER
25	542EB	1	LOWER TOP SHIELD ASSEMBLY
26	542EA	1	UPPER TOP SHIELD ASSEMBLY
27	560N08L	4	LOCK NUT
28	560B04450	2	CAPSCREW
29	560N04L	8	HEX NUT
30	541AS01	2	SKID SHOE (SIFTING BELT ONLY)
31	542BU05	2	TAKE UP GUARD
32	560B05125	2	CAPSCREW

61780 0221

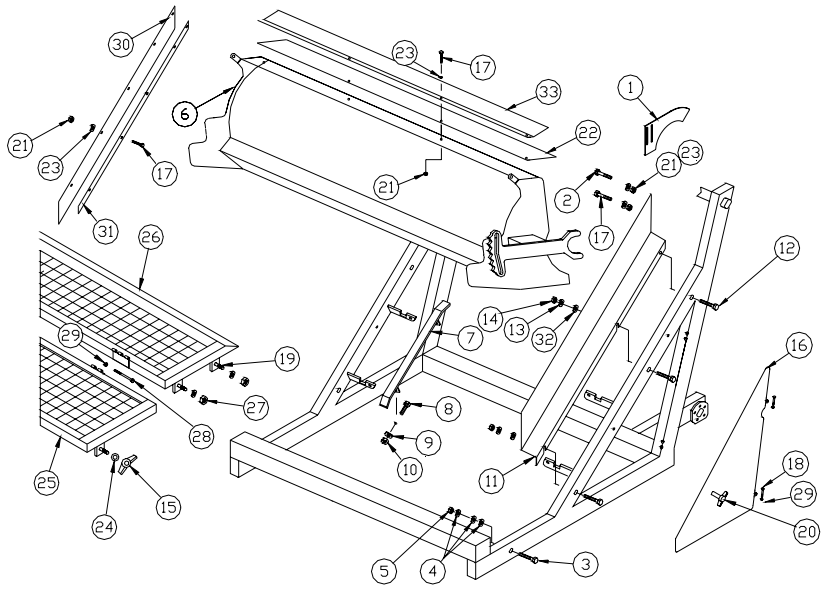
6-3b

MOLDBOARD & SHIELDS



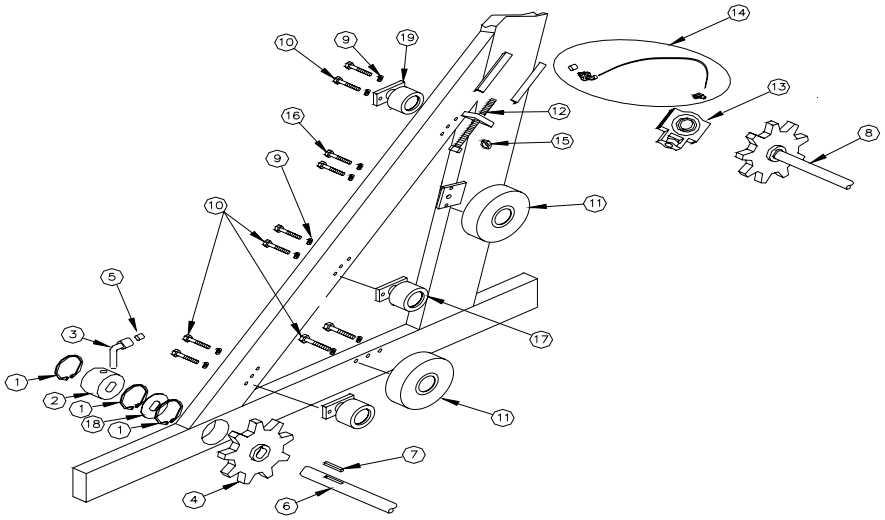
ITEM	PART NUMBER	QTY	DESCRIPTION 600HD SOLID BELT
1	522JT	2	TURNBUCKLE
2	522JT1	4	PIN
3	509D	2	BOLT
4	509C	6	FLAT WASHER
5	509FA	2	LOCK NUT
6	522AS01	1	MOLDBOARD
7	541	2	SKID SHOE
8	524D	4	CAPSCREW
9	524G	4	LOCK WASHER
10	523R	4	HEX NUT
11	542AS01 (R/L)	2	SIDE GUARD
12	514D	6	CAPSCREW
13	509H	6	LOCK WASHER
14	509J	6	HEX NUT
15	518AA	2	WINGNUT
16	543AS04 (R/L)	2	SIDE GUARD (LEFT SHOWN)
17	524X	16	CAPSCREW
18	560B04175	4	CAPSCREW
19	560B08100	4	CAPSCREW
20	560LA01	4	SPRING LATCH ASSEMBLY
21	560N05L	18	HEX NUT
22	522JT2	4	COTTER PIN
23	524S	18	FLAT WASHER
24	603GG	6	FLAT WASHER
25	542EB	1	LOWER TOP SHIELD ASSEMBLY
26	542EA	1	UPPER TOP SHIELD ASSEMBLY
27	560N08L	4	LOCKNUT
28	560B04450	2	CAPSCREW
29	560N04L	8	HEX NUT
30	542DA	2	STONE GUARD FLAP
31	542DB	2	STONE GUARD FLAP HOLD DOWN
32	514G	6	FLAT WASHER
33	522G	1	MOLDBOARD FLAP HOLD DOWN
34	522F	1	MOLDBOARD FLAP
35	542BU05	2	TAKE UP GUARD
36	560B05125	2	CAPSCREW

MOLDBOARD & SHIELDS



ITEM	PART NUMBER	QTY	DESCRIPTION 600HD SOLID BELT HYDRAULIC (OPTION)
1	542BU05	2	TAKE UP GUARD
2	560B05125	2	CAPSCREW
3	509D	2	BOLT
4	509C	6	FLAT WASHER
5	509FA	2	LOCK NUT
6	522AS02	1	MOLDBOARD
7	541	2	SKID SHOE
8	524D	4	CAPSCREW
9	524G	4	LOCK WASHER
10	523R	4	HEX NUT
11	542AS01 (R/L)	2	SIDE GUARD
12	514D	6	CAPSCREW
13	509H	6	LOCK WASHER
14	509J	6	HEX NUT
15	518AA	2	WINGNUT
16	543AS04 (R/L)	2	SIDE GUARD (LEFT SHOWN)
17	524X	16	CAPSCREW
18	560B04175	4	CAPSCREW
19	560B08100	4	CAPSCREW
20	560LA01	4	SPRING LATCH ASSEMBLY
21	560N05L	18	HEX NUT
22	522F	1	MOLDBOARD FLAP
23	524S	18	FLAT WASHER
24	603GG	6	FLAT WASHER
25	542EB	1	LOWER TOP SHIELD ASSEMBLY
26	542EA	1	UPPER TOP SHIELD ASSEMBLY
27	560N08L	4	LOCKNUT
28	560B04450	2	CAPSCREW
29	560N04L	8	HEX NUT
30	542DA	2	STONE GUARD FLAP
31	542DB	2	STONE GUARD FLAP HOLD DOWN
32	514G	4	FLAT WASHER
33	522G	1	MOLDBOARD FLAP HOLD DOWN

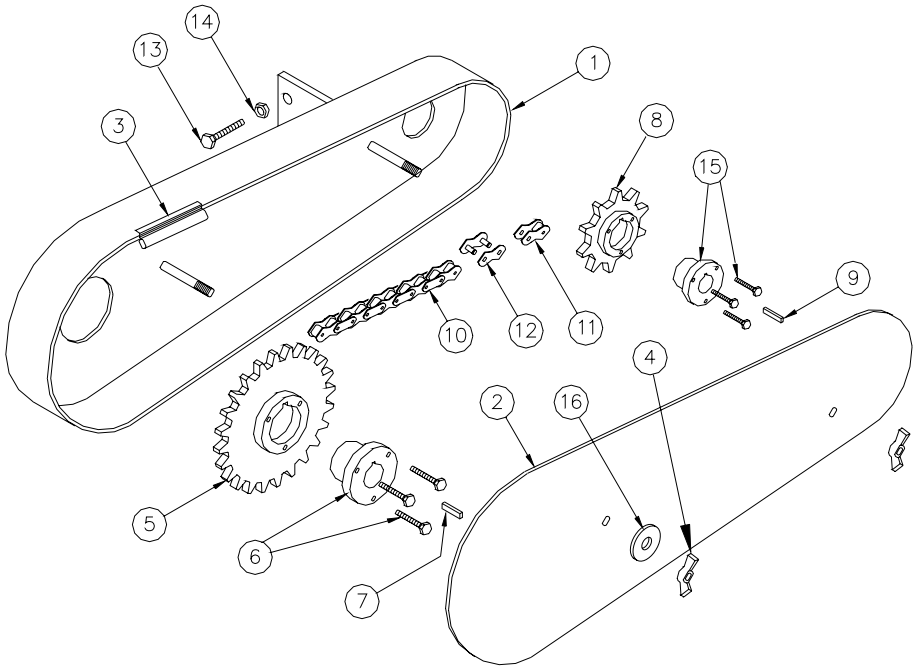
DRIVE MECHANISM



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	503KK	6	RETAINING RING
2	503JJ	2	BEARING
3	503LL	2	GREASE FITTING
4	503AA	2	SPROCKET
5	503CAP	12	GREASE COVER
6	536	1	SHAFT
7	503J	2	KEY
8	595AS01	1	SPROCKET AND SHAFT ASSEMBLY
9	509H	20	LOCK WASHER
10	560B06250	16	CAPSCREW
11	549AS08	4	SEE IDLER ROLLER ASSEMBLY PAGE
12	540G	2	TAKE UP BOLT
13	503VV	2	BEARING
14	503AS01	2	GREASE LINE ASSEMBLY
15	560N12S	2	JAMB NUT
16	560B06100	4	CAPSCREW
17	549AS10A	4	SEE ROLLER ASSEMBLY PAGE
18	508CM01	2	BEARING COVER
19	549AS20	2	TOP IDLER ROLLERS

61780 0221

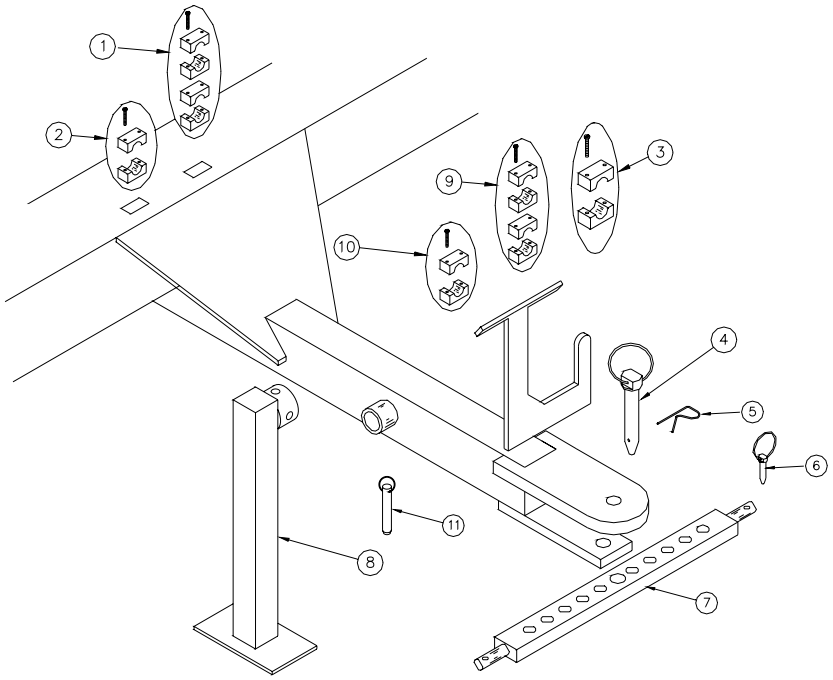
CHAIN CASE



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	A518	1	CHAIN CASE ASSEMBLY
2	518C	1	COVER PLATE
3	518D	1	GASKET
4	518AA	2	WING NUT
5	603E	1	SPROCKET
6	603D	1	BUSHING
7	503X	1	KEY
8	503W12	1	SPROCKET
9	503WHK	1	KEY
10	503MMC	1	CHAIN
11	503NN-1	1	HALF LINK
12	503NN-2	1	CONNECTING LINK
13	518K	1	CAPSCREW
14	523R	1	HEX NUT
15	503WB	1	BUSHING
16	603GG	2	FLAT WASHER

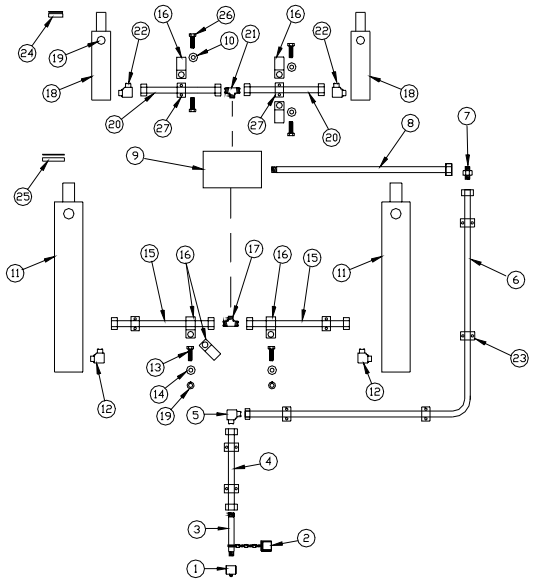
61780 0221

HITCH



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	540C1001	10	HOSE CLAMP, DOUBLE
2	608HX	1	HOSE CLAMP ½”
3	645HBB	1	HOSE CLAMP 1”
4	A552-1	1	HITCH PIN WITH COTTER
5	552D	1	HITCH PIN COTTER
6	552C	2	DRAW BAR SNAP PIN
7	552CAT2	1	DRAW BAR WITH SNAP PINS IS EITHER CATEGORY 1 OR 2 DEPENDING ON TRACTOR
8	553AS02	1	JACK STAND
9	540C1001	1	HOSE CLAMP DOUBLE W/ LARGER BASE BOLT
10	608HX	1	HOSE CLAMP W/ LARGER BASE BOLT
11	553CM02	1	JACK PIN
12	552AS01	1	PINTLE ATTACHMENT (NOT SHOWN)

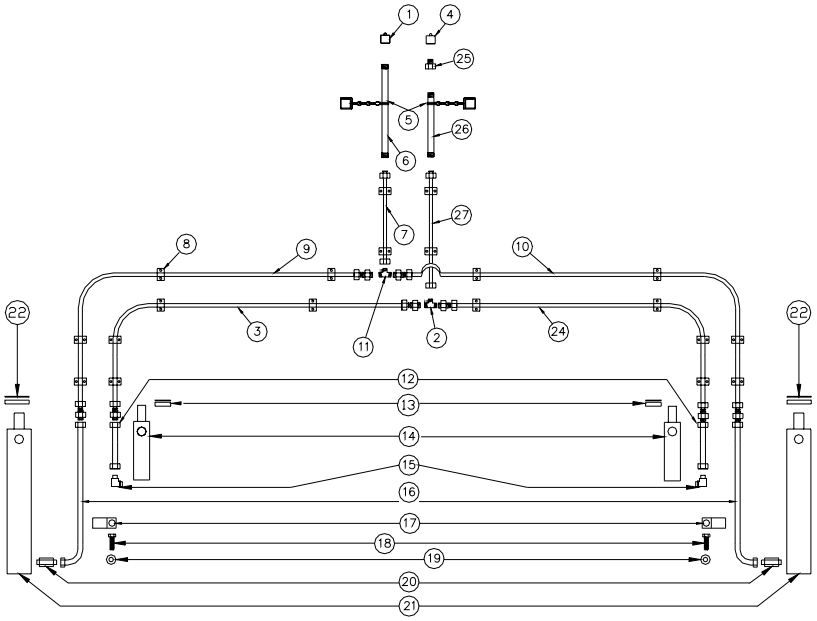
HYDRAULIC MANIFOLD LIFT



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS 0117
1	540A1001	1	QUICK DISCONNECT, MALE
2	545HD-13	1	QUICK DISCONNECT COVER
3	540H10050	1	HOSE
4	540B1001	1	TUBE
5	540E1003	1	ELBOW
6	540B1002	1	TUBE
7	540A0803	1	ADAPTER
8	540H080645	1	HOSE
9	540V006	1	MANIFOLD ASSEMBLY
10	560W04	3	WASHER
11	545JJF	2	CYLINDER
12	540E0801	2	ELBOW
13	524X	2	CAPSCREW
14	524S	2	WASHER
15	540H08060	2	HOSE
16	540C0801	6	HOSE CLAMP
17	540T0801	1	BRANCH TEE
18	545JJH	2	CYLINDER
19	524Y	2	LOCK WASHER
20	540H06045	2	HOSE
21	540T0601	1	BRANCH TEE
22	540E0601	2	ELBOW
23	540C1001	6	TUBE CLAMP
24	545JJHP	2	REPLACEMENT SEAL KIT PER CYLINDER
25	545JJFP	2	REPLACEMENT SEAL KIT PER CYLINDER
26	560B04225	4	CAPSCREW
27	540C1011	2	HOSE CLAMP

61780 0221

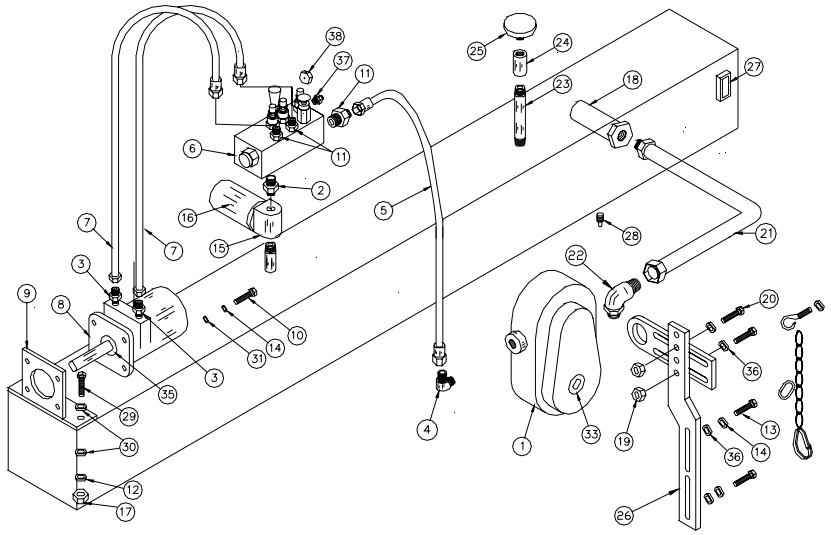
HYDRAULIC LIFT



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	540A1001	1	QUICK DISCONNECT, MALE
2	540T0602	1	TEE
3	540B0602	1	TUBE, LEFT
4	540A0809	1	QUICK DISCONNECT, MALE
5	545HD-13	2	QUICK DISCONNECT COVER
6	540H10068	1	HOSE
7	540B1001	1	TUBE
8	540C1001	10	HOSE CLAMP, DOUBLE
9	540B1002	1	TUBE, LEFT
10	540B1003	1	TUBE, RIGHT
11	540T1001	1	TEE
12	540H06026	2	HOSE
13	545JJHP	2	REPLACEMENT SEAL KIT PER CYLINDER
14	545JJH	2	CYLINDER
15	540E0601	2	ELBOW
16	540H08036	2	HOSE
17	540C0801	2	HOSE CLAMP
18	524X	2	CAPSCREW
19	524S	2	WASHER
20	540A0801	2	ADAPTER
21	545JJF	2	CYLINDER
22	545JJFP	2	REPLACEMENT SEAL KIT PER CYLINDER
23	540M002	1	O-RING ASSORTMENT PACKAGE (NOT SHOWN)
24	540B0603	1	TUBE, RIGHT
25	540R08073	1	ADAPTER / RESTRICTOR
26	540H06068	1	HOSE
27	540B0601	1	TUBE

61780 0221

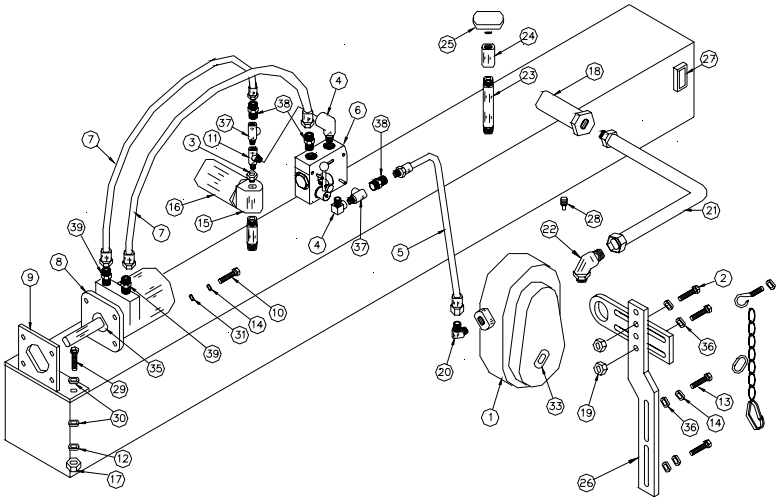
HYDRAULIC DRIVE WITH MANIFOLD



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS 0118
1	645HA	1	PUMP
2	540A1205	1	ADAPTER
3	540A1003	2	ADAPTER
4	540E1202	1	ELBOW
5	540H08105	1	HOSE
6	540V015	1	CONTROL MANIFOLD, REVERSING & FLOW
7	540H08024	2	HOSE
8	645HF	1	MOTOR
9	645HF-1	1	MOUNTING BRACKET
10	504J	4	CAPSCREW
11	540A0801	3	ADAPTER
12	503Q	2	LOCK WASHER
13	560B06100	2	CAPSCREW
14	509H	4	LOCK WASHER
15	545B	1	FILTER BASE
16	545C	1	FILTER ELEMENT
17	503S	2	HEX NUT
18	645HMA	1	FILTER – SUCTION SAE
19	560N06L	2	LOCKNUT
20	560B06125	2	CAPSCREW
21	540H16093	1	SAE SUCTION HOSE ASSEMBLY
22	540E1604	1	ELBOW
23	645HS	1	NIPPLE
24	545T	1	COUPLER
25	545MM	1	BREATHER
26	645HEG	1	PUMP BRACKET AND CHAIN
27	645HUA	1	GAUGE – OIL LEVEL
28	645HV	1	PIPE PLUG – MAGNETIC
29	560B09175	2	CAPSCREW
30	503R	4	FLAT WASHER
31	514G	4	FLAT WASHER
32	645HAAA	1	PUMP SEAL KIT, COMPLETE (NOT SHOWN)
33	645HAAB	1	PUMP SPLINE SEAL
34	645HFA	1	MOTOR SEAL KIT, COMPLETE (NOT SHOWN)
35	645HFB	1	MOTOR DRIVESHAFT DIRT SEAL
36	560W06S	4	FLAT WASHER
37	540A0602	1	ADAPTER
38	540R4500236	1	ORIFICE PLATE

61780 0221

HYDRAULIC DRIVE

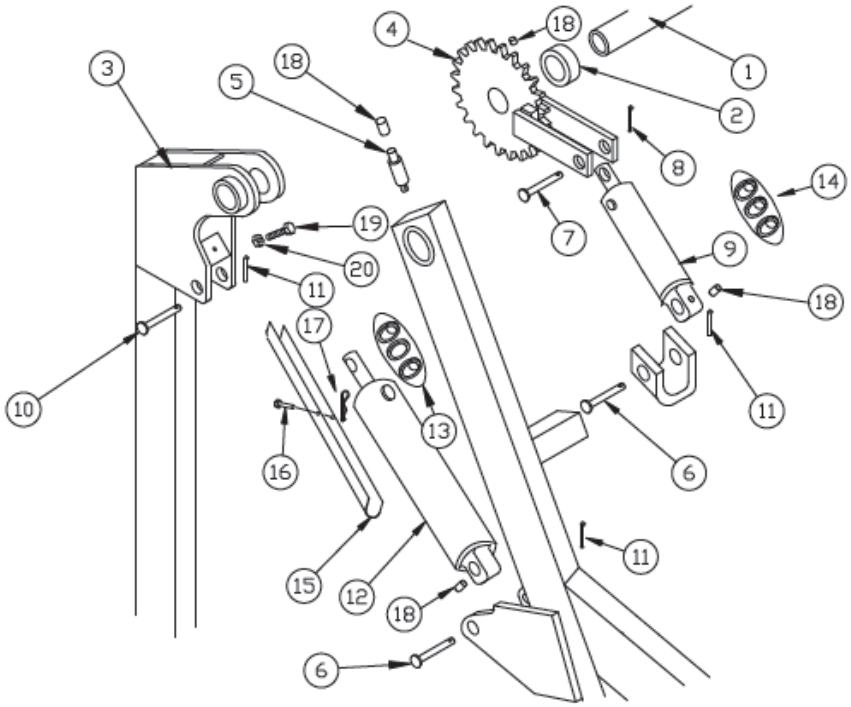


ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	645HA	1	PUMP
2	560B06125	2	CAPSCREW
3	645HC	1	REDUCER BUSHING
4	545R	2	STREET ELBOW
5 *	540H081122	1	HOSE
6	645HDD	1	FLOW CPNTROL
7	540H08024	2	HOSE
8	645HF	1	MOTOR
9	645HF-1	1	MOUNTING BRACKET
10	504J	4	CAPSCREW
11	540T0803	1	TEE
12	503Q	2	LOCK WASHER
13	560B06100	2	CAPSCREW
14	509H	4	LOCK WASHER
15	545B	1	FILTER BASE
16	545C	1	FILTER ELEMENT
17	503S	2	HEX NUT
18	645HMA	1	FILTER – SUCTION SAE
19	560N06L	2	LOCKNUT
20	540E1202	1	ELBOW
21 *	540H16093	1	SAE SUCTION HOSE
22	540E1604	1	ELBOW
23	645HS	1	NIPPLE
24	545T	1	COUPLER
25	545MM	1	BREATHER
26	645HEG	1	PUMP BRACKET AND CHAIN
27	645HUA	1	GAUGE – OIL LEVEL
28	645HV	1	PIPE PLUG – MAGNETIC
29	560B09175	2	CAPSCREW
30	503R	4	FLAT WASHER
31	560W06S	4	FLAT WASHER
32	645HAAA	1	PUMP SEAL KIT, COMPLETE (NOT SHOWN)
33	645HAAB	1	PUMP SPLINE SEAL
34	645HFA	1	MOTOR SEAL KIT, COMPLETE (NOT SHOWN)
35	645HFB	1	MOTOR DRIVESHAFT DIRT SEAL
36	560W06S	4	FLAT WASHER
37	540T0804	2	TEE
38	540A0810	3	ADAPTER
39	540A1005	2	ADAPTER

6-8L

61780 0221

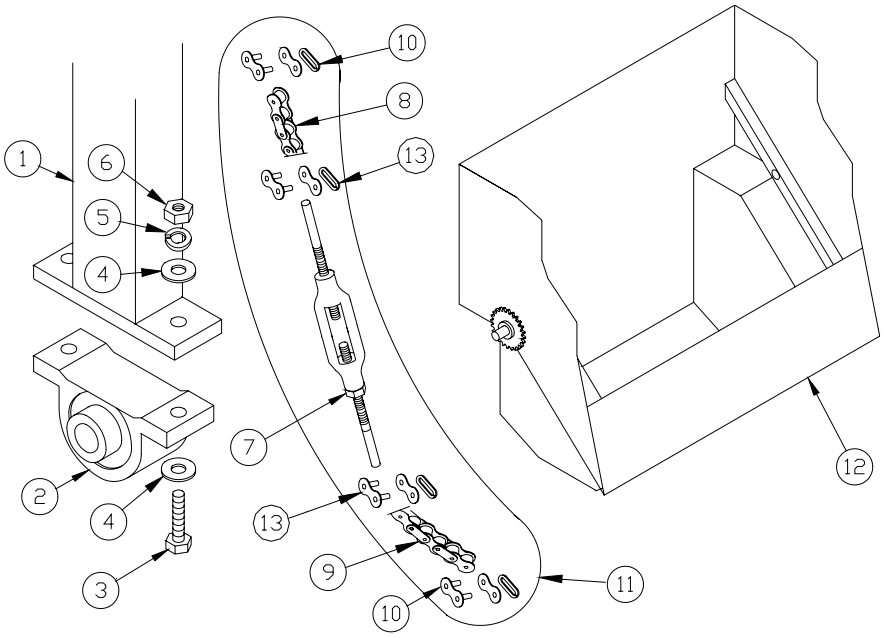
LIFT ARM AND TRIP MECHANISM



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	526	1	TIE BAR
2	523S	2	SET COLLAR
3	524M	2	LIFT ARM ASSEMBLY
4	523AS01	2	SPROCKET (RIGHT SHOWN)
5	508RG	2	GREASE NIPPLE
6	545NN-1	4	PIN
7	523EHD	2	PIN
8	522JT2	2	COTTER PIN
9	545JJH	2	HYDRAULIC CYLINDER
10	545NN	2	PIN
11	502P	6	COTTER PIN
12	545JJF	2	HYDRAULIC CYLINDER
13	545JJFP	2	PACKING FOR 545JJF
14	545JJHP	2	PACKING FOR 545JJE
15	545JJCA	1	SAFETY SUPPORT
16	545JJCF	1	PIN
17	207CM07	1	SNAP PIN
18	503CAP	10	GREASE CAP
19	560B09175	2	CAPSCREW
20	503S	2	HEXNUT

61780 0221

BUCKET AND CHAIN
3 CUBIC YARD HOPPER

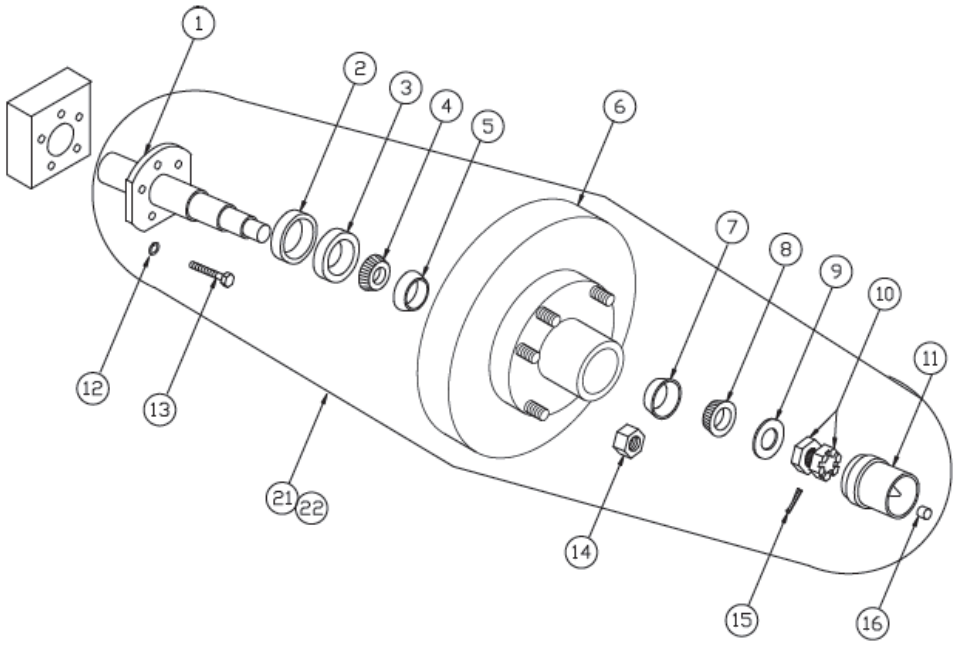


ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	524M	1	LIFT ARM ASSEMBLY
2	225CM02	2	BEARING
3	560B10300	4	CAPSCREW
4	560FW10	8	FLAT WASHER
5	560LW10	4	LOCK WASHER
6	560N10	4	HEX NUT
7	525ZPA	2	TURNBUCKLE
8	525ZPB	2	CHAIN***** SEE BELOW
9	525ZPC	2	CHAIN***** SEE BELOW
10	503NN-4	4	CONNECTING LINK***** SEE BELOW
11	525ZP	2	CHAIN ASSEMBLY***** (ONE SIDE) SEE BELOW
12	525AS01	1	BUCKET
13	503NN-4PF	4	CONNECTING LINK* SEE BELOW

***ONLY USE BARBER CHAIN AND LINKS!**
20,000 LB MINIMUM TENSILE!
CORROSION PROTECTED ON CHAIN AND PINS
SUBSTITUTE CHAINS ARE A SAFETY HAZARD!

61780 0221

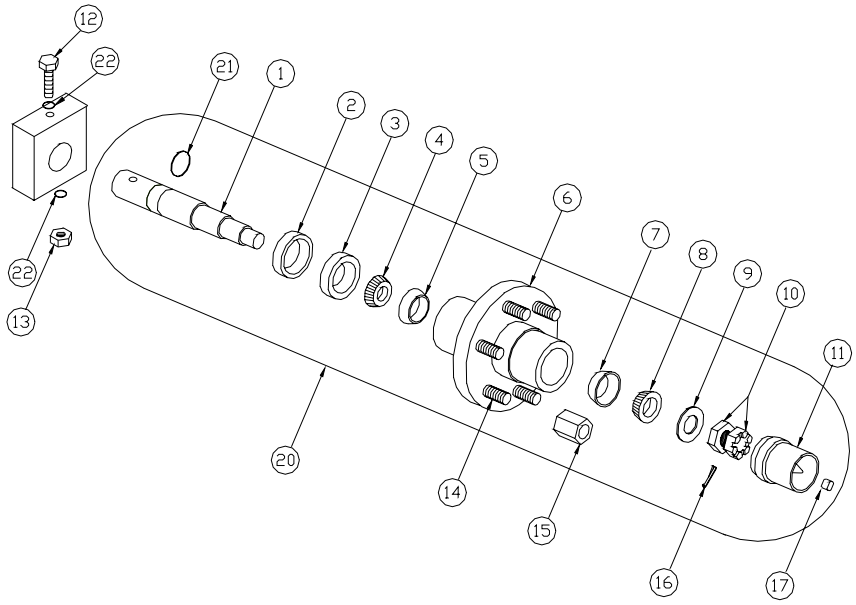
HUB, WHEEL, TIRE, BRAKES



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	527GF-10A	2	SPINDLE WITHOUT FLANGE
2	527GF-11	2	RACE, STAINLESS SLEEVE
3	527GF-6A	2	GREASE SEAL 3.38" OD
4	527GF-1	2	HUB BEARING, LARGE
5	527GF-8	2	RACE, LARGE
6	527GF-12A	2	DRUM WITH RACES, BEARINGS AND SEAL
7	527GF-9A	2	RACE, SMALL
8	527GF-2A	2	HUB BEARING, SMALL
9	527GF-5	2	WASHER
10	527GF-3	2	CASTLE NUT AND RETAINER
11	527GF-4A	2	BUDDY HUB 2441
12	509H	2	LOCK NUT
13	504J	2	CAPSCREW
14	527GF-7A	12	LUG NUT
15	522JT2	2	COTTER PIN
16	503CAP	2	GREASE CAP
17	527HA	2	WHEEL (NOT SHOWN)
18	527KCA	2	TIRE (NOT SHOWN)
19	527GF-13A	-	LEFT BRAKE ASSEMBLY (NOT SHOWN)
20	527GF-14A	-	RIGHT BRAKE ASSEMBLY (NOT SHOWN)
21	527GF-15A	-	LEFT HUB, SPINDLE END UNIT AND BRAKE ASSEMBLY, COMPLETE
22	527GF-16A	-	RIGHT HUB, SPINDLE END UNIT AND BRAKE ASSEMBLY, COMPLETE

61780 0221

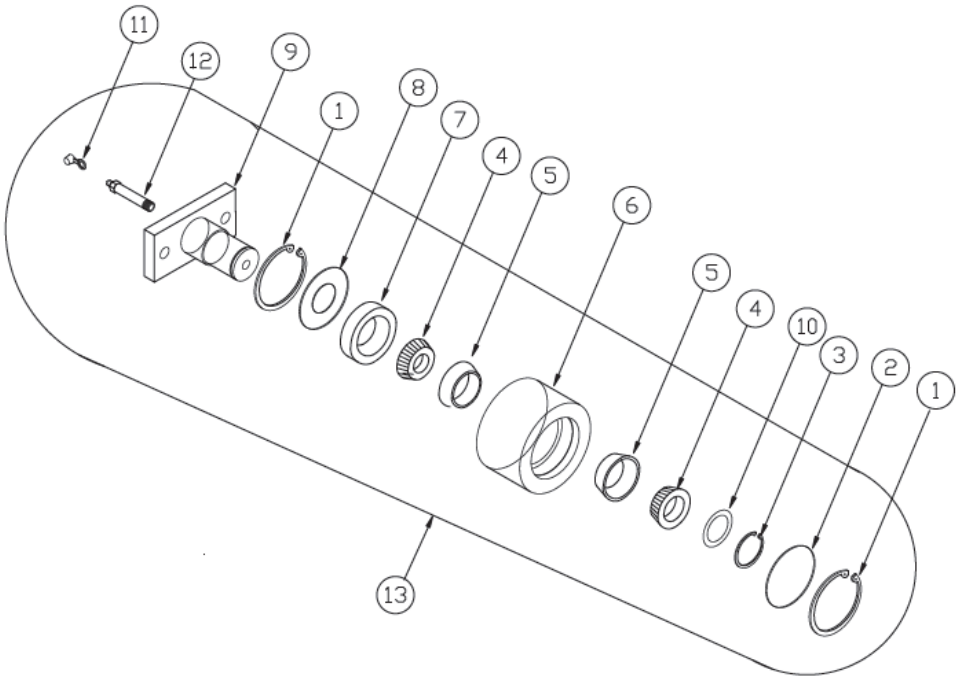
HUB, WHEEL, TIRE



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	527GF-10A	2	SPINDLE WITHOUT FLANGE
2	527GF-11	2	RACE, STAINLESS SLEEVE
3	527GF-6A	2	GREASE SEAL 3.38" OD
4	527GF-1	2	HUB BEARING, LARGE
5	527GF-8	2	RACE, LARGE
6	527GF	2	HUB WITH RACES
7	527GF-9	2	RACE, SMALL
8	527GF-2	2	HUB BEARING, SMALL
9	527GF-5	2	WASHER
10	527GF-3	2	CASTLE NUT AND RETAINER
11	527GF-4A	2	BUDDY HUB
12	560B08475	2	CAPSCREW
13	560N08L	2	LOCK NUT
14	527GF-7PA	12	HUB STUD .563" SPLINE Ø
15	527GF-7B	12	LUG NUT, ALUMINUM WHEEL
16	522JT2	2	COTTER PIN
17	503CAP	2	GREASE CAP
18	527HC	2	WHEEL (NOT SHOWN)
19	527KCA	2	TIRE (NOT SHOWN)
20	A527GFB	2	HUB, SPINDLE END UNIT ASSEMBLY WITHOUT FLANGE
21	527GF-18	1	O RING, LARGE
22	527GF-19	2	O RING, SMALL

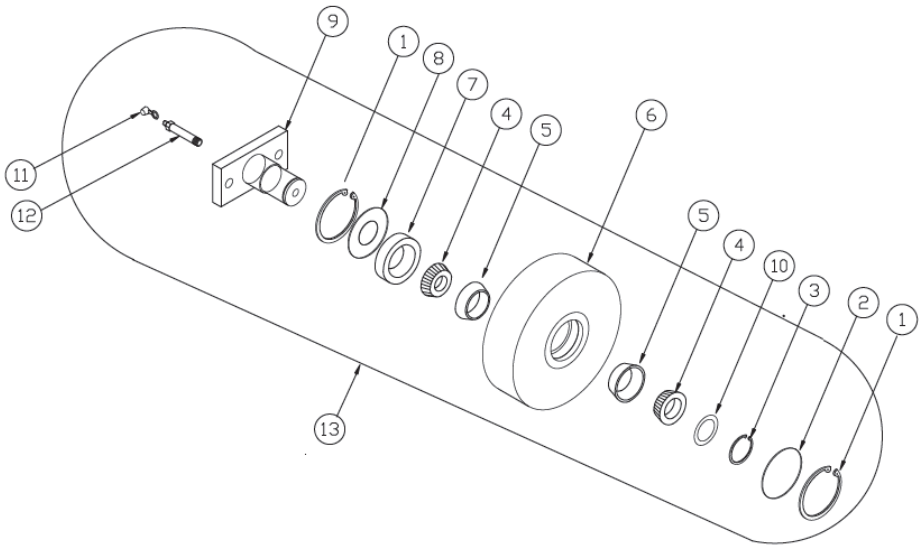
61780 0221

ROLLER ASSEMBLY



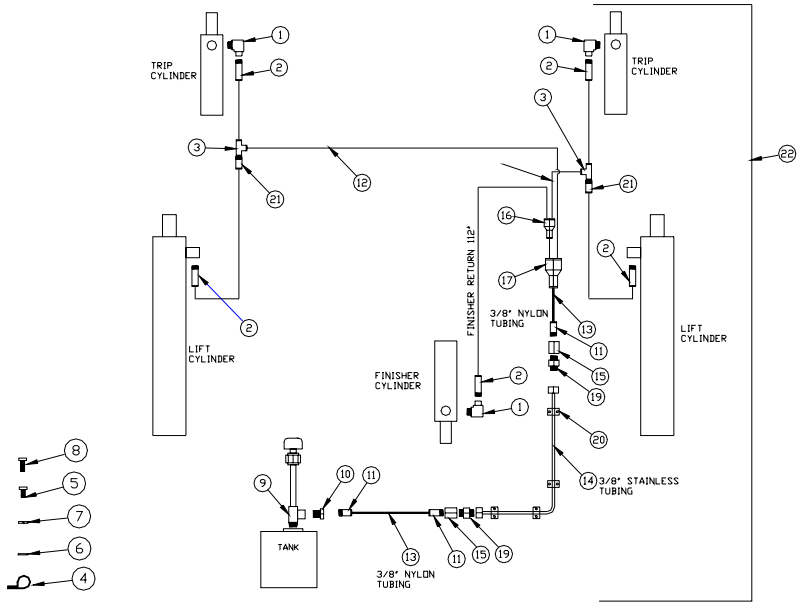
ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	549CM02	2	SNAP RING, LARGE INTERNAL
2	549FM01	1	FRONT COVER PLATE
3	549CM03	1	SNAP RING, SMALL EXTERNAL
4	527GF-2	2	ROLLER BEARING
5	527GF-9	2	RACE
6	549TB01A	1	ROLLER
7	549CM01	1	SEAL
8	549FM02	1	REAR COVER PLATE
9	549AS01	1	PIN AND BASE ASSEMBLY
10	549CM05	2	SHIM
11	503CAP	1	GREASE COVER
12	503ZE01	1	GREASE FITTING
13	549AS10A	1	ROLLER ASSEMBLY, COMPLETE

IDLER ROLLER ASSEMBLY



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	549CM02	2	SNAP RING, LARGE INTERNAL
2	549FM01	1	FRONT COVER PLAET
3	549CM03	1	SNAP RING, SMALL EXTERNAL
4	527GF-2	2	ROLLER BEARING
5	527GF-9	2	RACE
6	549CM08	2	ROLLER
7	549CM01	1	SEAL
8	549FM02	1	REAR COVER PLATE
9	549AS01	1	PIN AND BASE ASSEMBLY
10	549CM05	2	SHIM
11	503CAP	1	GREASE COVER
12	503ZE01	1	GREASE FITTING
13	549AS08	1	ROLLER ASSEMBLY, COMPLETE

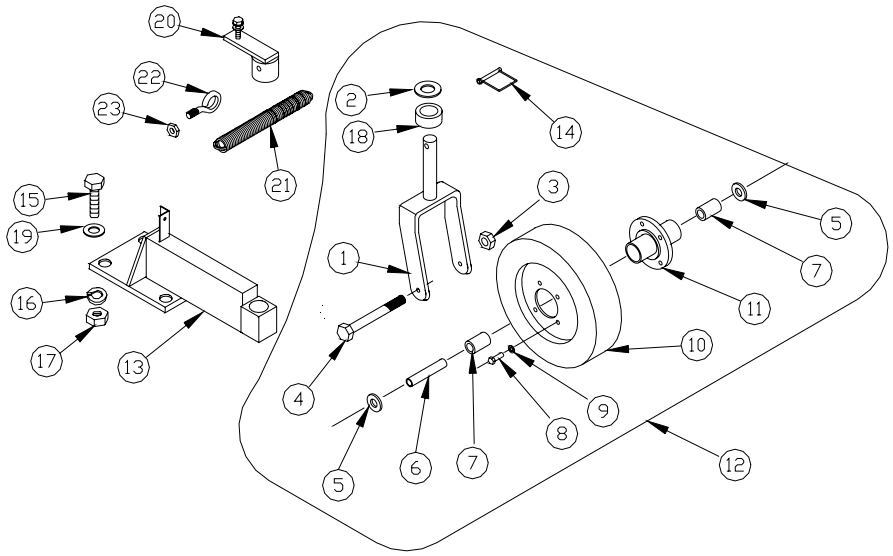
HYDRAULIC RETURN



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS 061219
1	540E0401	3	ELBOW
2	540A0404	5	ADAPTER
3	540T0402	2	MALE RUN TEE
4	540C0802	2	CLAMP, VINYL COATED
5	560B05075	1	CAPSCREW
6	524S	2	FLAT WASHER
7	524Y	2	LOCKWASHER
8	524X	1	CAPSCREW
9	540T1201	1	TEE
10	540R1202	1	ADAPTER
11	540A0612	3	ADAPTER
12	540TB04000	1	NYLON TUBE, 30 FT.
13	540TB06000	1	NYLON TUBE, 3 FT.
14	540B0613	1	TUBING, STAINLESS STEEL
15	540A0615	2	COUPLER
16	540A0406	1	ADAPTER, Y ¼ X ¼
17	540A0613	1	ADAPTER, Y ¼ X 3/8
18	90304005	33	CABLE TIES
19	540A0606	2	ADAPTER
20	540C1015	4	HOSE CLAMP 3/8 TUBE
21	540A0407	2	BULKHEAD FITTING
22	540AS04	1	RETURN LINE ASSEMBLY COMPLTE

61780 0221

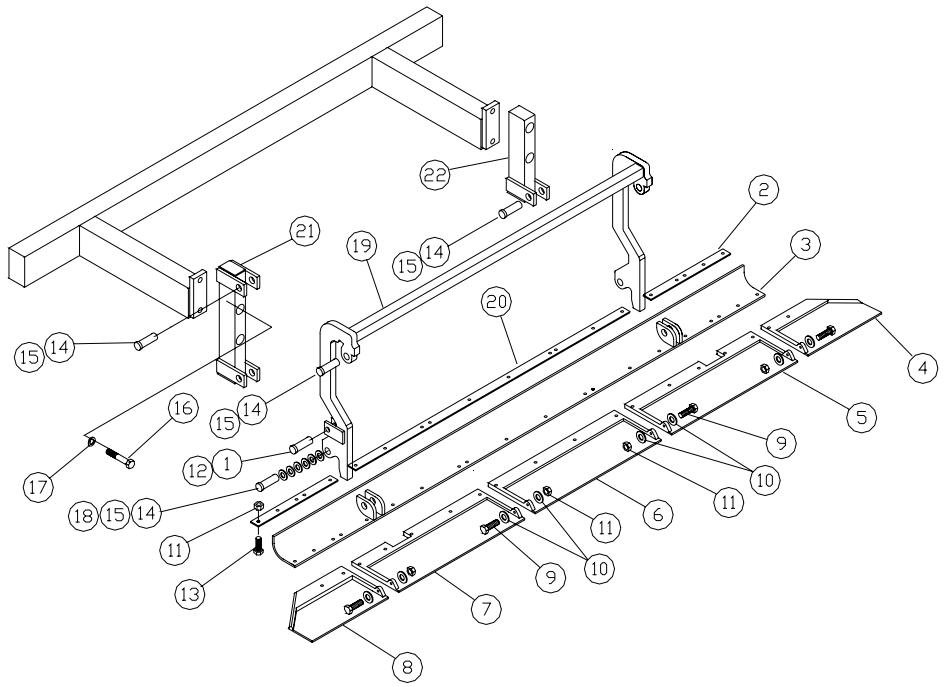
OPTIONAL CASTER ASSEMBLY



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	251A	2	FORK ASSEMBLY
2	251B	4	WASHER
3	509FA	2	LOCK NUT
4	251C	2	BOLT
5	251D	4	WASHER
6	251E	2	SPACER TUBE
7	251F	4	ROLLER BEARING AND RACE
8	560B08100	8	BOLT
9	524G	8	LOCK WASHER
10	251G	2	WHEEL FLANGE AND TIRE ASSEMBLY
11	251H	2	HUB
12	251ASY	2	CASTER ASSEMBLY COMPLETE
13	251JASY	2	CASTER HOLDER
14	552CM11	2	SNAP PIN
15	524D	8	CAPSCREW
16	524G	8	LOCK WASHER
17	523R	8	HEX NUT
18	251TB05	6	SPACER
19	603GG	8	FLAT WASHER
20	251AS01	2	RETAINER CAP ASSEMBLY
21	251TCM07	2	SPRING
22	560B05100E	2	EYEBOLT
23	560N05L	4	NUT

61780 0221

OPTIONAL FINISHER

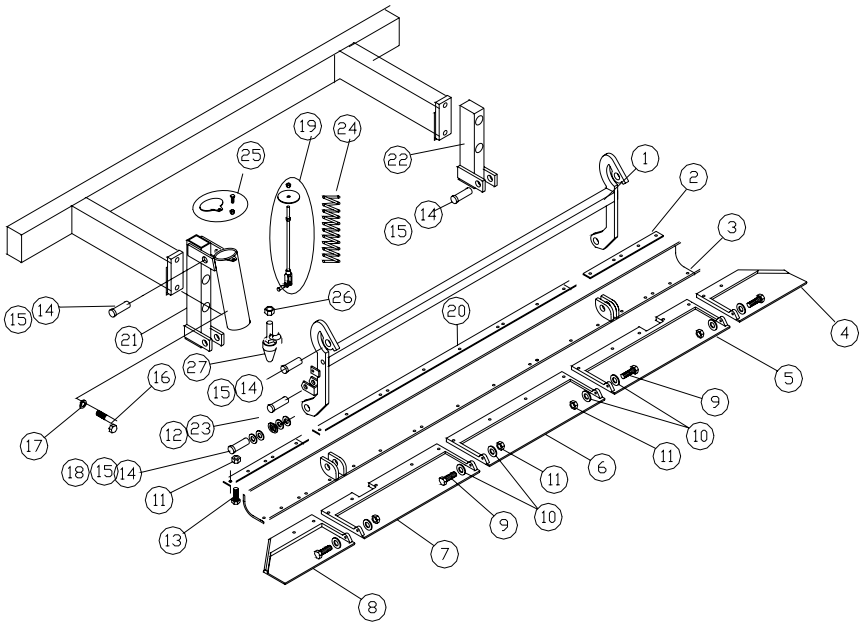


ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	522JT2	1	COTTER PIN
2	530FB01	2	HOLD DOWN BAR
3	530AS06	1	FINISHING PLATE
4	530CM02	1	FINISHER (RIGHT OUTSIDE)
5	530CM05	1	FINISHER (RIGHT INSIDE)
6	530CM03	1	FINISHER (CENTER)
7	530CM04	1	FINISHER (LEFT INSIDE)
8	530CM01	1	FINISHER (LEFT OUTSIDE)
9	560B05175S	4	BOLT
10	524S	8	WASHER
11	560N05LS	22	NUT
12	530CM07	1	PIN
13	560B05175S	18	BOLT
14	560C02150	5	COTTER PIN
15	530CM06	5	PIN
16	509D	4	BOLT
17	560LW12	4	LOCK WASHER
18	502N	6	FLAT WASHER
19	530AS04	1	ARM ASSEMBLY
20	530FB02	1	HOLD DOWN BAR, MIDDLE
21	530AS03	1	TUBE ASSEMBLY
22	530AS12	1	TUBE ASSEMBLY

6-16a

61780 0221

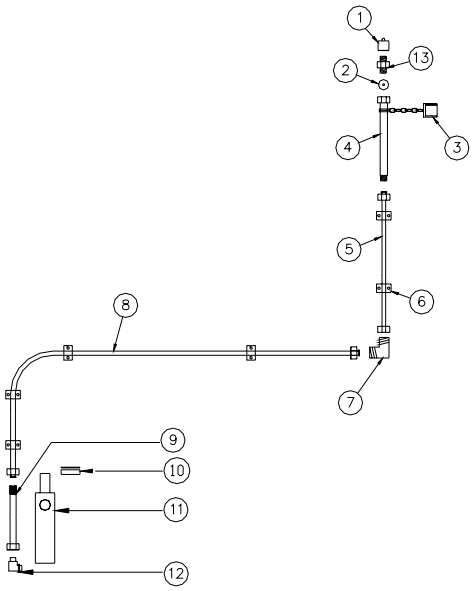
OPTIONAL AUTO FINISHER



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	530AS17	1	ARM ASSEMBLY
2	530FB01	2	HOLD DOWN BAR
3	530AS06	1	FINISHING PLATE
4	530CM02	1	FINISHER (RIGHT OUTSIDE)
5	530CM05	1	FINISHER (RIGHT INSIDE)
6	530CM03	1	FINISHER (CENTER)
7	530CM04	1	FINISHER (LEFT INSIDE)
8	530CM01	1	FINISHER (LEFT OUTSIDE)
9	560B05175S	4	BOLT
10	524S	8	WASHER
11	560N05LS	22	NUT
12	530CM07	1	PIN
13	560B05150	18	BOLT
14	560C02150	5	COTTER PIN
15	530CM06	5	PIN
16	509D	4	BOLT
17	560LW12	4	LOCK WASHER
18	502N	6	FLAT WASHER
19	530AS43	1	SPRING TENSIONER ASSEMBLY
20	530FB02	1	HOLD DOWN BAR, MIDDLE
21	530AS45	1	TUBE ASSEMBLY
22	530AS12	1	TUBE ASSEMBLY
23	522JT2	1	COTTER PIN
24	530CS01	1	SPRING
25	530AS44	1	CAP ASSEMBLY
26	560N12S	1	NUT
27	530AS46	1	RUBBER STOP
28	530AS02	1	AUTO FINISHER ASSEMBLY AND AUTO FINISHER HYDRAULICS ASSEMBLY

61780 0221

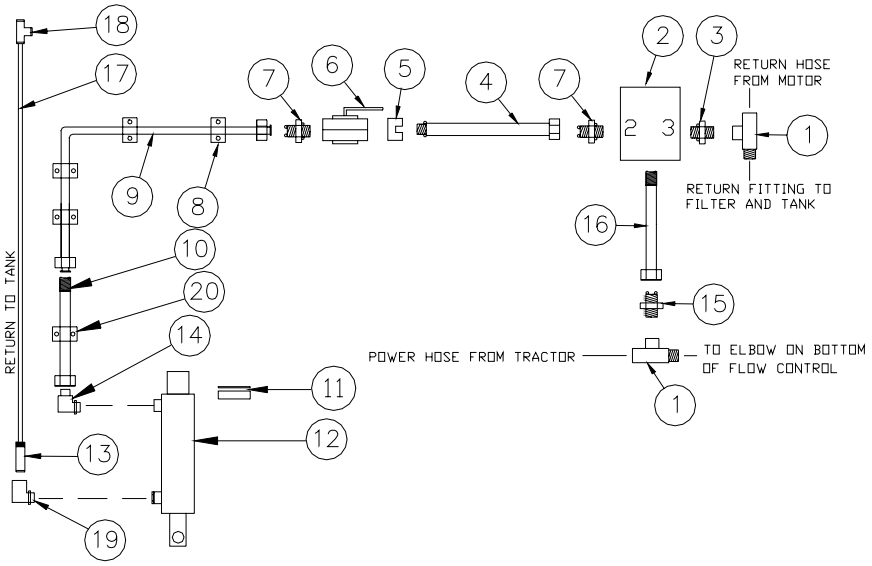
OPTIONAL FINISHER HYDRAULICS



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	540A0809	1	QUICK DISCONNECT, MALE
2	540R08032	1	RESTRICTOR
3	545HD-13	1	QUICK DISCONNECT COVER
4	540H06050	1	HOSE
5	540B0601	1	TUBE
6	540C1001A	10	HOSE CLAMP
7	540E0602	1	ELBOW
8	540B0602	1	TUBE, LEFT
9	540H06130	1	HOSE
10	545JJHP	1	REPLACEMENT SEAL KIT
11	545JJH	1	CYLINDER
12	540E0601	1	ELBOW, 90 DEGREES FOR 2X5 CYLINDER
13	540R0806	1	ADAPTER

61780 0221

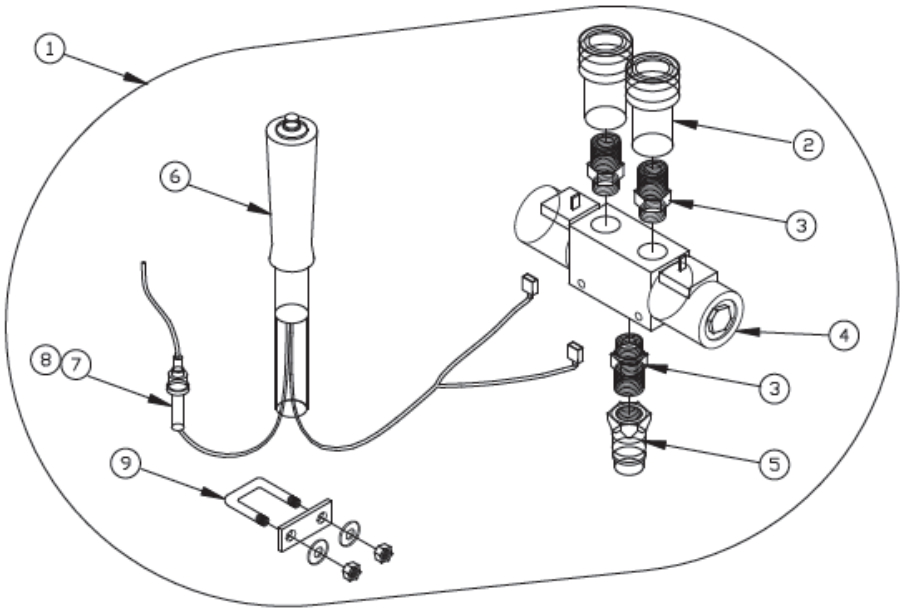
OPTIONAL AUTO FINISHER HYDRAULICS



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	540T0804	2	STREET TEE
2	540V007	1	SEQUENCE VALVE
3	540A0611	1	ADAPTER
4	540H06025	1	HOSE
5	540R4500236	1	ORIFICE PLATE
6	540V004	1	SHUT OFF VALVE
7	540A0602	1	ADAPTER
8	540C1001A	5	HOSE CLAMP
9	540B0602	1	TUBE, LEFT
10	540H06130	1	HOSE
11	545JJHP	1	REPLACEMENT SEAL KIT
12	545JJH	1	CYLINDER
13	540A0404	1	ADAPTER
14	540E0601	1	ELBOW, 90 DEGREE
15	540A0610	1	ADAPTER
16	540H06013	1	HOSE
17	540TB04000	1	TUBE 10’
18	540T0401	1	UNION TEE, TUBE
19	540E0401	1	ELBOW, 90 DEGREE
20	540C1001B	5	HOSE CLAMP
21	530AS02	1	AUTO FINISHER ASSEMBLY AND AUTO FINISHER HYDRAULICS ASSEMBLY

61780 0221

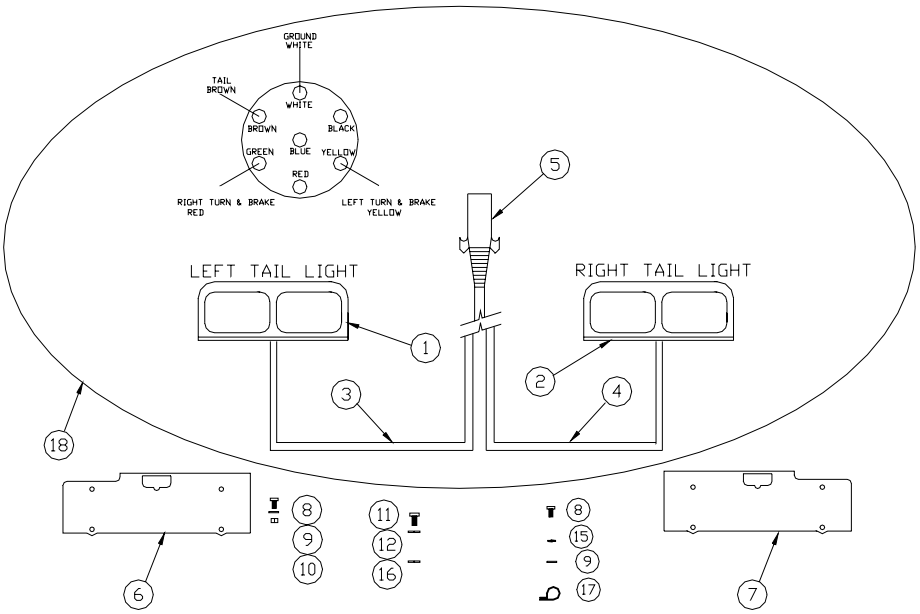
OPTIONAL HYDRAULIC MULTIPLIER



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	540AS01	1	ASSEMBLY KIT COMPLETE – SINGLE ACTING MULTIPLIER
1	540AS05	1	ASSEMBLY KIT COMPLETE – DOUBLE ACTING MULTIPLIER (NOT SHOWN)
2	545HDB	2	QUICK DISCONNECT, FEMALE
3	540A0804	3	ADAPTER
4	540V040	1	VALVE BODY – SINGLE ACTING MULTIPLIER
4	540V008	1	VALVE BODY – DOUBLE ACTING MULTIPLIER
5	545HD-12	1	QUICK DISCONNECT, MALE
6	540V041	1	HANDLE WITH WIRES
7	532CM05	1	FUSE HOLDER
8	540V043	1	FUSE 15 AMP
9	540V044	1	CLAMP KIT

61780 0221

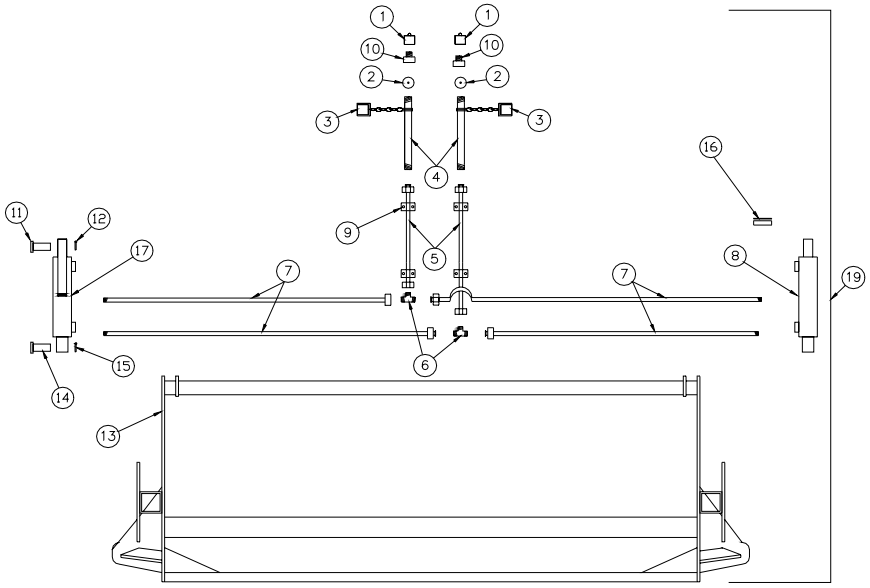
OPTIONAL LIGHTING



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS 061219
1	565CM32	1	STOP, TURN, TAIL LIGHT
2	565CM33	1	STOP, TURN, TAIL LIGHT
3	565CM34	1	HARNESS, LEFT
4	565CM35	1	HARNESS, RIGHT
5	565CM06	1	SEVEN WAY PLUG, ROUND
6	565BU04L	1	LEFT LIGHT BRACKET
7	565BU04R	1	RIGHT LIGHT BRACKET
8	560B04100	10	CAPSCREW
9	560W04	18	FLAT WASHER
10	560N04L	10	LOCKNUT
11	524X	4	CAPSCREW
12	524Y	4	LOCKWASHER
13	90304005	24	TIE STRAPS (NOT SHOWN)
14	565CM09	1	WIRE LOOM (NOT SHOWN)
15	520P	2	LOCKWASHER
16	524S	4	FLAT WASHER
17	565CM16	2	HOSE CLAMP
18	565AS21	1	LIGHTS/HARNESS/PLUG ASSEMBLY COMPLETE
19	565I001	1	STROBE LIGHT (OPTIONAL) NOT SHOWN
20	565I14	1	LICENSE LIGHT (OPTIONAL) NOT SHOWN

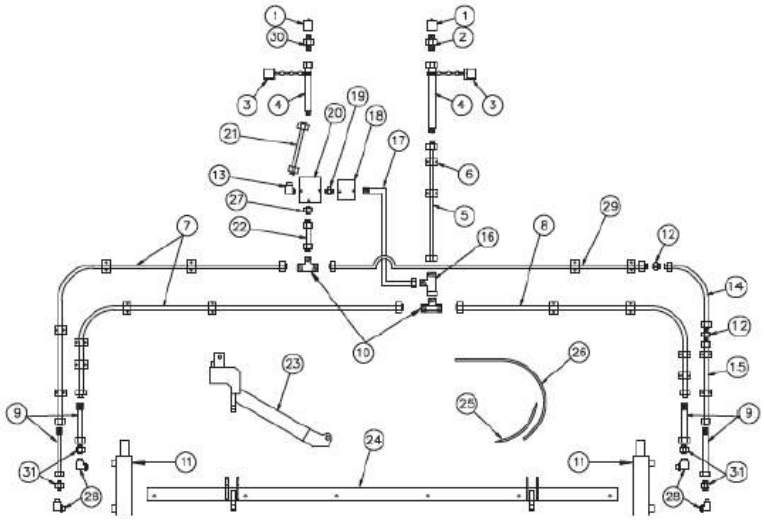
61780 0221

OPTIONAL HYDRAULIC MOLDBOARD



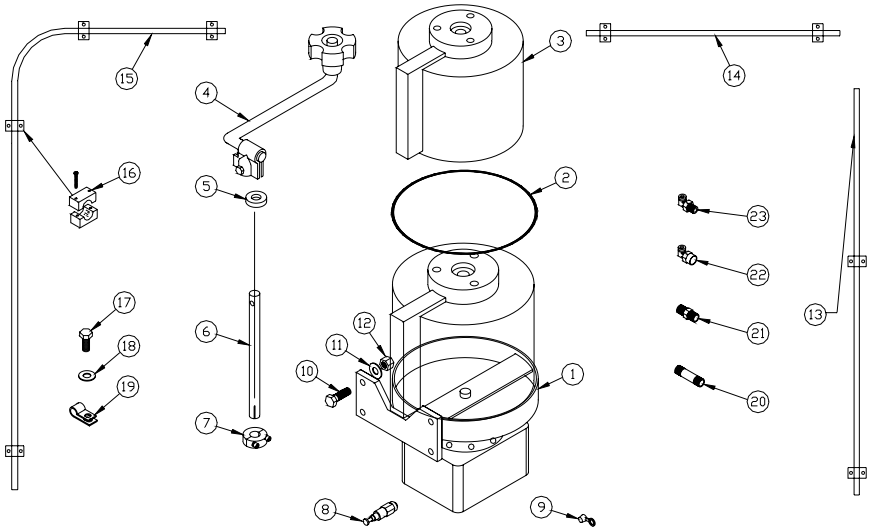
ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	540A0809	2	QUICK DISCONNECT, MALE
2	540R08032	2	ORIFICE DISC
3	545HD-13	2	QUICK DISCONNECT COVER
4	540H06050	2	HOSE
5	540B0601	2	TUBE
6	540T0602	2	TEE
7	540H06035	4	HOSE
8	545JJH	1	CYLINDER
9	540C1001	4	HOSE CLAMP
10	540R0806	2	ADAPTER
11	530CM07	2	PIN
12	522JT2	2	COTTER PIN
13	522AS02	1	MOLDBOARD
14	530CM06	2	PIN
15	560C02150	2	COTTER PIN
16	545JJHP	1	REPLACEMENT SEAL KIT PER CYLINDER
17	545JJHG	1	CYLINDER WITH HEIGHT BAR/GAGE
18	558HYDMLBD	1	CYLINDER DECAL (NOT SHOWN)
19	522AS03	1	HYDRAULIC MOLDBOARD ASSEMBLY, COMPLETE

OPTIONAL CHICAGO RAKE



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	540A0809	2	QUICK DISCONNECT, MALE
2	540R08032	1	RESTRICTOR
3	545HD-13	2	QUICK DISCONNECT COVER
4	540H06050	2	HOSE
5	540B0601	1	TUBE
6	540C1001	16	HOSE CLAMP
7	540B0602	2	TUBE, LEFT
8	540B0603	1	TUBE, RIGHT
9	540H06130	4	HOSE
10	540T0602	2	TEE
11	530CUPMC19408	2	CYLINDER
12	540A0609	2	ADAPTER
13	540E0601	1	ELBOW, 90 DEGREE
14	530CUH06035	2	HOSE
15	540B0604	1	TUBE
16	540T0604	1	RUN NUT TEE
17	540H06035	1	HOSE
18	530CUCV01	1	CHECK VALVE
19	540A0601	1	ADAPTER
20	540V070	1	PRESSURE REDUCING VALVE
21	540B0606	1	TUBE
22	540B0607	1	TUBE
23	530CUAS03	2	ARM ASSEMBLY
24	530CUAS02	1	TUBE ASSEMBLY
25	530CU572005	6	TINE END
26	530CU571005	6	TINE
27	540A0602	2	ADAPTER
28	540E0604	4	STREET ELBOW
29	540B0608	1	TUBE
30	540R0806	1	ADAPTER
31	540A0606	4	ADAPTER
31	21875	12	CARRIAGE BOLT
33	1137266	12	TOP LOCK NUT
34	33814	6	HARDENED WASHER
35	13360	4	CAPSCREW
36	13319	6	CAPSCREW
37	560N10L	6	TOP LOCK NUT
38	560FW10	4	WASHER
39	509D	2	CAPSCREW
40	509FA	6	LOCK NUT
41	530CUAS01	1	CHICAGO RAKE 6 – ASSEMBLY COMPLETE

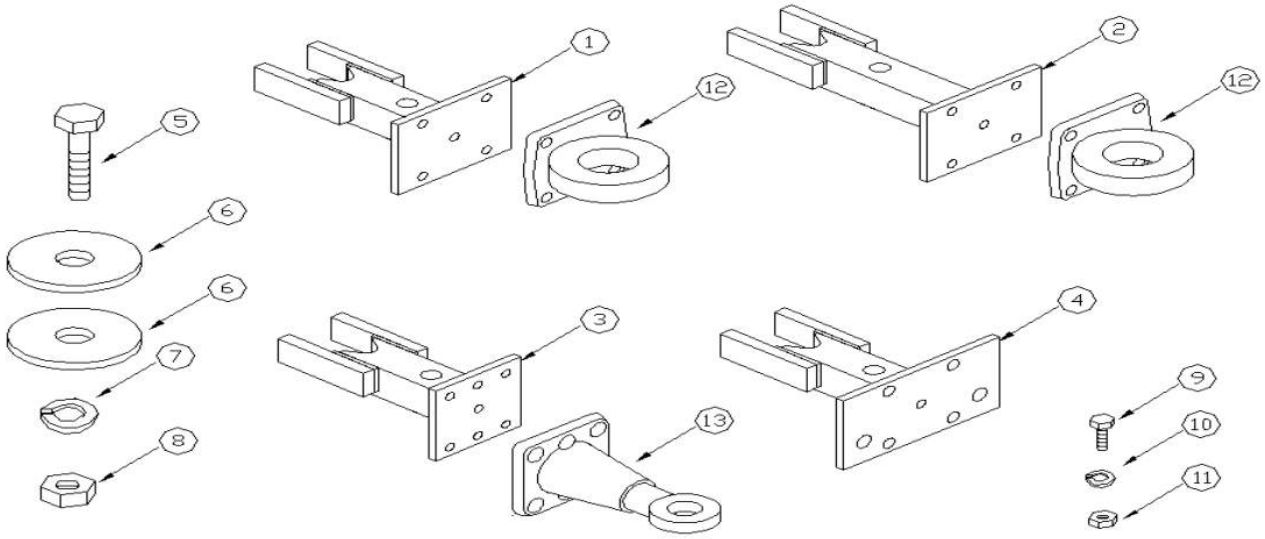
MANUAL GREASE SYSTEM



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	532AS10	1	MANUAL AUTO GREASE UNIT
2	532CM08	1	RESEVOIR O-RING
3	532AS10E	1	COVER ASSEMBLY
4	532AS10D	1	HANDLE ASSEMBLY
5	532AS10F	1	SEAL
6	532AS10C	1	STAINLESS ROD
7	532AS10G	1	COLLAR
8	532CM03	12	INJECTOR CARTRIDGE
9	503CAP	1	GREASE CAP
10	524X	4	CAPSCREW
11	524S	4	FLAT WASHER
12	560N05L	4	LOCKNUT
13	532TB06	1	STAINLESS TUBING, RIGHT
14	532TB04	1	STAINLESS TUBING, FRONT/RIGHT
15	532TB02	1	STAINLESS TUBING, LEFT
16	540C1001	8	HOSE CLAP 5/8”
17	520K	6	CAPSCREW
18	520P	6	LOCKWASHER
19	540C0401	6	STRAP CLAMP
20	540N0204	8	NIPPLE
21	503AHB	2	NIPPLE
22	532CM04	10	PUSH TO CONNECT SOLID FEMALE FITTING
23	532CM02	2	PUSH TO CONNECT SWIVEL MALE FITTING
24	532TBR164	12	GREASE LINE (NOT SHOWN)
25	532AS02	1	COMPLETE MANUAL AUTO GREASE SYSTEM

61780 0221

OPTIONAL PINTLE ATTACHMENT



ITEM	PART NUMBER	QTY	DESCRIPTION 600HDS
1	552AS01	1	STANDARD PINTLE ATTACHMENT
2	552AS01L	1	EXTENDED STANDARD PINTLE ATTACHMENT
3	552AS01E	1	EUROPEAN PINTLE ATTACHMENT
4	552AS01A	1	AUSTRALIAN PINTLE ATTACHMENT
5	560B16600	1	CAPSCREW
6	502N	2	FLAT WASHER
7	405F	1	LOCK WASHER
8	405G	1	HEX NUT
STANDARD AND EXTENDED STANDARD PINTLE ADAPTER			
9	506B09250	4	CAPSCREW
10	503R	4	FLAT WASHER
11	506N09L	4	LOCK NUT
12	552CM01	1	TOW EYE
EUROPEAN PINTLE ADAPTER			
9	506B09250	6	CAPSCREW
10	503R	6	FLAT WASHER
11	506N09L	6	LOCK NUT
13	552CM02	1	EUROPEAN TOW EYE

61780 0221

BeachTech®

SIMPLE PRINCIPLE – MAJOR EFFECT

BeachTech screening machines remove unwanted objects and potential dangers from sand and screenable soil – and by doing this, they make the environment cleaner and safer.

Ready to REMOVE

Versatile:
BeachTech screening machines can be used in a variety of application areas.

Thorough:
BeachTech machines can remove objects that are on and underneath the surface.

Powerful:
BeachTech cleans areas of up to 30,000 m^2 per hour.

Economical:
Our extensive product portfolio offers the right model for cleaning areas of any size in a way that saves time and money.

Simple:
BeachTech screening machines are easy to operate.

Durable:
The rugged and high-quality design gives our machines a long service life.

BeachTech®

COMPATIBLE WITH A VARIETY OF USES

BeachTech offers solutions for efficient and thorough beach cleaning. Even when not on the beach, our screening machines can remove nuisance and dangerous objects from the soil.

Beaches

- Clean and hygienic beaches
- Safe vacation experience for your guests
- Efficient and thorough cleaning, even below the surface

Playgrounds and sports grounds

- No worry for parents – kids can play safely
- Sand quality is improved without being replaced
- Looks well-maintained

Equestrian sport

- Stones and other dangerous objects are reliably removed
- Clean soil is safer for horses and riders
- Preserves the soil quality through removal of weeds

Sod

- Removal of fine stones keeps sod stone-free for a long time
- Higher quality of the sod rolls
- Reduced wear on harvesting machines

Agriculture

- Do away with herbicides by removing weeds mechanically
- Stone-free soil is gentler on your harvesting machines and reduces wear and costs
- Higher yield and better quality of the crop

Water filtration retention ponds, golf courses and shooting ranges

- Cleaning water filtration retention ponds
- Cleaning golf course bunkers
- Collecting munitions at shooting ranges

THOROUGH CLEANING

BeachTech screening machines remove small contaminants, such as cigarettes, bottle caps and broken glass. Even larger objects, such as plastic bottles, floating refuse and seaweed, and vegetation and stones, are removed.

Removes everything:

Thanks to various screen sizes, BeachTech screens out small particles as well as larger objects.

Deep-reaching:

BeachTech penetrates up to 30 cm below the soil surface to pick up contaminants and screen them out.

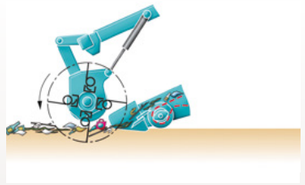
Flexible:

Thanks to our cleaning systems, various machine sizes and flexible options for setting the working depth, BeachTech offers the right solution for any operating conditions.

Rugged:

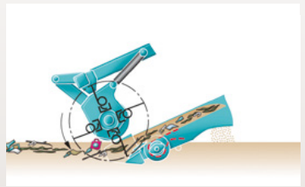
Due to their rugged design, the machines are unscathed by stones, salt water and abrasive sand.

CLEANING TECHNOLOGY FOR ANY SOIL COMPOSITION



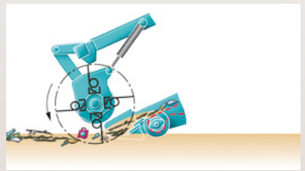
Raking technique

- Enables high working speed
- Cleans the top layer of sand
- Enables cleaning even when the sand is wet or heavy



Screening technique

- Cleaning down to a depth of 30 cm
- Even the smallest particles are removed
- Enables cleaning when the sand is fine-grained or dry

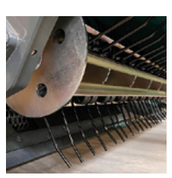


Combined cleaning technology

- Stepless changing between the raking and screening techniques depending on the soil composition; this means you always get the best cleaning results

Pick-up blade:

The screenable soil and contaminants within it are picked up.

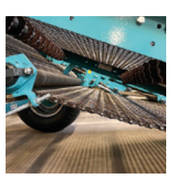


Pick-up blade, pick-up roller with spring tines

Pick-up blade with transport system unit

Screening unit:

The sand-waste mixture is transported to a screening unit. The clean sand falls back to the ground.



Screening belt

Screening sheet metal

Hopper:

Everything that has been screened out is transported into the hopper and can then be conveniently dumped.

Hopper with debris

Finisher:

The finisher smooths the surface and leaves behind a homogeneous structure.

Finisher

OVERVIEW OF MODELS

Self-propelled screening machines

Agile: Due to its three-wheel design, the machine can turn on a dime.

Comfortable: The air-conditioned cab has ample room and storage space. Working long shifts is no problem thanks to the ergonomic driver's seat.

Easy to operate: The joystick and control panel make it easy to operate all the functions. The camera system lets you to keep an eye on the area behind the machine as well as the screening unit and the waste container at all times.

	Engine power	Working width	Waste container volume	Area coverage
BeachTech 5500	55 kW | 74 hp (2,400 U/min)	1,600 mm	1.5 m^3	up to 17,000m^2

Tractor Towed screening machines

You are covered: The towed BeachTech machines cover areas at a rate of up to 30,000 m^2 per hour and are ideal for cleaning surfaces of any size.

Works with your vehicle fleet: Depending on the model, the screening machines can be hitched to tractors with 30 metric HP or more.

Up for the challenge: Thanks to the various cleaning technologies and different screen sizes, you achieve the best cleaning results under all operating conditions.

	Engine power	Working width	Waste container volume	Area coverage
BeachTech 3000	from 74 kW | 100 hp	2,500 mm	4.7 m^3	up to 30,000 m^2
BeachTech 2500	from 59 kW | 80 hp	2,500 mm	2.8 m^3	up to 30,000 m^2
BeachTech 2000	from 55 kW | 70 hp	1,850 mm	1.5 m^3	up to 22,200 m^2
BeachTech 1500	from 55 kW | 70 hp	1,600 mm	1.5 m^3	up to 17,000 m^2
BeachTech 1000	from 22 kW | 30 hp	1,250 mm	0.4 m^3	up to 7,500 m^2

Walk-behind screening machines

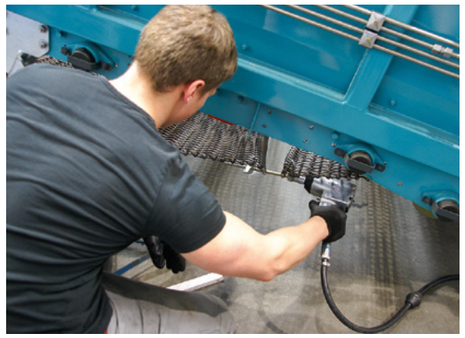
No stone unturned: These practical models turn on a dime and effortlessly maneuver around obstacles.

Meticulous: The screen with particularly fine mesh removes even the smallest dirt particles.

Multifunctional: A wide variety of available attachments turns your Sweepy into a sweeper, mower and much more in no time.

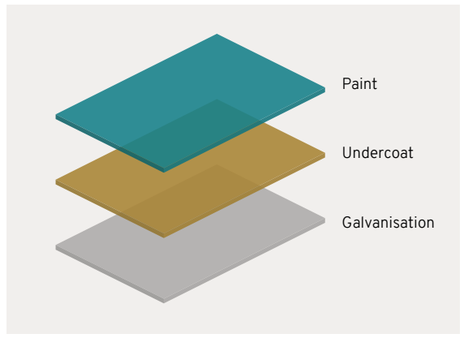
	Engine power	Working width	Waste container volume	Area coverage
BeachTech Sweepy	7.1 kW | 9.6 hp	1,050 mm	44 l	up to 4,200 m^2
BeachTech Sweepy Hydro	7.1 kW | 9.6 hp	1,050 mm	44 l	up to 4,200 m^2

WHY CUSTOMERS TRUST BEACHTECH



Maintenance-friendly

The use of high-quality components and low-maintenance bearings decreases service costs and downtime during the season. The increased efficiency saves you both time and money.



Corrosion protection

The BeachTech models have been built to withstand the extreme conditions of salt water, sand and high humidity. The combination of galvanization and paint layers ensures our machines have a long service life.

Worldwide service

With more than 130 service stations worldwide, our dedicated team is on hand with help and advice for you if service is needed.

Certified quality

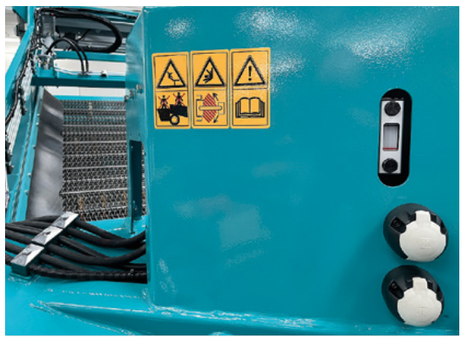
All BeachTech products are CE certified and therefore fulfill the highest safety standards. Kässbohrer Geländefahrzeug AG is ISO 9001- and ISO 14001-certified.

Road certification

Our vehicles can be certified for road use in many countries either individually (with an existing expert's report) or by means of an EU type approval.

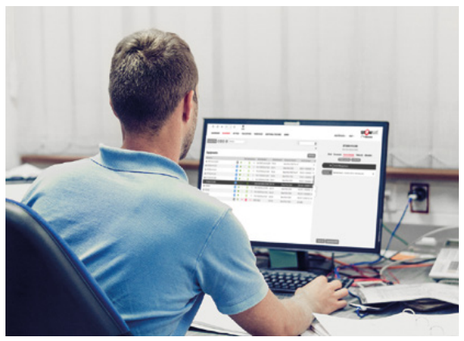
Spare parts

You can conveniently order spare parts at any time from our online shop. Thanks to the high spare part availability in our warehouse and worldwide express shipping, you get the parts when you need them.



Vehicle safety

Your safety is our top priority: Our audio warning system alerts you to malfunctions, such as low oil level, high temperature or overpressure. The waste container is secured by load retaining valves during maintenance and dumping, and pressure relief valves protect your hydraulics. All danger zones are marked.



Digitalization

All cases of maintenance and service on our vehicles are seamlessly documented in our digital service portal. There, you can also find operator's manuals and maintenance instructions, customer information, online training videos and many additional functions, which simplify your maintenance processes.

COMPREHENSIVE SOLUTIONS FOR THE ENVIRONMENT AND TERRAIN

For more than 30 years, BeachTech has been the world's leading provider of machines for cleaning beaches, coasts and screenable soil. Our goal here is to offer our customers reliable solutions they can use to create clean and safe environments for both humans and animals.

As part of Kässbohrer Geländefahrzeug AG, we benefit from many years of experience in developing and manufacturing off-road machines. We are continuously improving by listening, asking questions and making adjustments. We offer our customers innovative products, which are created based on their requirements. In the process, we always make sure that our actions are sustainable. For example, we use wide-base tires for BeachTech to minimize the ground pressure and ensure that the machines do not damage the sand or soil during operation. In addition, our BeachTech machines can be filled with biodegradable hydraulic oil. Likewise, Kässbohrer Geländefahrzeug AG relies on alternative fuels, such as HVO, for its other products, on renewable energies at our locations and on coordinated training programs to ensure that our products are used in a manner that conserves resources.

KÄSSBOHRER GELÄNDEFAHRZEUG AG

Brands

Those brands are part of the Kässbohrer company:

BeachTech®

Machines for cleaning sand and screenable soil

PowerBully

All-terrain tracked vehicles for transporting heavy payloads through rough terrain

PistenBully®

Snow groomers for the preparation of ski slopes and cross-country ski trails

snowsat®
SOLUTIONS FOR DIGITAL SKI WORLDS

Cross-domain digital solutions for the skiing industry

PRO ACADEMY

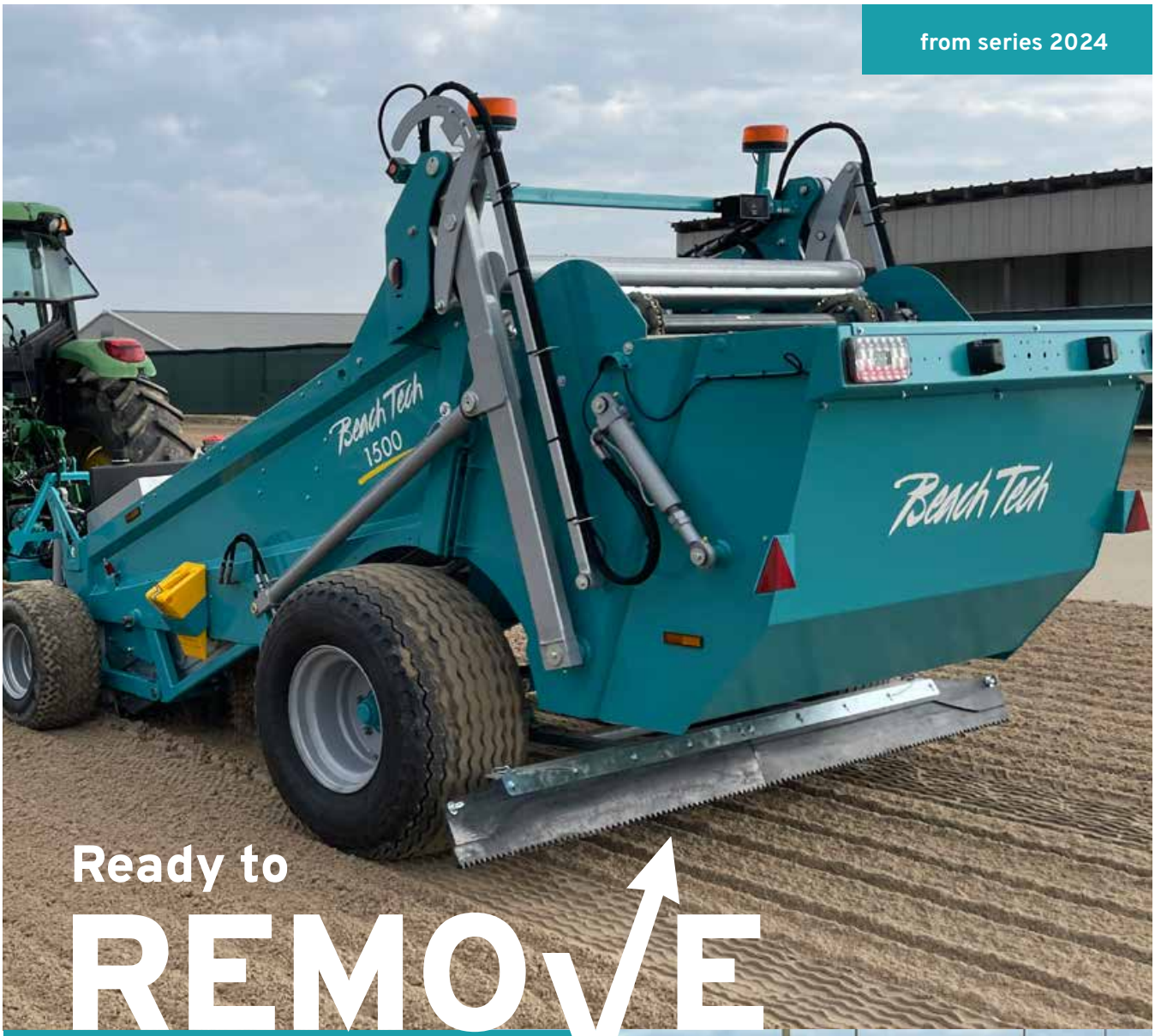
Training and consulting for the sustainable use of our products

COMPOSITES

Manufacturer for fiber composite materials


EN 150.10/2023.el.PK.700
Ready to
REMOVE
Kässbohrer Geländefahrzeug AG
Kässbohrerstraße 11
88471 Laupheim
Phone +49 (0)7392 900-0
info@beach-tech.com
www.beach-tech.com
BeachTech is a registered trademark of Kässbohrer Geländefahrzeug AG. Changes to the product may have occurred after this publication was approved for print. The images also include accessories and optional equipment that are not part of the standard scope of delivery. The printing process may cause deviations in color. Statements on statutory, legal and tax-related regulations and the implications thereof are valid for the Federal Republic of Germany only. Therefore, please ask your contact person at Kässbohrer Geländefahrzeug AG for the latest binding developments. Printed in Germany on chlorine-free-bleached paper.
BeachTech®

from series 2024



Ready to

REMOVE

TECHNICAL SPECIFICATIONS

BeachTech 1500

BeachTech®

BeachTech 1500

Engine power
from 55 kW | 70 hp

Working width
1.600 mm

Hopper volume
1,5 m³

Area coverage
up to 19.000 m²/h

Cleaning method	**Screening technique with vibrating screen and transport system**	
Tractor requirements	**Engine power min.****	55 kW (70 hp)
	Four-wheel drive	
	differantial lock	
	Tires	480 mm front, 520 mm back
	3-point hitch, cat. 2	
	PTO shaft	Z6, 1 3/8“
	power take-off, AR NORM	540 rpm
	power supply	standardized socket, 12 V
Dimensions	**vehicle length, road transport**	5.430 mm
	vehicle width, road transport	2.480 mm
	working width	1.600 mm
	vehicle height	2.430 mm
	Unloading height collecting hopper	0 – 2.600 mm
Tires	**low pressure tires, wide**	520/50 – 17
Weight	**Empty weight**	3.120 kg
	technically permissible total weight*	4.500 kg
Tank capacity	**hydraulic oil**	80 l
Performance	**area coverage up to****	19.000 m²/h
working depth	**working depth up to****	15 cm
Capacity	**collecting hopper**	1,5 m³
Speed	**operating speed max.****	12 km/h
	road traffic*	25 / 40 km/h

* according to local traffic regulations ** depending on soil / beach conditions

Subject to change in the course of technical development. The images shown are for illustration purposes only and may may contain optional extras.

dealer stamp

BeachTech®
Tel.: +49 7392 900 - 461
E-Mail: info@beach-tech.com
www.beach-tech.com

BeachTech®
2000

TECHNICAL SPECIFICATION

(from series 2018 on)

KÄSSBOHRER GELÄNDEFAHRZEUG AG

BeachTech 2000

Data sheet

Cleaning method		BechTech 2000
	patented	raking-screening-mixed technique
Tractor requirements		
	minimum power output	55 kW / 70 hp
	4-wheel-drive	
	differential lock	
	high flotation tires, width	480 mm front, 520 mm back (sand tires)
	2-point hitch, cat. 2	
	PTO shaft	6 spline (21 spline), 1 3/8"
	power take-off AR NORM	540 rpm (1000 rpm)
	2 double-acting circuits of the additional tractor hydraulics in standard operation	
	electrical circuit	standardized socket, 12 V
Dimensions		
Length		5.430 mm
Width	small tires	2.300 mm
	wide tires	2.610 mm
	incl. finisher	2.500 mm
	working width	1.850 mm
Height	vehicle	2.100 mm
	unloading hopper	2.600 mm
Tires		
	small	360/70-16
	wide, low pressure	520/50-17
Weight		
	net weight	1.800 kg
	gross weight limit up to*	2.800 kg
Tank capacity		
	hydraulic oil	30 l
Performance		
	ground coverage up to	22.200 m²/h
Working depth		
	up to**	30 cm
Screen surface		
	screening belt	+/- 4 m²
Capacity		
	collecting hopper	1,5 m³
Speed		
	max. working speed**	12 km/h
	traffic *	25 km/h // 40 km/h

Specifications *according to local traffic regulations; **depending on nature of the ground; Optional road licensing, according to local traffic regulations, possible.

The possibility of changes to the product after the editorial closing date for this publication cannot be ruled out.

Dealer stamp

BeachTech®
Tel.: +49 7392 900 - 461
Email: info@beach-tech.com
www.beach-tech.com

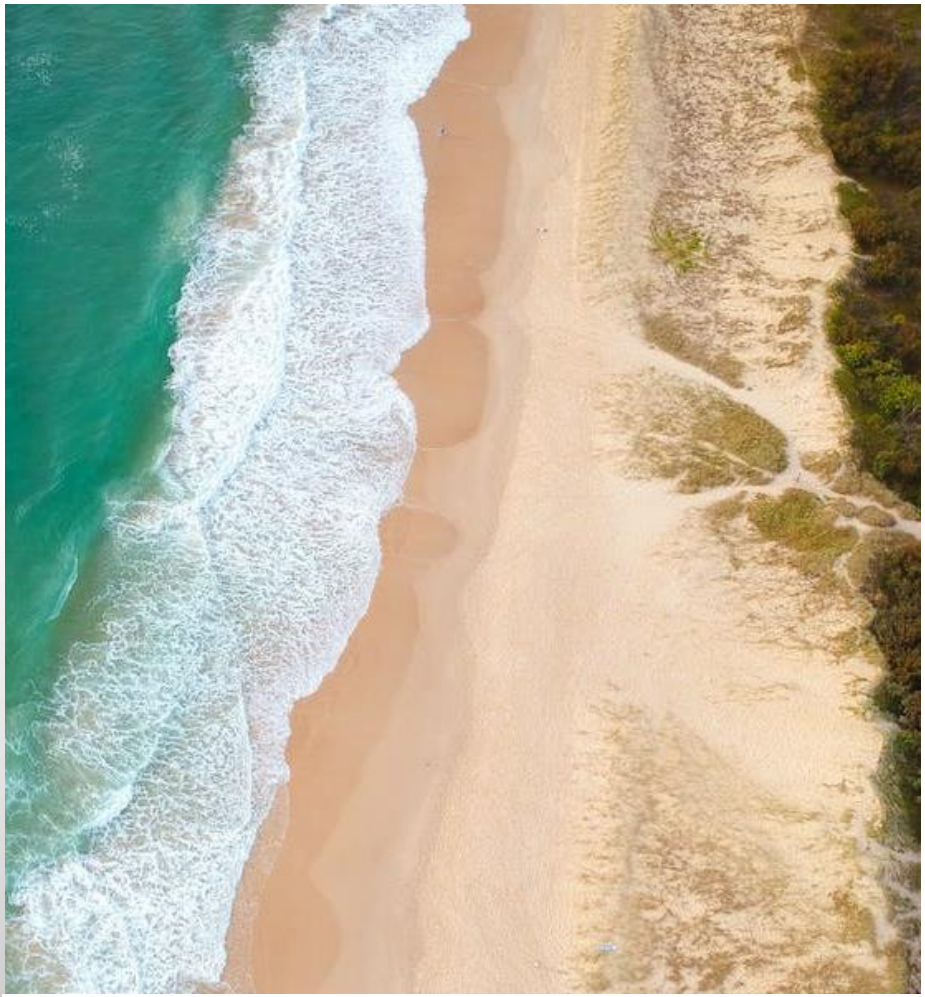
Introducing Clean Coast Solutions

Mark Ryan – Founder

Welcome to Clean Coast Solutions, a company with a vision to create a cleaner and more sustainable coastline through the use of innovative technology.

Clean Coast Solutions aims to offer councils and land management bodies an advanced beach cleaning service that is not only more efficient but also minimizes environmental harm compared to traditional methods.

We also intend to extend our services to coastal sustainability stewardship and education and actively adopting a circular economy approach to the disposal of all collected waste.



CLEAN COAST SOLUTIONS
The Coastal Sustainability Company

A little about me (The Who)

- Aerospace & Systems Engineer with 13 years experience in aircraft structures and complex system design.

- Passionate about environmental sustainability and a lover of all things salt water.

The Why

The catalyst for all of this was witnessing our newborn playfully sifting through the sand, only to find her chewing on tiny pieces of plastic.

I was aware that the beaches in our LGA were mechanically cleaned, so I was left wondering how so much plastic remained, often buried out of sight……

The engineer in me set about finding the root cause and coming up with a solution

The Micro-Plastics Problem

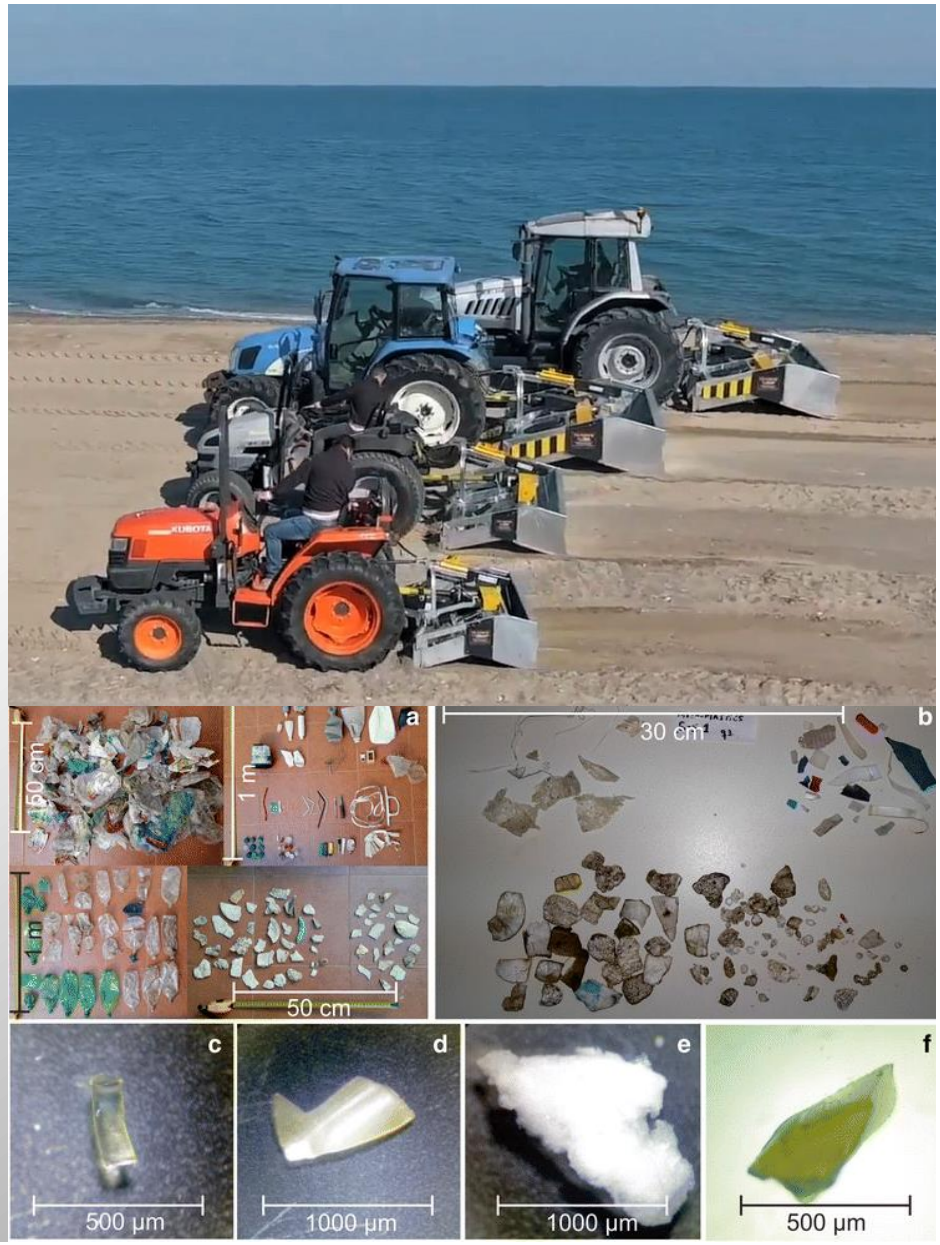
- Meso & Microplastics, tiny plastic particles smaller than 25mm, are pervasive pollutants found in oceans, rivers, and even the air.
- They result from the fragmentation of larger plastics or are intentionally produced for cosmetics, textiles, and industrial processes.
- Microplastics pose ecological threats as they are ingested by marine life, entering the food chain and potentially harming human health.
- Their small size and ubiquity make them challenging to remove using conventional methods, necessitating innovative solutions.
- Local studies have indicated that the prevalence of microplastics in our ecosystem is only going to increase.
- The increasing economic impact of the issue is only now being realised too.

The Problem with Existing Beach Cleaning Operations

- Collection of waste >25mm ✓
- Collection of waste <25mm (Meso and Micro-plastic) ✗

Additional concerns

- Pulled by diesel tractors ✗
- Costly to procure, operate and maintain ✗
- Contribute to beach noise and carbon emissions. ✗
- Oil and grease deposits from machinery. ✗
- Limited access to beaches without ramps. ✗
- Heavy - Compression of sand contributes to coastal erosion. ✗

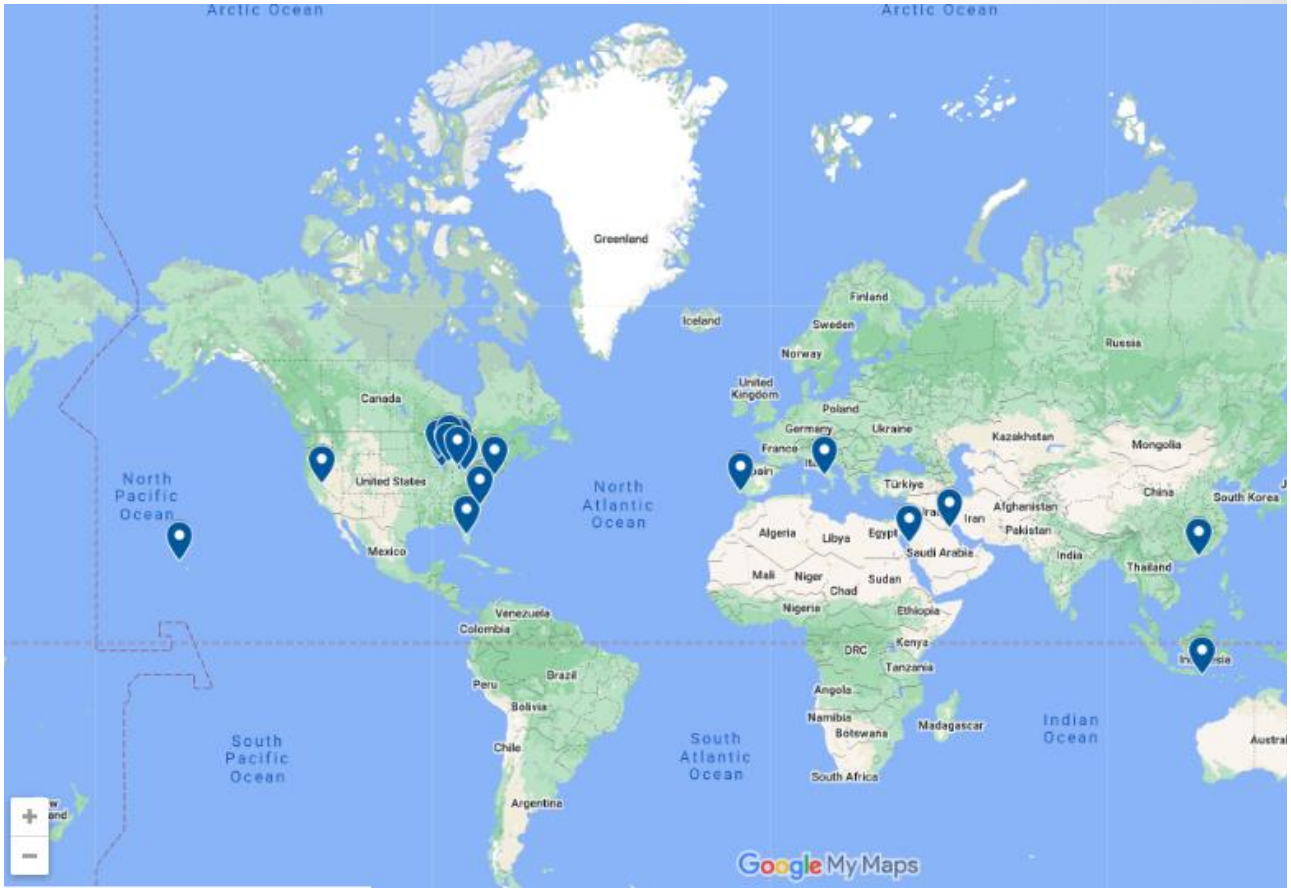


The Opportunity
BeBot – The Eco-Conscious Beach Cleaning Robot

- Capable of collecting waste down to ≈1.0cm^2
- Electric supplemented by solar. No Greenhouse Emissions
- No Noise Pollution
- Smaller overall dimensions > Increased accessibility to previously inaccessible beaches and tight spaces
- Significantly lighter than the tractor + rake combination > Less sand compaction and ecological impact. Minimises contribution to coastal erosion and vegetation damage
- Far more nimble> Easier to navigate beach wrack (Seaweed and organic matter) if desired, leaving it in place.
- Reduced maintenance burden and fuel cost.

The Testimonial – Current Deployment

- Currently approximately 20 units deployed globally.



- Bebot - Saudi Arabia
- BeBot Bali
- BeBot Hong Kong
- BeBot Napoli
- BeBot Wisconsin
- BeBot South Lake Tahoe
- BeBot Long Island
- BeBot Florida
- BeBot Ohio
- BeBot Oscoda - MI
- BeBot Illinois
- Bebot Oshkosh - WI
- Bebot Traverse City - MI
- Bebot Muskegon - MI
- Bebot Cleveland - MI
- Bebot Euclid - OH
- Bebot Wilmington - NC
- Bebot Lanai - HI
- Bebot Kuwait
- Bebot Brighton - MI
- Bebot Portugal

The Testimonial – Successful Implementation

Click Image for Link

The Testimonial – Successful Implementation

A Test Case

July 4th is Tahoe's biggest beach holiday. Since 2013, the League has organized simultaneous cleanup events at popular beaches around the lake on July 5th, known as Keep Tahoe Red, White and Blue.

During the League's 2022 edition of the Keep Tahoe Red, White and Blue Beach Cleanup, volunteers removed a staggering 3,450 pounds of trash from five beaches around Lake Tahoe. At one site, Nevada Beach, the BEBOT was deployed after volunteers picked up trash as a way to test the robot's beach-cleaning effectiveness.

A group of participants were asked to collect as much litter as they could find within a designated stretch of beach. They returned with 30 pieces of trash. Then the BEBOT covered the same area of beach – sifting through the top few inches of sand – and came back with 300 pieces of trash that were missed by the volunteers.

This simple test demonstrates that there is more litter in Tahoe than meets the eye, and both people and technology are part of the solution.

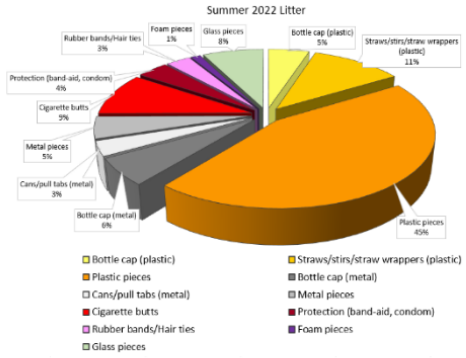
2022 Lake Tahoe BEBOT Cleanup Sites

As part of its pilot testing program, BEBOT was deployed along the north, east and south shores of Lake Tahoe this summer.

Beaches on the west shore were not addressed in 2022 due to the beaches being predominantly rocky substrate which hinders BEBOT operations and/or there was limited access. Additionally, a test site planned for sandy Meeks Bay was cancelled due to weather.

The BEBOT conducted cleanups from June to October at a mix of 11 public and private sites.

Total litter items collected: 4,497
Total area cleaned (square feet): 72,250



This pie chart shows key litter items. Plastic is a major concern due to its prevalence and incredibly slow speed of breakdown.

The Clean Coast Solution

CLEAN COAST SOLUTIONS
The Coastal Sustainability Company

- Work with councils/management bodies to provide them with a customized beach cleaning solution.
- Clean Coast Solutions owns and operates the beach cleaning service on behalf of councils.
- Data driven planning. BeBot enables data collection to facilitate optimisation and efficiency gains from subsequent cleans.
- Clean Coast Solutions will construct itself around an ethical lifecycle framework…not only in the eco-conscious planning and collection of waste, but ethically and responsibly dealing with the waste once it leaves our hands.

Clean Coast Solutions' Commitment to Ocean Plastic Education and Research

- Education programs in local schools and community organisations
- Engagement with council to collaborate on community marketing and promotional materials.
- Engagement with local academic institutions to encourage and facilitate research, not only in microplastics, but the impact of beach cleaning on the costal ecology (both positive and any negatives)

Clean Coast Solutions' Circular Economy Approach

- Committed to repurposing collected plastics in an ethical way.
- Injecting the plastics into the circular economy, rather then back into the pollution cycle.
- Pursing engagements with local companies who share a similar mission.

REPLAS
RECYCLED PLASTIC PRODUCTS

The Strategic Alignment

Our Economic Development and Tourism Strategy

MORNINGTON PENINSULA Shire

Circular Economy

Whilst the circular economy is not a stand-alone industry, it is **an operational concept that aims to remove waste from economic activities**. Activities related to circular economy include reducing material use, applying innovation to redesign products and services to be less resource intensive and re-capturing 'waste' as a valuable resource to manufacture new materials and products.

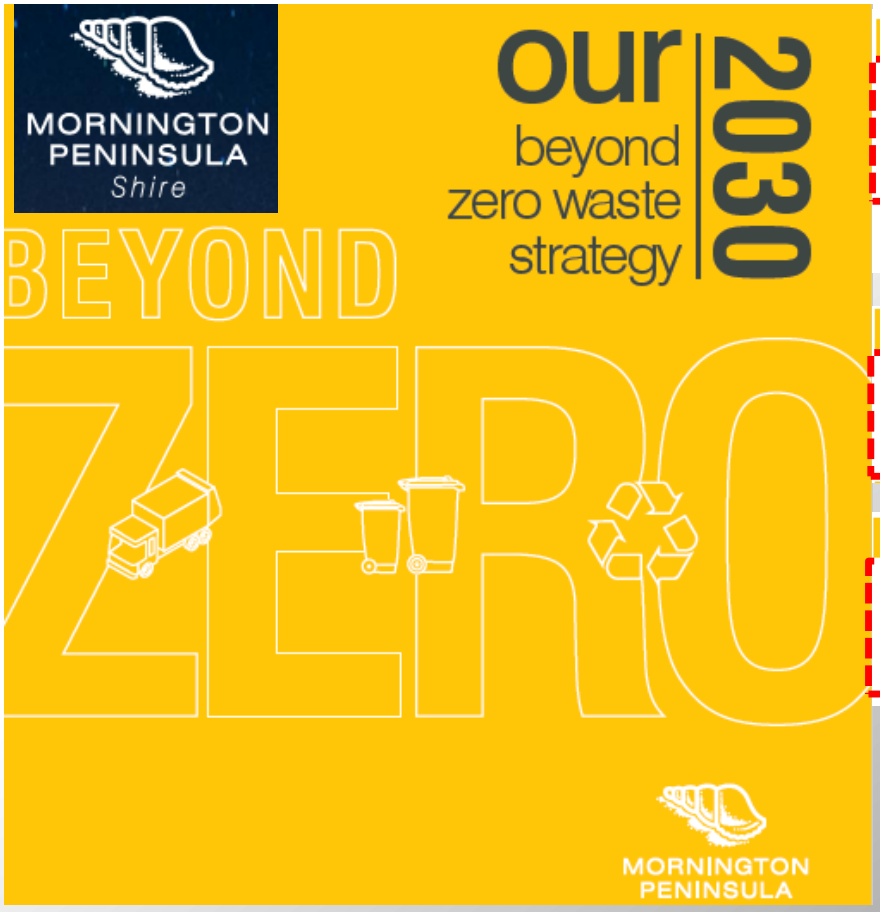
The ***Food Economy and Agroecology Strategy*** promotes circularity into all aspects of the Mornington Peninsula's food economy to encourage sustainable economic development. In addition to the benefits that a less resource-intensive approach to agriculture has for the Mornington Peninsula's agricultural sector, embracing and promoting circular economy principles will also serve to attract and retain 'green industries' that produce goods or services that contribute directly to **preserving and enhancing the quality of the natural environment**. This includes, for example, those businesses that **manufacture componentry for the renewable energy sector**, businesses engaged in the **design and production of energy-efficient materials** and those businesses that are engaged in **sustainable approaches to the management of waste**, where used products are re-purposed and returned to the economy in a new form or used more efficiently.

Moving towards a more circular economy delivers benefits to the Mornington Peninsula by reducing pressure on the natural environment, stimulating innovation, boosting economic activity and creating more local jobs for the Shire's resident workforce.

STRATEGY OUTCOMES

- Business and industry growth through business retention, expansion and support for innovation and investment in a diversity of industries.
- Opportunities for education, employment and career pathways which retain and support a growing and diverse population.
- A vibrant tourism economy that capitalises on and enhances the Mornington Peninsula's natural assets without compromising its highly valued and unique natural environment.
- A greener business environment that prioritises circular economy principles and works towards a zero carbon future.

The Strategic Alignment



Our Waste Goal 1 – An empowered community

1.1 Demonstrate leadership resource recovery.

1.2 Design targeted programs and explore partnerships with the community to reduce waste generation and promote reuse initiatives.

1.3 Phase out single-use plastics on the Peninsula

Our Waste Goal 4 – A clean and healthy Peninsula

4.1 Improve waste collection and resource recovery in public places

4.2 Deliver anti-litter behaviour change campaigns

4.3 Providing community engagement programs to encourage behaviour change regarding illegal dumping

4.4 Adopt proactive prevention model that demonstrates best practice in illegal dumping compliance and enforcement

Our Waste Goal 5 – Data driven decisions

5.1 Improve reporting on material that is reused, recycled and disposed to inform continual improvement

5.2 Provide regular report cards that update the community on Shire progress towards targets

Our Waste Goal 6 – An innovative and vocal Peninsula

6.1 Enabling and supporting strategic partnerships

6.2 Implement funding mechanisms to support local waste initiatives

6.3 Advocate on behalf of the community to State and Federal government members of parliament on matters of policy and funding

The Strategic Alignment

MORNINGTON PENINSULA Shire

Climate Change

Carbon Neutral

2. Best value actions

The Shire will implement **greenhouse gas emissions** reduction actions in accordance with a best value and best practice emissions management principles. Actions that provide a reasonable payback to the Shire or provide community benefit or increase community **resilience** will be prioritised.

For example, actions that should be considered a higher priority based on the best practice emissions management hierarchy are those that avoid emissions being generated in the first place. This may include the purchase of more efficient vehicles, integration of Ecological Sustainable Design principles in the building construction and waste avoidance measures.

5. Community and stakeholder engagement

The Shire commits to continuing a process of ongoing, purposeful, participatory, inclusive and accessible community engagement on **climate change** to support community **resilience**.

This Shire will encourage and support community led initiatives that aim to work towards **carbon neutrality** through shared learning.

6. Responsiveness and innovation

The Shire recognises that an effective response to **climate change** demands flexibility and a commitment to innovation. The Shire accepts this responsibility and is committed to being responsive and innovative, including by working in partnership with other groups and organisations to investigate new technologies and best practice approaches to emissions management.

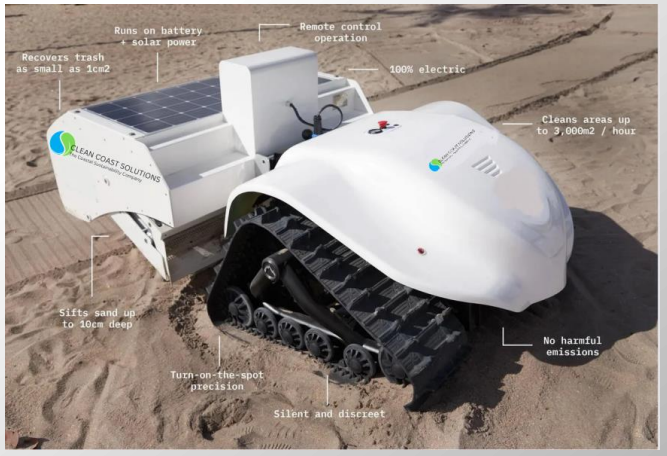

MORNINGTON PENINSULA Shire
CLEAN COAST SOLUTIONS
The Coastal Sustainability Company
A Partnership for a Cleaner Coastline

More on the Proposed Solution

Proposed Solution

The beach cleaning robot offers an extensive range of benefits over traditional beach cleaning methods:

Operation	Remote control up to 150 meters
Power	100% electric, batteries and solar pannels
Battery life	Up to 3 hours, full charge: 8 hours
Mobility	Top speed 2,7 km/h Can cope with obstacles of up to 20°. Pulls loads up to 400kg
Screening unit	Screening width: 130 cm Screening depth: 10 cm Cleaning capacity: 3,000 m² Can access any spot, even in tight spaces
Screening capacity	100 liters
Safety	Emergency stop button Safety LEDs for visibility Optional warning light and audible alert



VERSATILE

- Sifts sand
- Levels sand
- Rakes algae
- Lifts and tows loads
- Bracket for advertising

SECURE

- Signals its presence
- Operate on steep terrains

ECO FRIENDLY

- Safe for fauna, flora and sand acclaimed by the scientific community*
- 100% electric, solar panels, zero emissions

SILENT

- Quiet
- 24/7 operation

Benefits

Target waste for the beach cleaning robot is significantly smaller than the traditional method, capturing far more waste then previously capable.

- Capable of collecting waste down to ≈1.0cm^2

- Only capable of collecting waste down to ≈9cm^2

Benefits

- No Greenhouse Emissions/No Noise Pollution

- Battery powered for up to 6 hours, with swappable battery for extended hours of operation
- No noise emissions other than audible sifting mechanism

- An estimated 5.5 to 6.5 metric tons of carbon dioxide (CO_2) per year, based on an average annual usage of 200 to 250 hours for a 30HP tractor
- Noise levels estimated at 85 to 100 decibels (dB) when measured from a distance of about one meter. This is considered a loud noise level, and prolonged exposure to it can cause hearing damage or loss.

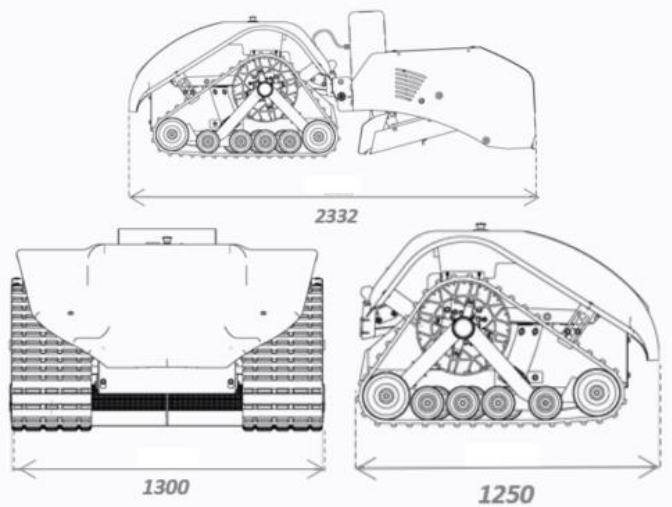
Benefits

- Automation – reducing the need on human operators reduces the cost of operation, making the service of beach cleaning more appealing to local governments.

- Remote Monitoring and Control– Opens up the market to remote beaches which have previously been too expensive to mechanically clean with heavy machinery and personnel.

Benefits

- Smaller overall dimensions > Increased accessibility to previously inaccessible beaches and tight spaces



- Opens the opportunity land the robot on previously inaccessible beaches potentially via stair sets or by utilising a barge

- The smallest surf rake on offer is H: 1,4 m x L: 3,0 m x W: 2,3 m.
- Add on to this the length of a tractor, and access to all beaches is difficult

Benefits

- Significantly lighter than the tractor + rake combination > Less sand compaction and ecological impact
- Track driven > Less impact on sand and vegetation

- Weighing 600kg
- Reduces impact on coastal erosion as a result of sand compaction and tire ruts.

- Rake alone weighs in the order of 900kg in addition to the tractor weight.

1. Wear of the sand granules
2. Variation of the morpho-topographic characteristics of the beach

- Predisposition for the removal of sand granules due to wind and / or storm surges

All this contributes to the phenomenon of coastal erosion

Benefits

- Far more nimble> Easier to navigate beach wrack (Seaweed and organic matter) if desired.

- Not all locations desire the removal of organic matter from beaches. The beach cleaning robot is more manoeuvrable and if desired, can leave vegetation and wrack undisturbed.

- If desired, the robot has a rake attachment for the relocation/removal of wrack

5 NOTICES OF MOTION

5.6 Notice of Motion 480 (Cr Allen) - Tennis and Bowls Club Leases

Cr Allen has given notice of her intention to move the following motion at the meeting.

Council resolves that

1. *Officers undertake additional engagement with representatives from relevant clubs and associations by May 2025, to gather feedback on outstanding issues and concerns regarding proposed tennis and bowls club leases.*

2. *Officers provide a report to Council following the engagement and relevant existing leases remain in overholding until then.*

Background

Council resolved at its Ordinary Meeting of 23 July 2024, to enter into new leasing agreements with a range of community tennis and bowls clubs operating on Council owned or managed land. Councillors were assured on multiple occasions at that meeting that the clubs had been consulted on these leases. The Clubs have reported not receiving any prior information from the Council as to any increase in rent payable, nor did Council or its representatives meet and/or discuss the general concerns held by the Clubs.

As outlined in a letter from Tennis Victoria - *clubs feel they have not been afforded input or discussion into the lease restructure process*.

Two of our State MPs also raised concerns with regards to these leases in November 2024.

The 18 tennis clubs requested that the Peninsula Tennis Association (PTA) represent them in discussions with Council on these concerns and Council received correspondence from lawyers representing the PTA which details the concerns with the leases.

On 22 November 2024 a meeting was held between the Clubs, PTA and Council officers to discuss these concerns. As a result of that meeting there was an expectation that the new leases would not be implemented, and officers would be coming back to a Council meeting early in 2025 with recommendations to address the concerns.

Since that November meeting there has been no communication with the PTA and a recent update from officers indicated that “Council remains committed to implementing the new lease agreements in fulfillment of the Council resolution.”

Issued By	Manager - Assets Property and Building Management
Authorised by	Director – Assets and Infrastructure

OFFICER COMMENT

Officers have liaised with Cr Allen on the wording of the proposed notice of motion. The motion allows for a formal pause to the implementation of the current Council resolution, while additional engagement and preparation of a report for Councillors consideration is undertaken.

Officers have committed resources to undertaking additional engagement with impacted tennis and bowls clubs and related stakeholders. It should be note that most bowls clubs have already signed up to the new lease agreements and so the focus of the additional engagement will primarily be with tennis clubs in the Shire.

Council officers have contacted the PTA to re-establish lines of communication.

By way of background, in 2022 the Property Operations team in collaboration with the Community Sport Development and Community Infrastructure and Open Space Planning teams engaged a consultancy firm, Sports Wise, to review tennis and bowling club lease agreements. The review process incorporated bench marking, consultative workshops with clubs, as well as recommendations and feedback from internal teams such as Building Maintenance, and Open Space Maintenance.

In June 2023 Council received the final report from the consultant inclusive of the club consultation and benchmarking with other Councils. A Council briefing was then held on 8 November 2023, where officers presented the recommendations based on their assessment and findings.

Legal Implications

All overdue leases will remain in overholding with the existing rights and obligations until the completion of the additional engagement and the provision of a report to Councillors.

The PTA has been asked by the eighteen impacted tennis clubs to represent their interests. The PTA has engaged legal advice to review the proposed Council leases.

Financial and Resourcing Implications

On the basis of the Council resolution on 23 July 2024, Council officers have projected 2025/26 budget income from tennis and bowls clubs' leases based on the revised rental charges proposed. These income figures may require revision following completion of the proposed actions in the NOM.

Potential Alternative Wording

Nil.

5.7 Notice of Motion 481 (Cr Gill) - Illegal Encroachment

Cr Gill has given notice of his intention to move the following motion at the meeting.

That:

1. *Council publicly lists all identified structure or other similar encroachments on Council owned property unless confidential legal action is underway*

2. *Councillors be immediately informed of any reasons why enforcement action has not been undertaken regarding each property known to have been encroached*

3. *Council investigate and report on encroachments on Council managed property*

4. *Councillors be immediately informed of any potential disposal of individual properties subject to encroachment.*

Background

There have been ongoing issues related to encroachment related to public land on the Mornington Peninsula.

As much as possible the public should be fully informed about any loss of public land.

There are a number of legal avenues to acquire public land with very few checks and balances to protect the public from loss of their land including 'backdating' dates of intention.

Issued By	Manager - Assets Property and Building Management
Authorised by	Director - Assets and Infrastructure

OFFICER COMMENT

Officers have developed a framework and approach to addressing encroachments on Council land. Council works in conjunction with Department of Energy, Environment and Climate Action (DEECA) when encroachments are detected on Crown Land. Council have funded a dedicated resource within the Property Strategy and Operations team to identify, investigate and address significant encroachments on public land where a financial settlement and transfer of land is deemed appropriate and feasible.

The current NOM wording requiring Councillors to be immediately informed of encroachment actions and potential land disposals is impracticable and unachievable. Encroachment issues are complex and require a range of investigations and external advice to determine the most appropriate resolution. Providing immediate notice of these actions to Councillors risks the advice being incomplete. Timeframes for encroachment resolution are also substantial i.e. 12-18 months and so immediate reactive reporting would be a less effective use of Council resources.

Officers suggest the preparation of an annual report to Council listing all identified encroachments on Council owned property, including progress towards resolution. This would be an appropriate way to address this NOM to ensure Councillors and the public are informed of the actions the Shire is taking to address identified encroachments.

Legal Implications

Where encroachments are identified on Council owned land any recommendation involving the sale of public land will be subject to the approval of Council by a formal resolution.

Exclusive use of public land (Crown Land) for a private activity is illegal under the *Crown Land Reserves Act 1978*, where encroachments are identified on Crown Land and Council is the appointed committee of management officers work with the Department of Climate, Energy, Environment and Climate Action (DEECA) to resolve.

Any identified encroachment that is subject to legal action is considered legally privileged and will not be made public.

Financial and Resourcing Implications

Nil

Potential Alternative Wording

That:

Officers prepare an annual report to Council listing all identified encroachments on Council owned property, including progress towards resolution. Such report to include:

1. Listing all identified structure or other similar encroachments on Council owned property unless confidential legal action is underway.

2. Informing Councillors of any reasons why enforcement action has not been undertaken regarding each property known to have been encroached.

3. Progress of investigations and resolution of encroachments on Council managed property.

4. Informing Councillors of any potential disposal of individual properties subject to encroachment.

5.8 Notice of Motion 483 (Cr Gill) - Cost Shifting

Cr Gill has given notice of his intention to move the following motion at the meeting.

That:

1. *All matters pertaining to cost shifting be referred to the 25/26 F/Budget with a determination to remove cost shifting items from the Council budget as referenced in NoM 439 16th April, 2024.*

2. *The setting up of a community watch dog budget panel suggested by Notice of Motion 434, December 11 2024 be brought to a public council meeting for decision on the 6th of May 2025 with a proposed budget to be decided between $0 and $9000.*

Background

Nil.

Issued By	Acting Chief Financial Officer
Authorised by	Chief Executive Officer

It is not recommended that all matters pertaining to cost shifting be referred to the 2025/2026 Financial Budget process with a determination to remove cost-shifting items, as outlined in Point 1 of the Notice of Motion.

Many of the affected services—such as libraries, foreshore management, and school crossings—are essential to the well-being of the community. Any decision to reduce or remove these services requires a thorough assessment of the community impact, which should be undertaken through a structured service review process rather than within the budget process.

A service review allows for a comprehensive evaluation of service effectiveness and community needs, ensuring informed decision-making that aligns with Council's strategic objectives. The timing and implementation of service reductions must be carefully considered, and addressing such matters solely through the budget process is not recommended.

With respect to Point 2, the establishment of a community budget watchdog panel is not recommended due to the significant Shire officer time required and the potential for costs exceeding $10,000.

Council already has comprehensive financial oversight mechanisms, including statutory financial reporting, the Audit and Risk Committee, and public consultation processes, all of which provide strong governance and transparency as outlined in the briefing report dated 10 December 2024.

The introduction of an additional panel may lead to duplication of efforts and inefficiencies, without providing additional value beyond existing oversight structures.

Given these considerations, it is recommended that Council does not support the Notice of Motion as proposed.

Legal Implications

N/A

Financial and Resourcing Implications

The financial and resource impact will need to be further assessed, depending on the scope and frequency of the proposed community budget watchdog panel.

Potential Alternative Wording

N/A