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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Austria

MARKET STUDY ON RUBBER AUTOMOTIVE COMPONENTS IN THE ASEAN REGION

April 1990

FINAL REPORT

DP/RAS/85/010

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Attention: Mr. S. Morozov
Chief, Contracts Section

Gentlemen:

Re: Contract No. 89/131 LM
Preparation of ASEAN Market Studies

We are pleased to submit our final report on Market Study on Rubber Automotive Components in the ASEAN Region. This is one of the four market studies commissioned by UNIDO to help the Committee on Industry, Minerals, and Energy (COIME) identify, prepare, and promote projects for the ASEAN Industrial Joint Ventures (AIJV) programme. The report compilation was coordinated by the International Team Leader of Project No. DP/RAF/85/010.

This market study covered the following ASEAN countries: Malaysia, Indonesia, the Philippines, Singapore, and Thailand. It aims to:

- identify the ASEAN market size for motor vehicles and for selected rubber automotive components with special emphasis on the Malaysian market;
- assess the status of development of the production facilities of these selected rubber automotive components in the ASEAN;
- identify possible sources of technical know-how outside the ASEAN; and
- identify potential export markets outside ASEAN.

The market data in the report consisted primarily of secondary information obtained from trade publications, industry associations, and government agencies and supplemented with key informant interviews with selected major rubber components manufacturers and automotive assemblers/producers in the countries covered. We were assisted in the data gathering by our offices in the ASEAN countries.

We will be glad to discuss any question you may have on this report.

Very truly yours,

SGV & Co.

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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Austria

MARKET STUDY ON RUBBER AUTOMOTIVE COMPONENTS IN THE ASEAN REGION

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1.1 THE MALAYSIAN MARKET

1.1.1 Industry Structure of the Automotive Industry

There are currently 13 automotive assembly/manufacturing plants in Malaysia which produce motorcycles, passenger cars, and commercial vehicles. Perusahaan Otomobil Nasional Sdn. Bhd. (Proton), a joint venture between Heavy Industries Corp. of Malaysia and Mitsubishi, is the producer of the made-in-Malaysia car called Proton Saga.

In terms of production volume, Proton is the largest among seven major producers of passenger cars in Malaysia, followed by Tan Chong Motor Assemblies Sdn. Bhd., maker of Nissan, Subaru, and Audi. Among the four major motorcycle producers, Boon Siew (Honda) and HLYM (Yamaha) are the biggest. On the other hand, among the seven major assemblers of commercial vehicles, Assembling Services Bhd. (Toyota, Daihatsu, Hino) ranked number one, followed by Tan Chong Motor Assemblies Sdn. Bhd. (Nissan, Subaru, Volkswagen).

Motor vehicle production grew at an average annual rate of 17 per cent from 178 thousand in 1986 to 281 thousand in 1989. Following is the breakdown of total motor vehicle production by type of vehicle from 1986 1989:

	Units			
Type of Vehicle	1986	1987	1988	1989 *
Motorcycles	115,960	104,055	120,012	169,970
Cars	44,624	34,138	60,663	80,740
Commercial vehicles	17,318	12,594	18,999	30,976
Total	177,902	150,787	199,674	281,686

* Annualized based on January to June 1989 actual figures.

Source: Statistics Department Annual Report 1989, Malaysia.

Production of motorcycles exceeded that of cars and commercial vehicles during the period 1986 to 1989. However, cars registered the highest average annual growth in production of 22 per cent during the period while motorcycle production increased by 14 per cent.

Total motor vehicle population in Malaysia based on the number of registered vehicles grew at an average rate of 4.5 per cent a year from 1986 to 1989. Following is the breakdown of total vehicle registrations by type of vehicle from 1986 to 1989:

	Units			
Type of Vehicle	1986	1987	1988	1989
Motorcycles	2,534,346	2,611,599	2,702,932	2,877,747
Cars	1,453,561	1,504,255	1,578,886	1,672,784
Buses	21,367	22,134	23,346	23,346
Goods vehicles	308,720	316,846	328,594	365,742
Other vehicles	142,634	144,528	149,158	149,158
Total	4,460,628	4,599,362	4,782,916	5,088,777

Source: Statistics Department Annual Report 1989, Malaysia.

Motorcycles outnumbered all other types of vehicles in Malaysia. In terms of average annual growth, however, goods vehicles ranked first with a growth rate of 5.8 per cent, followed by cars which registered an average increase of 4.8 per cent a year from 1986 to 1989.

1.1.2 Pertinent Regulations and Government Programs

Conceptualized as early as 1982, the National Car Project of Malaysia gave birth to Proton which began to manufacture the first Malaysian car in 1985. Called Proton Saga, the Malaysian car is targeted at the mass market. Proton's initial plant capacity is 80,000 units a year but, according to plans, this will be increased to 120,000 units a year. Proton

Saga's early success in the passenger car market is in part due to its very competitive price compared with the prices of foreign brands, made possible by the 40 per cent tariff duty exemption on Saga's imported CKD packs and the 50 per cent reduction in excise taxes.

Vehicles assembled in Malaysia were required to have at least 20 per cent local content as of 1988. The Malaysian government, however, plans to increase this to a minimum of 60 per cent. In 1988, motorcycles assembled in Malaysia attained 60 per cent local content, cars 30 per cent, and light commercial vehicles 20 per cent. Proton Saga, on the other hand, had 42 per cent local content as of mid-1986. This will be increased to 90 per cent by 1990.

Under the existing mandatory deletion program of the Malaysian government, mud flaps are included among the automotive components which should be locally sourced.

A government-endorsed program involves the Brand-to-Brand Complementation (BBC) Scheme. Under this sheme, certain components of a specific vehicle brand are traded and used by original equipment manufacturers (OEMs) in the participating ASEAN countries. As in the ASEAN Industrial Joint Venture (AIJV) scheme, the participating countries will provide preferential tariff privileges as well as local content accreditation for vehicle components imported from another country. The objective of this scheme is to allow economies of scale for each parts manufacturer which would be difficult to attain if limited to a single country market.

1.1.3 Historical Demand

There are two major market segments for rubber automotive components: the automotive manufacturing industry and the replacement market. The automotive manufacturing industry consists of 13 assemblers/producers of motor vehicles in the country while the replacement market consists of existing vehicle owners who purchase rubber automotive components from retailers to replace wornout or damaged parts.

The estimated demand for rubber automotive components by the automotive manufacturing industry alone in Malaysia from 1986 to 1989 is shown below:

Rubber Automotive Component	Pieces			
	1986	1987	1988	1989 *
Load bearing mountings	371,652	280,392	477,972	670,296
Weatherstrips	550,148	416,944	720,624	993,256
Windshield wiper blades	123,884	93,464	159,324	223,432
Car mats	178,496	136,552	242,652	322,960
Mud flaps	479,688	395,038	558,672	786,804
Bumper stops	247,768	186,928	318,648	446,864
Grommets	1,136,684	955,098	1,274,040	1,814,020
Pedal pads	417,746	348,306	479,010	675,088
Rubber seals	1,169,850	946,510	1,371,663	1,951,920

* Based on annualized motor vehicle production.

Sources of basic data: Statistics Department Annual Report 1989, Malaysia
Interviews.

In terms of number of pieces, rubber seals followed by grommets and weatherstrips registered the highest demand. The estimated demand was derived by multiplying the volume of vehicle production by the average number of rubber automotive components per vehicle.

Total demand by both the automotive manufacturing industry and the replacement market in Malaysia in 1989 is shown below with a breakdown by market segment.

Rubber Automotive Component	Pieces		
	Automotive Manufacturing	Replacement Market	Total
Load bearing mountings	670,296	90,949	761,245
Weatherstrips	993,256	317,636	1,310,892
Windshield wiper blades	223,432	435,576	659,008
Car mats	322,960	273,640	596,600
Mud flaps	786,804	5,421	792,225
Bumper stops	446,864	*	446,864
Grommets	1,814,020	56,169	1,870,189
Pedal pads	675,088	730,901	1,405,989
Rubber seals	1,951,920	138,512	2,090,432

* Minimal.

Source of basic data: Statistics Department Annual Report 1989, Malaysia
Interviews.

To estimate the 1989 replacement demand, the replacement rate of each rubber automotive component was placed either at the fifth or tenth year of the vehicle based on interviews. With these assumptions, the percentage of registered vehicles expected to remain on the road after five and after ten years was also estimated based on interviews. This was then applied to the volume of new registrations in 1984 and 1979 to get the approximate number of five- and ten-year old vehicles, respectively, as of 1989. Out of these five- and ten-year old vehicles, only a certain percentage was assumed to replace rubber components. The expected number of rubber components that would need replacement was also assumed based from interviews with vehicle repair shops.

The estimated replacement demand for car mats represents total demand inclusive of the portion that is accounted for by plastic car mats since there is no data on the extent of substitution between rubber and plastic mats in the replacement market.

The 1989 demand by the automotive industry was larger than replacement demand for all types of rubber components except windshield wiper blades and pedal pads. These two components are replaced every five years while other types are replaced only every ten years. Among the components replaced every ten years, those that have a large demand are weatherstrips, followed by car mats and rubber seals.

1.1.4 Projected Demand

The combined projected demand for rubber automotive components by the automotive manufacturing industry and the replacement market in Malaysia for years 1990, 1995, and 2000 is shown in the succeeding table.

Projected demand for rubber automotive components by the Malaysian automotive manufacturing industry was estimated using average historical growth of Malaysia's real gross domestic product (GDP) from 1978 to 1987, that is, five per cent. On the other hand, projected replacement demand was derived using the same assumptions and method employed in estimating the 1989 replacement demand. New registrations from 1980 to 1989, however, were used. New registrations of motor vehicles after 1989 were derived using projected motor vehicle production and importations. Projected vehicle importations were assumed to follow the average ratio of imports to total vehicle production from 1986 to 1988.

Rubber Automotive Component	1990			1995			2000		
	Automotive Manufacturing	Replacement Market	Total	Automotive Manufacturing	Replacement Market	Total	Automotive Manufacturing	Replacement Market	Total
Load bearing mountings	703,811	129,791	833,602	898,261	126,088	1,024,349	1,146,434	125,107	1,271,541
Weatherstrips	1,042,919	453,289	1,496,208	1,331,058	436,483	1,767,541	1,698,805	428,783	2,127,588
Windshield wiper blades	234,604	445,275	679,879	299,420	438,296	737,716	382,145	603,726	985,871
Car mats	339,108	390,504	729,612	432,797	375,406	808,203	552,371	369,371	921,742
Mud flaps	826,144	7,736	833,880	1,054,393	8,311	1,062,704	1,345,702	9,260	1,354,962
Bumper stops	469,207	*	469,207	598,840	*	598,840	764,289	*	764,289
Grommets	1,904,721	80,157	1,984,878	2,430,960	78,082	2,509,042	3,102,590	81,438	3,184,028
Pedal pads	708,842	759,266	1,468,108	904,682	759,871	1,664,553	1,154,630	1,067,695	2,222,325
Rubber seals	2,049,516	197,666	2,247,182	2,615,759	192,841	2,808,600	3,338,446	199,188	3,537,634

* Minimal.

Note: Projected replacement demand for car mats includes plastic mats which could not be estimated separately due to lack of data on extent of substitution.

Source of basic data: Statistics Department Annual Report 1989, Malaysia
Interviews.

1.1.5 Sources of Supply

In general, rubber automotive components are sourced from both local and foreign suppliers by either the automotive assemblers or the replacement market in Malaysia. Weatherstrips and wiper blades, in particular, are mainly imported. Wiper blades are usually imported as part of the windscreen wiper unit.

For automotive assembly, most of the rubber components are largely imported except for car mats and mud flaps. Although load bearing mountings, bumper stops, grommets, and pedal pads and seals are locally produced, these items are primarily sold to the replacement market and also partly to Proton. Proton uses locally produced car mats, mud flaps, bumper stops, grommets, pedal pads and seals, and windshield wiper blades. Around 80 per cent of the load bearing mountings used by Proton are imported. Its weatherstrips are entirely sourced from abroad.

Malaysian imports of windscreen wiper, defrosters, and demisters totaled about 1.21 million units or CIF US$1.7 million in 1988. Import volume grew slightly in 1989 to 1.26 million units but value declined to CIF US$1.5 million. Imports of bumpers and parts thereof reached 95 thousand pieces (CIF US$817 thousand) in 1988 but declined to 45 thousand pieces (CIF US$388 thousand) in 1989. Imports of weatherstrips and other types of rubber components are not available.

1.1.6 Profile of Major Producers

At present, there are 10 major producers of rubber automotive components in Malaysia. Four of these producers supply the automotive assemblers exclusively while one producer caters to the replacement market only. Seven produce car mats while three manufacture mud flaps. Only one manufactures load bearing mountings.

Due to the lack of adequate information on production capacity and volume, it is difficult to determine which manufacturer is the largest. In terms of range of products, Malaysian Auto Products Sdn. Bhd. has the widest range which includes load bearing mountings, bumper stops, grommets, and pedal pads and seals. However,

among the manufacturers of car mats, the largest is Len Brothers Rubber Product Industries Sdn. Bhd. with an annual production capacity of 1.7 million pieces, followed by Plaat Malaysia Sdn. Bhd. with an annual capacity of one million pieces. Wesma Rubber Products produces grommets solely for Proton while Kumpulan Jebco (M) Sdn. Bhd. supplies bumper stops exclusively to Proton. Malaysian Auto Products Sdn. Bhd. also produces these items but supplies only the replacement market.

1.1.7 Level of Technology

Both conventional and advanced manufacturing processes are employed by existing local manufaturers of rubber automotive components in Malaysia. Small- and medium-size locally owned enterprises still employ conventional processes without proper quality control facilities. On the other hand, large firms either wholly owned by foreign multinationals or jointly owned by foreign and local partners employ modern technology. This enables them to produce high quality products for both the domestic and export markets.

Among the manufacturers which claimed to use advanced technology are Malaysia Auto Products Sdn. Bhd., Chep Huat Rubber Works Co. Sdn. Bhd., and Tan Chong and Sons Motor Co. Sdn. Bhd. On the other hand, Fung Keong Rubber Manufactory (M) Sdn. Bhd. indicated that it uses low quality equipment. The other manufacturers did not indicate the level of technology used in their plants.

1.1.8 Technical Tie-ups

Len Brothers Rubber Products Industries Sdn. Bhd. has tie-ups with its major buyers like Nissan Japan and Ansell International. Plaat Malaysia Sdn. Bhd. also has tie-ups with its major buyers in the U.S. and Australia. It is 42 per cent owned by a foreign tie-up.

Tan Chong obtained a technical licensing agreement in 1988 to supply rubber mats to Kinugawa Rubber Industrial Co. Ltd., which is 30 per cent owned by Nissan Motor Co. Ltd. and one of Japan's largest OEM suppliers.

1.1.9 Distribution and Trade Practices

In Malaysia, rubber automotive components are sold either through distributors to retailers and the replacement market or directly to retailers through the manufacturer's own marketing arm. On the other hand, original equipment manufacturers buy directly from the rubber components manufacturers.

Imported rubber automotive products also pass through distributors before reaching retailers and the replacement market and the automotive assemblers.

Rubber automotive products are sold either on cash or on credit basis. Cash sales are often entitled to discounts. Credit terms popularly granted are 30, 50, 60, and 90 days.

The retail prices and original equipment (OE) prices of selected rubber automotive components for the Proton brand sold in Malaysia are as follows:

Component	Retail Price (US$ per pc)	OE Prices (US$ per pc)
Load bearing mountings	111.25	29.65
Weatherstrips *	89.00	27.80
Windshield/ wiper blades	0.75	0.25
Car mats *	11.85	5.55
Mud flaps *	5.95	3.90
Grommets and rubber seals	2.35	2.30

* Per car set.

Source: Interviews.

The retail prices are much higher than the OE prices, except for grommets and rubber seals. Retail prices are 1.5 to nearly four times the OE price levels. The retail prices of original Toyota rubber parts are even much higher than those shown above due to high Japanese quality

standards and sometimes to high import duties and freight costs.

1.1.10 Raw Materials

In Malaysia, rubber automotive components manufacturers generally use a larger proportion of natural rubber than synthetic rubber in their products because of the abundance of this raw material in the country. Natural rubber is available at advantageous prices while synthetic rubber, particularly EPDM, has to be imported with high import duties imposed on this item. Export-oriented manufacturers can also avail of discounts from authorized government agencies for natural rubber used in the manufacture of rubber components for export.

The proportion of natural rubber used generally by most of the rubber parts producers ranges from 75 to 100 per cent. Tan Chong, however, uses 40 per cent natural and 60 per cent synthetic rubber in its car mats. Wesma Rubber Products, on the other hand, uses 100 per cent synthetic rubber for grommets.

1.2 EXPORT OPPORTUNITIES

1.2.1 1989 Demand

Except for Singapore, the other ASEAN countries, namely Indonesia, the Philippines, and Thailand, have a local automotive manufacturing industry although primarily engaged only in the assembly of foreign brands of vehicles. In Singapore, trucks and buses are locally assembled but production data are not available. Thus, for the three countries mentioned, the market for rubber automotive components consists of two major segments as in Malaysia: the automotive manufacturing industry and the replacement market. For Singapore, the market consists mainly of replacement demand for rubber components.

Following is the estimated 1989 total demand for rubber automotive components by country market, market segment, and type of rubber automotive component:

Rubber Automotive Component	Country	Pieces		
		Automotive Manufacturing Industry	Replacement Market	Total
Load bearing mountings	Indonesia	2,398,788	116,103	2,514,891
	Philippines	175,680	82,724	258,404
	Singapore	-	27,094	27,094
	Thailand	1,102,656	216,973	1,319,629
	Total	3,677,124	442,894	4,120,018
Weatherstrips	Indonesia	2,296,968	290,523	2,587,491
	Philippines	268,582	240,870	509,452
	Singapore	-	87,198	87,198
	Thailand	1,284,158	361,572	1,645,730
	Total	3,849,708	980,163	4,829,871
Windshield wiper blades	Indonesia	799,596	524,416	1,324,012
	Philippines	58,560	211,573	270,133
	Singapore	-	104,318	104,318
	Thailand	367,552	911,172	1,278,724
	Total	1,225,708	1,751,479	2,977,187
Car mats	Indonesia	-	-	-
	Philippines	98,824	191,509	290,333
	Singapore	-	73,846	73,846
	Thailand	239,864	27,664	267,528
	Total	338,688	293,019	631,707
Mud flaps	Indonesia	1,599,192	23,031	1,622,223
	Philippines	161,565	13,973	175,538
	Singapore	-	3,133	3,133
	Thailand	735,104	72,324	807,428
	Total	2,495,861	112,461	2,608,322
Bumper stops	Indonesia	1,599,192	*	1,599,192
	Philippines	117,120	*	117,120
	Singapore	-	*	*
	Thailand	735,104	*	735,104
	Total	2,451,416	*	2,451,416

Rubber Automotive Component	Country	Pieces		
		Automotive Manufacturing Industry	Replacement Market	Total
Grommets	Indonesia	4,235,616	121,368	4,356,984
	Philippines	457,810	41,376	499,186
	Singapore	-	9,997	9,997
	Thailand	1,695,166	90,405	1,785,571
	Total	6,388,592	263,146	6,651,738
Pedal pads	Indonesia	1,199,394	1,214,259	2,413,653
	Philippines	172,676	280,635	453,311
	Singapore	-	122,455	122,455
	Thailand	551,328	911,172	1,462,500
	Total	1,923,398	2,528,521	4,451,919
Rubber seals	Indonesia	5,869,590	317,823	6,187,413
	Philippines	484,322	114,731	599,053
	Singapore	-	28,574	28,574
	Thailand	2,456,810	371,404	2,828,214
	Total	8,810,722	832,532	9,643,254

* Minimal.

In Indonesia, plastic instead of rubber car mats are used.

1.2.2 Demand Projections

Projected demand for rubber automotive components by the automotive manufacturing industry of Indonesia, the Philippines, and Thailand was estimated based on projected volume of automotive production. The projected growth of automotive production was assumed to follow the average historical growth of these countries' GDP. On the other hand, as in the Malaysian market, projected replacement demand in the four ASEAN countries was derived by determining the percentage of five- and ten-year old vehicles which are expected to replace rubber components, and applying the percentage to new vehicle registrations. Out of the estimated five- and ten-year old vehicles, a certain proportion was assumed to replace rubber components. The estimated number of rubber automotive components that would need replacement was also assumed based on interviews.

Using this approach, total projected demand for rubber automotive components in the four ASEAN countries for years 1990, 1995, and 2000 is shown below.

Rubber Automotive Component	Country	1990 Automotive Manufacturing Industry	1990 Replacement Market	1990 Total	1995 Automotive Manufacturing Industry	1995 Replacement Market	1995 Total	2000 Automotive Manufacturing Industry	2000 Replacement Market	2000 Total
Load bearing mountings	Indonesia	2,494,740	158,272	2,653,012	3,035,232	156,839	3,192,071	3,692,824	113,499	3,806,323
	Philippines	182,707	98,385	281,092	222,291	62,329	284,620	270,451	105,484	375,935
	Singapore	-	39,598	39,598	-	19,913	19,913	-	35,196	35,196
	Thailand	1,157,789	235,586	1,393,375	1,477,664	315,886	1,793,550	1,885,916	1,087,241	2,973,157
	Total	3,835,236	531,841	4,367,077	4,735,187	554,967	5,290,154	5,849,191	1,341,420	7,190,611
Weatherstrips	Indonesia	2,388,847	385,225	2,774,072	2,906,397	395,546	3,301,943	3,536,077	344,488	3,880,565
	Philippines	279,325	277,748	557,073	339,842	186,959	526,801	413,470	344,729	758,199
	Singapore	-	135,553	135,553	-	66,371	66,371	-	123,286	123,286
	Thailand	1,348,366	392,589	1,740,955	1,720,895	526,404	2,247,299	2,196,346	1,811,819	4,008,165
	Total	4,016,538	1,191,115	5,207,653	4,967,134	1,175,280	6,142,414	6,145,893	2,624,322	8,770,215
Windshield wiper blades	Indonesia	831,580	571,315	1,402,895	1,011,744	483,946	1,495,690	1,230,941	411,711	1,642,652
	Philippines	60,902	163,974	224,876	74,097	103,882	177,979	90,150	175,807	265,957
	Singapore	-	102,532	102,532	-	96,830	96,830	-	125,548	125,548
	Thailand	385,930	977,617	1,363,547	492,555	985,733	1,478,288	628,639	1,812,069	2,440,708
	Total	1,278,412	1,815,438	3,093,850	1,578,396	1,670,391	3,248,787	1,949,730	2,525,135	4,474,865
Car mats	Indonesia	-	-	-	-	-	-	-	-	-
	Philippines	102,777	215,685	318,462	125,044	149,260	274,304	152,135	287,152	439,287
	Singapore	-	116,551	116,551	-	56,208	56,208	-	106,214	106,214
	Thailand	251,857	30,037	281,894	321,441	40,275	361,716	410,249	138,623	548,872
	Total	354,634	362,273	716,907	446,485	245,743	692,228	562,384	531,989	1,094,373

Rubber Automotive Component	Country	1990			1995			2000		
		Automotive Manufacturing Industry	Replacement Market	Total	Automotive Manufacturing Industry	Replacement Market	Total	Automotive Manufacturing Industry	Replacement Market	Total
Mud flaps	Indonesia	1,663,160	33,062	1,696,222	2,023,488	30,636	2,054,124	2,461,883	13,210	2,475,093
	Philippines	168,028	18,095	186,123	204,431	9,341	213,772	248,722	10,548	259,270
	Singapore	-	2,937	2,937	-	1,793	1,793	-	2,017	2,017
	Thailand	771,859	78,529	850,388	985,110	105,295	1,090,405	1,257,277	362,414	1,619,691
	Total	2,603,047	132,623	2,735,670	3,213,029	147,065	3,360,094	3,967,882	388,189	4,356,071
Bumper stops	Indonesia	1,663,160	*	1,663,160	2,023,488	*	2,023,488	2,461,883	*	2,461,883
	Philippines	121,805	*	121,805	148,194	*	148,194	180,301	*	180,301
	Singapore	-	*	*	-	*	*	-	*	*
	Thailand	771,859	*	771,859	985,110	*	985,110	1,257,277	*	1,257,277
	Total	2,556,824	*	2,556,824	3,156,792	*	3,156,792	3,899,461	*	3,899,461
Grommets	Indonesia	4,405,041	149,113	4,554,154	5,359,405	115,326	5,474,731	6,520,536	191,096	6,711,632
	Philippines	476,122	51,260	527,382	579,276	40,725	620,001	704,777	78,527	783,304
	Singapore	-	13,739	13,739	-	7,876	7,876	-	11,365	11,365
	Thailand	1,779,924	98,161	1,878,085	2,271,685	131,619	2,403,304	2,899,309	453,017	3,352,326
	Total	6,661,087	312,273	6,973,360	8,210,366	295,546	8,505,912	10,124,622	734,005	10,858,627

Rubber Automotive Component	Country	1990			1995			2000		
		Automotive Manufacturing Industry	Replacement Market	Total	Automotive Manufacturing Industry	Replacement Market	Total	Automotive Manufacturing Industry	Replacement Market	Total
Pedal pads	Indonesia	1,247,370	1,119,786	2,367,156	1,517,616	1,298,825	2,816,441	1,846,412	1,544,320	3,390,732
	Philippines	179,583	222,697	402,280	218,490	172,122	390,612	265,827	332,081	597,908
	Singapore	-	118,366	118,366	-	109,666	109,666	-	137,218	137,218
	Thailand	578,894	977,617	1,556,511	738,832	985,733	1,724,565	942,958	1,812,069	2,755,027
	Total	2,005,847	2,438,466	4,444,313	2,474,938	2,566,346	5,041,284	3,055,197	3,825,688	6,880,885
Rubber seals	Indonesia	6,104,374	403,914	6,508,288	7,426,904	331,134	7,758,038	9,035,964	436,985	9,472,949
	Philippines	503,695	142,701	646,396	612,822	105,242	718,064	745,591	192,216	937,807
	Singapore	-	39,061	39,061	-	21,988	21,988	-	32,843	32,843
	Thailand	2,579,651	403,264	2,982,915	3,292,360	540,718	3,833,078	4,201,979	1,861,085	6,063,064
	Total	9,187,720	988,940	10,176,660	11,332,086	999,082	12,331,168	13,983,534	2,523,129	16,506,663

Note: Projected replacement demand for car mats includes plastic mats which could not be estimated separately for the Philippines, Singapore, and Thailand due to lack of data on extent of substitution.

1.2.3 Sources of Supply

Among the four countries, only Singapore does not have a single producer of rubber automotive components, partly because it does not have an automotive manufacturing industry to support. Rubber automotive components for replacement are sourced by Singapore from Japan, France, and Italy.

In Indonesia, weatherstrips, mud flaps, bumper stops, grommets, and pedal pads and seals used in either motorcycles or utility vehicles are obtained from local producers. On the other hand, load bearing mountings and windshield wiper blades are usually imported.

The majority of rubber automotive components are sourced locally in the Philippines. The only items that are mainly imported are load bearing mountings, windshield wiper blades, and bumper stops. However, some automotive assemblers also import mud flaps, weatherstrips, grommets, and rubber seals from Japan. Aside from Japan, other major suppliers of the Philippines are South Korea, the People's Republic of China, and the U.S.

The demand for rubber automotive components in Thailand is mainly satisfied by local producers. About 85 to 90 per cent of the items used in automotive assembly are sourced locally while the remaining 10 to 15 per cent are imported. However, it was not specified which rubber components are sourced from foreign suppliers abroad.

1.2.4 Major Local Producers

The major OEM supplier of rubber automotive components in Indonesia is Inoue Rubber Corporation. It produces almost all of the rubber automotive components except load bearing mountings and windshield wiper blades. Its output goes entirely to the automotive manufacturing industry, specifically the Astra and Indo Mobil groups, and other assemblers who carry Japanese brands except Mitsubishi. Indonesia has smaller local manufacturers of rubber automotive components which cater to the replacement market. The latter is usually less discriminating than the OEMs in terms of product standards.

There are about seven major manufacturers of rubber automotive components in the Philippines. The major OEM suppliers are Magna Rubber Manufacturing Corp., which produces car mats, mud flaps, bumper stops, grommets, and pedal pads and seals; Cavalier Marketing & Rubber Manufacturing, which supplies weatherstrips, windshield wiper blades, mud flaps, bumper stops, grommets, and pedal pads and seals; and Crislin Rubber Products, which manufactures load bearing mountings, car mats, mud flaps, bumper stops, grommets, and pedal pads and seals. Transworld Rubber Industrial Corp., which supplies both assemblers and the replacement market, produces car mats and weatherstrips.

Thailand also has seven major producers of rubber automotive components. Hui Hai Industry Co., Ltd. manufactures only car mats. International Rubber Parts Co., Ltd. makes car mats, mud flaps, and load bearing mountings. World Rubber Co., Ltd. and Pongpara Codan Rubber Co., Ltd. both manufacture window and door weatherstrips. The other producers did not specify what types of rubber components they manufacture.

1.2.5 Level of Technology

Inoue Rubber Corporation in Indonesia uses advanced technology compared with the smaller local manufacturers. In the Philippines, the manufacturers generally still use conventional manufacturing processes. In Thailand, however, there was no indication of how advanced is the level of technology used by local manufacturers.

1.2.6 Raw Materials

Both natural and synthetic rubber are used in the manufacture of rubber automotive components in the countries mentioned. In the Philippines, three out of the seven manufacturers use 100 per cent natural rubber in their products. The others use either 40 or 50 per cent synthetic rubber. In Thailand, natural rubber is used in producing almost all components because of its abundance in that country. However, synthetic rubber is used in the production of load bearing mountings and bumper stops for greater durability.

1.3 MARKET ASSESSMENT

Among the five ASEAN countries covered, the country which has the highest total demand for rubber automotive components in 1989 was Indonesia, followed closely by Thailand. Malaysia ranked only third as shown below.

	Pieces		
Country	Automotive Manufacturing Industry	Replacement Market	Total
Indonesia	19,998,336	2,607,523	22,605,859
Malaysia	7,884,640	2,048,804	9,933,444
Philippines	1,995,139	1,177,391	3,172,530
Singapore	-	456,615	456,615
Thailand	9,167,742	2,962,686	12,130,428

Indonesia had the highest estimated demand for automotive assembly/production, followed by Thailand. On the other hand, replacement demand was highest for Thailand, followed closely by Indonesia.

In terms of total projected demand from 1990 to 2000, Indonesia and Thailand will continue to be the top users of rubber automotive components.

	Pieces				
Country	1990	1991	1992	1995	2000
Indonesia	23,618,958	25,052,652	26,465,989	28,116,526	33,841,829
Malaysia	10,742,555	10,960,921	11,484,663	12,981,548	16,369,978
Philippines	3,265,489	3,637,815	3,900,177	3,354,347	4,597,969
Singapore	568,328	454,001	593,787	380,645	573,687
Thailand	12,819,529	13,520,391	14,228,810	15,917,315	25,018,287

While the automotive manufacturing industry of the ASEAN countries represents the larger market compared with the replacement market, the major local manufacturers of rubber automotive products in most of these countries already have existing tie-ups with the OEMS. Or, the OEMs already have existing arrangements with their own foreign suppliers for the supply of rubber components either not available locally or are available but are of substandard quality. It is therefore foreseen that there will be difficulties in penetrating the OEM markets in the ASEAN countries.

On the other hand, the replacement market in these countries represent a smaller market. This is due to the fact that many of the rubber automotive components are usually replaced only after ten years and, for each type of component, only a certain number of pieces are usually replaced. The only components that are regularly replaced are windshield wiper blades and pedal pads (after five years) and car mats (after ten years).

Despite its smaller size compared with the OEM market, the replacement market in the ASEAN countries is believed to be a more viable option for the project. There is, however, a proliferation of poor quality rubber components in these markets. But, given the preferential tariff treatment, cheap raw materials, and economies of scale which the project will enjoy, the project may turn out to be price-competitive.

The project can also compete with the existing foreign suppliers particularly of items like load bearing mountings, wiper blades, bumper stops, and weatherstrips. These items are largely imported in some of the countries. The project will have the advantages of lower tariff rates as well as local content accreditation which are not available to ordinary foreign suppliers.

The project can establish a technical tie-up with one of the big Japanese manufacturers of rubber automotive components. Some of the candidates are Toyoda Gosei Co., which is affiliated with Toyota, Inoue MTP Co., Ltd., which is already in Indonesia and Thailand, Tokai Rubber Industries, and Kurashiki Kako Co. Aside from the benefit of acquiring technical know-how, a joint venture or technical licensing agreement might be a way to cut into the Japanese market on a long-term basis. In any case, the acquisition of the latest technology should provide the project with a competitive edge over most local producers in the ASEAN which still employ conventional manufacturing processes and do not have access to advanced technology.

2. INTRODUCTION

2.1 BACKGROUND AND OBJECTIVES OF THE STUDY

The United Nations Industrial Development Organization (UNIDO) has engaged the services of SyCip, Gorres, Velayo, and Co. (SGV) to conduct this ASEAN regional market study on rubber automotive components. This is one of several studies commissioned by the UNIDO in coordination with the Committee on Industry, Minerals, and Energy (COIME) to assess the market potential of possible projects to be promoted as ASEAN Industrial Joint Ventures (AIJVs). Rubber automotive components was one of the investment areas identified by Malaysia.

The AIJV scheme seeks to pool resources through joint ventures between at least two ASEAN countries, at the same time expanding markets across the region by granting preferential market access. Specifically, the participating ASEAN countries under the AIJV scheme will provide preferential tariff treatment or percentage discount on prevailing tariff rates. The project's products will also be given local content accreditation if necessary.

The report compilation was coordinated by the International Team Leader of Project No. DP/RAF/85/010.

The ASEAN countries covered in this study include Malaysia (the country proponent and site for this project), Indonesia, the Philippines, Singapore, and Thailand.

The study has the following objectives:

- to assess the ASEAN market size for motor vehicles and for selected rubber automotive components with special emphasis on the Malaysian market;
- to assess the status of development of the production facilities of these selected rubber automotive components in the ASEAN;
- to identify possible sources of technical know-how outside the ASEAN; and
- to identify potential export markets outside ASEAN.

2.2 SCOPE AND METHODOLOGY

The study covered nine specific types of rubber automotive components, namely, load bearing mountings, weatherstrips, windshield wiper blades, car mats, mud flaps, bumper stops, grommets, pedal pads, and rubber seals. A description of each rubber component follows:

- o Load bearing mountings

  These include engine mountings, sub-frame mountings, and suspension mountings. These are high value items requiring a high level of technology. Except for motorcyles which do not use these items, each vehicle has an average of six load bearing mountings.

- o Weatherstrips

  These are thin strips of rubber meant to seal windows, doors, and trunk lids and keep dirt, water, air, and noise from entering inside the vehicle. They also serve as support and ease minute vibrations of the vehicle's body. Weatherstrips must be designed so that they facilitate assembly of the vehicle. On the average, cars have ten weatherstrips, Asian Utility Vehicles (AUVs) and Light Commercial Vehicles (LCVs) have six, and trucks and buses have three.

- o Windshield wiper blades

  These are small items, averaging about 35 grams per blade, which are attached to a windscreen wiper. Wipers are important accessories of a vehicle especially in rainy conditions. Except for motorcyles which do not use this item, each vehicle has an average of two windshield wiper blades.

- o Car mats

  These products are made of corrugated or perforated rubber so as to present a roughly ridged or furrowed surface. These are placed on the floor of the vehicle to keep dust and dirt from settling or water from seeping through the vehicle's carpet or floor. A car has an average of four mats and an AUV has an average of two.

- Mud flaps

  These are thin sheets of rubber parts of a vehicle suspended behind each rear wheel of a motor vehicle to prevent mud or water from spreading on the chassis and bottom side of the vehicle. Like car mats, they are relatively low value products. Cars, AUVs, LCVs, and trucks and buses have four mud flaps each. Motorcyles have two mud flaps.

- Bumper stops

  Also known as bumper bounds and bump stoppers, these are attached to the vehicle's shock absorbers. Their purpose is to cushion the vehicle against impact and to keep out dirt and dust from the shock absorbers. Cars, AUVs, LCVs, and trucks and buses each have four bumper stops.

- Grommets

  These are rings of rubber designed to line a hole to prevent a cable or pipe passed through it from chafing. Like most of the other rubber automotive components, these are low value products. On the average, motorcycles and cars each have six grommets, AUVs and LCVs have ten, and trucks and buses have 15.

- Pedal pads

  Pedal pads are used to cover the brake, gas, and clutch pedals of a vehicle to protect them against friction. Cars, AUVs, LCVs, and trucks and buses have three pedal pads while motorcycles have only two.

- Seals

  Seals are used to fasten or tighten doors, windows, gaskets, and oil filters. On the average, cars and AUVs have ten rubber seals, LCVs and trucks and buses have 15, and motorcycles have four.

Drawings of these rubber automotive components are presented in Annex A. Annex B shows the location of these parts in a typical car.

The market data presented in this report consist mainly of available secondary data obtained from trade publications, industry associations, and government agencies. To supplement secondary data, key informant interviews with selected major manufacturers of rubber automotive components and with selected major automotive assemblers/producers were conducted. In Malaysia, representatives from the Malaysian Industrial Development Authority (MIDA) and the Malaysian Rubber Research and Development Board (MRRDB) were also interviewed.

3. THE MALAYSIAN MARKET

3.1 BACKGROUND ON THE AUTOMOTIVE INDUSTRY

3.1.1 Industry Structure

The Malaysian automotive industry was originally involved only in distribution and dealership of motor vehicles. It was in 1967 when the first automotive assembly plants were established in Malaysia. Assemblers then imported the parts from abroad in the form of completely knocked down (CKD) packs. In 1985, the industry started to produce the first Malaysian car - the Proton Saga. In 1989, three other companies were given manufacturing licenses to locally assemble passenger cars and commercial vehicles. These were UMW Toyota Sdn. Bhd., Tan Chong Motor Holdings Bhd. (Nissan), and Oriental Holdings Bhd. (Honda).

To date, there are 13 assembly plants in Malaysia engaged in the assembly of motorcycles, passenger cars, and commercial vehicles. Except for Perusahaan Otomobil Nasional Sdn. Bhd. (Proton), these plants produce a wide range of foreign brands and models under manufacturing licenses from the United States, Japan, Europe, and Australia. (See Table 1.)

Table 1
AUTOMOTIVE ASSEMBLERS IN MALAYSIA

Assembler	Vehicle Brand
Motorcycles	
Boon Siew	Honda
HLYM	Yamaha
Kawasaki Sunrock	Kawasaki
SAM	Suzuki
Cars and Commercial Vehicles	
Asia Motor Industries Sdn. Bhd.	Mercedes, Ford, BMW, Landrover, Suzuki
Assembling Services Bhd.	Toyota, Daihatsu, Hino
Automotive Manufacturer (M) Industries Sdn. Bhd.	Isuzu, Citroen, Tata, Mitsubishi, Suzuki
Oriental Assembler Sdn. Bhd.	Honda, Mercedes, Peugeot
Swedish Motor Assemblies Sdn. Bhd.	Volvo
Tan Chong Motor Assemblies Sdn. Bhd.	Nissan, Subaru, Audi, Volkswagen
Cars Only	
Perusahaan Otomobil Nasional Sdn. Bhd. (Proton)	Proton
Commercial Vehicles Only	
Cycle and Carriage Bintang Sdn. Bhd.	Mercedes
Kinabalu Motor Industries Sdn. Bhd.	Isuzu, Pacific

Source: Malaysian Industrial Development Authority (MIDA).

In 1986, 16 brands with 90 models of passenger cars and 15 brands with 180 models of commercial vehicles were approved for production. However, market demand and consumer preferences limited the production of passenger cars to only 11 brands and 30 models in that year. Of the total cars produced, about 80 per

cent was accounted for by nine to ten models of six brands.

Cars sold in the Malaysian market in 1986 had engine capacity ranging from 800 cc. to 5,000 cc. with the most popular (65 per cent of the market) being 1,600 cc. and below. Malaysian cars were marketed by franchisees such as Tan Chong Motors, Sejati Motors, BMW Concessionaires, and others. (See Table 2.)

Table 2
MAJOR FRANCHISE HOLDERS OF CARS IN MALAYSIA

1. Anim Holdings for Ford
2. Auto Corporation of Malaysia for Isuzu and Fiat
3. Auto Dunia for Subaru and Audi
4. BMW Concessionaires for BMW
5. Cycle and Carriage Bintang for Mercedes Benz and Mitsubishi
6. Daihatsu (M) Sdn. Bhd. for Daihatsu
7. Federal Auto for Volvo
8. Kah Motors for Honda
9. Kobin Motors for Suzuki
10. Sejati Motors for Toyota
11. Tan Chong Motors for Nissan
12. Edaran Otomobil Nasional for Proton Saga

Source: Bank Bumiputra Malaysia Berhad (BBMB) Economic Review, March-April 1986.

3.1.2 Historical Production of Motor Vehicles

Total motor vehicle production which includes all makes and assemblers grew at a compounded annual rate of 17 per cent from 1986 to 1989. 1989 data, which were available only for the first semester, were annualized.

Table 3
MOTOR VEHICLE PRODUCTION IN MALAYSIA
BY TYPE OF VEHICLE
1986-1989
(in units)

Type of Vehicle	1986	1987	1988	1989 *
Motorcycles	115,960	104,055	120,612	169,970
Cars	44,624	34,138	60,663	80,740
Commercial vehicles	17,318	12,594	18,999	30,976
Total	177,902	150,787	199,674	281,686

* Annualized based on January to June 1989 actual figures.

Source: Statistics Department Annual Report 1989, Malaysia.

The succeeding tables show a breakdown of production of the different types of vehicles by major assembler and model. The data in these tables include vehicle production only of major assemblers.

As shown in Table 4, the four major assemblers of motorcycles in Malaysia all carry Japanese brands. During the period 1987 to 1989, assemblers of Honda and Yamaha motorcyles produced the largest number of units in the country. The two companies' combined production was approximately 83 per cent of total production in 1989.

Table 4
MOTORCYCLE PRODUCTION IN MALAYSIA BY MAJOR ASSEMBLER
1986-1989
(in units)

Assembler	Vehicle Brand	1986	1987	1988	1989 *
Boon Siew	Honda	32,323	28,345	37,850	51,280
HLYM	Yamaha	43,193	25,540	33,063	47,717 **
Kawasaki Sunrock	Kawasaki	976	-	671	2,960
SAM	Suzuki	33,377	23,770	27,720	17,310
	Total	109,869	77,655	99,304	119,267

* Annualized based on January to June 1989 actual figures.
** Annualized based on January to July 1989 actual figures.

Source: MIDA.

On the other hand, the number of passenger car assemblers decreased from ten in 1986 to seven in 1989. Kilang Pembena Kereta Sdn. Bhd. closed down in 1987, Sarawak Motor Industries Sdn. Bhd. in 1988, and Asia Automobile Ltd. in 1989. The three assemblers stopped operations due to the underutilization of their plants and the high production costs resulting from the high import content. Production of certain brands also shifted from one assembler to another in 1988. Oriental Assembler Sdn. Bhd. took over the production of the Peugeot brand from Asia Automobile Ltd. and the Mercedes brand from Asia Motor Industries Sdn. Bhd. Assembly of BMW also shifted from Sarawak Motor Industries Sdn. Bhd. to Asia Motor Industries Sdn. Bhd. (See Table 5.)

Table 5
CAR PRODUCTION IN MALAYSIA BY ASSEMBLER AND BRAND
1986-1989
(in units)

Assembler	Vehicle Brand	1986	1987	1988	1989 *
Asia Automobile Ltd.	Mazda	1,183	411	165	-
	Peugeot	122	64	-	-
Sub-total		1,305	475	165	-
Asia Motor Industries Sdn. Bhd.	Mercedes	169	392	-	-
	Ford	1,538	716	524	1,166
	BMW	-	50	165	660
Sub-total		1,707	1,158	689	1,826
Assembling Services Bhd.	Toyota	3,993	1,371	3,590	4,070
	Daihatsu	1,420	766	998	1,773
Sub-total		5,413	2,137	4,588	5,843
Automotive Manufacturer (M) Industries Sdn. Bhd.	Isuzu	280	96	1	2
	Citroen	8	-	-	-
Sub-total		288	96	1	2
Kilang Pembena Kereta Sdn. Bhd.	Mitsubishi	1	-	-	-
Oriental Assembler Sdn. Bhd.	Honda	2,531	1,557	3,473	5,638
	Mercedes	-	92	387	559
	Peugeot	-	109	411	519
Sub-total		2,531	1,758	4,271	6,716
Perusahaan Otomobil Nasional Sdn. Bhd.	Proton	24,931	24,182	44,732	46,761
Sarawak Motor Industries Sdn. Bhd.	BMW	163	8	-	-

Assembler	Vehicle Brand	1986	1987	1988	1989 *
Swedish Motor Assemblies Sdn. Bhd.	Volvo	330	392	1,260	1,802
Tan Chong Motor Assemblies Sdn. Bhd.	Nissan	5,327	3,429	5,579	9,394
	Subaru	19	57	41	15
	Audi	-	-	12	19
Sub-total		5,346	3,486	5,632	9,428
	Total	42,015	33,692	61,338	72,378

* Annualized based on January to July 1989 actual figures.

Source: MIDA.

The different car assemblers each carry from one to four vehicle brands. Of all brands produced, the Proton Saga accounted for the biggest share of car production at an average of 67 per cent of yearly total from 1986 to 1989.

Seven companies currently assemble commercial vehicles in Malaysia. Of these companies, the assemblers of Toyota, Nissan, and Ford commercial vehicles produced the largest number of units from 1986 to 1989. (See Table 6.)

Since 1986, three assemblers have closed down or suspended its operations. These assemblers were Sarawak Motor Industries Sdn. Bhd. and Swedish Motor Assemblies Sdn. Bhd. which stopped operations in 1988, and Asia Automobile Ltd. which closed down in 1989. Production of five brands of commercial vehicles also shifted from one assembler to another during the 1986 to 1989 period. From Sarawak Motor Industries Sdn. Bhd., the assembly of four brands was shifted to other companies, namely: the Mitsubishi brand to Automotive Manufacturer (M) Industries Sdn. Bhd. in 1987, the Hino and Toyota brands to Assembling Services in 1988, and the Pacific brand to Kinabalu Motor Industries Sdn. Bhd. also in 1988. The production of the Suzuki brand was transferred from Automotive Manufacturer (M) Industries Sdn. Bhd. to Asia Motor Industries Sdn. Bhd. in 1988.

Table 6
COMMERCIAL VEHICLE PRODUCTION IN MALAYSIA
BY ASSEMBLER AND BRAND
1986-1989
(in units)

Assembler	Vehicle Brand	1986	1987	1988	1989 *
Asia Automobile Ltd.	Mazda	787	450	136	-
Asia Motor Industries Sdn. Bhd.	Ford	2,520	1,635	3,261	6,700
	Landrover	493	300	248	664
	Suzuki	508	71	765	1,790
Sub-total		3,521	2,006	4,274	9,144
Assembling Services Bhd.	Toyota	5,605	3,528	5,836	13,038
	Daihatsu	1,734	1,919	3,083	5,802
	Hino	-	-	341	634
Sub-total		7,339	5,447	9,260	19,474
Automotive Manufacturer (M) Industries Sdn. Bhd.	Isuzu	1,760	1,734	1,716	3,596
	Tata	96	105	172	56
	Mitsubishi	266	284	1,352	2,506
	Suzuki	80	7	-	-
Sub-total		2,202	2,130	3,240	6,758
Cycle and Carriage Bintang Sdn. Bhd.	Mercedes	454	431	637	1,466
Kinabalu Motor Industries Sdn. Bhd.	Isuzu	549	438	662	514 **
	Pacific	-	-	55	6
Sub-total		549	438	717	520
Oriental Assembler Sdn. Bhd.	Honda	21	741	1	2
Sarawak Motor Industries Sdn. Bhd.	Hino	559	-	-	-
	Toyota	790	92	-	-
	Mitsubishi	117	-	-	-
	Pacific	9	-	-	-
Sub-total		1,475	92	-	-

Assembler	Vehicle Brand	1986	1987	1988	1989 *
Swedish Motor Assemblies Sdn. Bhd.	Volvo	21	20	-	-
Tan Chong Motor Assemblies Sdn. Bhd.	Nissan	3,337	3,745	5,218	9,946
	Subaru	114	69	292	432
	Volkswagen	1	11	1	-
Sub-total		3,452	3,825	5,511	10,378
Total		19,821	15,580	23,776	47,742

* Annualized based on January to July 1989 actual figures.
** Annualized based on January to June 1989 actual figures.

Source: MIDA.

Motor vehicle sales in Malaysia are expected to continue to grow in the succeeding years. The projected increase in sales is attributed to the sustained Malaysian economic growth estimated at around seven per cent for 1990 and the strong support from financial institutions via cheap vehicle loans. Interest rates for vehicle loans have gone down to as low as six per cent from their previous rates of eight to 10 per cent. Although car prices have gone up, the cheap loans have made car ownership still affordable.

3.1.3 Historical Volume of Vehicles Registered

Based on motor vehicle registrations, the number of motor vehicles in Malaysia increased at a compounded annual rate of 4.5 per cent from 1986 to 1989. In terms of vehicle population, motorcycles topped all the other types of vehicles, followed by cars. On the other hand, goods vehicles registered the biggest rate of increase at a compounded annual rate of 5.8 per cent from 1986 to 1989. Cars followed at 4.8 per cent, while motorcycles came in third at 4.3 per cent. (See Table 7.)

Table 7
MOTOR VEHICLE REGISTRATIONS IN MALAYSIA BY TYPE OF VEHICLE
1986-1989
(in units)

Type of Vehicle	1986	1987	1988	1989
Motorcycles	2,534,346	2,611,599	2,702,932	2,877,747
Cars	1,453,561	1,504,255	1,578,886	1,672,784
Buses	21,367	22,134	23,346	23,346
Goods vehicles	308,720	316,846	328,594	365,742
Other vehicles	142,634	144,528	149,158	149,158
Total	4,460,628	4,599,362	4,782,916	5,088,777

Note: Total registration figures include new registrations of imported as well as locally produced vehicles.

Source: Statistics Department Annual Report 1989, Malaysia.

3.1.4 Pertinent Regulations and Government Programs

3.1.4.1 The National Car Project

In October 1982, the Malaysian Government announced that the country would manufacture its own car as part of the country's industrialization program. Perusahaan Otomobil Sdn. Bhd. (Proton) was given the responsibility to manufacture, fabricate, and assemble the made-in-Malaysia car, the Saga. Proton is a joint venture between Heavy Industries Corporation Bhd. or HICOM (70%), Mitsubishi Motor Corporation (15%), and its parent company, Mitsubishi Corporation (15%).

Distribution, sales, and service of Proton Saga are undertaken by Edaran Otomobil Nasional Sdn. Bhd. (EON) which began as a joint venture between HICOM (45%), Perusahaan Sepadu Sdn. Bhd. (35%), United Assembly Services Sdn. Bhd. (15%), and Edaran Pekemas Bhd.

(5%). The equity structure has since then changed with HICOM (45%) sharing ownership with the Minister of Finance Incorporated (25%), a private company controlled by the Ministry, and Kuala Pura (30%), a company which is believed to be jointly owned by Mitsubishi Motor Corporation and Mitsubishi Corporation.

The Malaysian car is targeted at the mass market and comes in two engine sizes : 1,300 cc. and 1,500 cc. However, Proton may produce 2,000 cc. cars in the future as indicated in the Industrial Master Plan (IMP). The production of Proton Saga began in July 1985 and by the end of that year, 7,500 units had been produced. Based on the plan, full capacity of the production plant will be achieved by 1995. (See Table 8.)

Table 8
PRODUCTION SCHEDULE FOR PROTON SAGA
1985, 1990, and 1995
(in units)

Year	Production	Total Capacity	Unutilized Capacity
1985	7,500	80,000	72,500
1990	100,200	120,000	19,800
1995	120,000	120,000	-

Source: Malaysian Business, Malaysia, July 1985.

By the end of 1988, the Proton Saga had captured 73 per cent of the total passenger car market in the country. In 1989, the Proton Saga had a 64 per cent market share. (See Table 9.)

Table 9
SALES AND MARKET SHARE OF PROTON SAGA
1985-1989

Year	Sales (in units)	Proton Saga Market Share (%)	Other Passenger Cars' Market Share (%)
1985	7,494	32.5	67.5
1986	24,175	47.2	52.8
1987	24,858	65.2	34.8
1988	42,320	73.0	27.0
1989 *	43,132	64.1	35.9

* Annualized based on January to June 1989 actual figures.

Source: Edaran Otomobil Nasional Sdn. Bhd.

In terms of price, the Proton Saga had the lowest price for both the 1,300 cc. and 1,500 cc. engine capacities in 1986. For example, in the 1,300 cc. category, a Proton Saga costs US$1,379 less than a Nissan Sunny and US$2,412 less than a Honda Civic This competitive edge is the result of the 40 per cent tariff duty exemption on imported CKD packs for Proton Saga parts and the 50 per cent reduction in excise duties.

3.1.4.2 Local Content Requirement

In 1988, Malaysian-assembled vehicles were required to have a minimum 20 per cent local content. The government is expected to increase the local content requirement up to 60 per cent, this being the current norm in Australian and in many European car assembly/manufacturing industries.

The local content of the different locally assembled motor vehicles in 1988 was estimated to be as follows:

Motorcycles	-	60 per cent
Cars	-	30 per cent
Light commercial vehicles	-	20 per cent

The components/parts of locally assembled passenger and commercial vehicles which should be sourced locally under the government's mandatory deletion program are listed in Annex C. Among those included are mud flaps. Negotiations for the inclusion of additional components/parts in the deletion program are still ongoing. A list of these proposed parts is shown in Annex D. No time frame for the conclusion of the negotiations was given although the timing is said to be dependent on the market.

In mid-1986, 42 per cent of Proton Saga consisted of locally made parts. Local content, however, was expected to increase to 90 per cent by 1990. Of the rubber automotive components which Proton Saga uses, only the weatherstrips and load bearing mountings are imported. Weatherstrips are 100 per cent imported while load bearing mountings are 80 per cent imported. The increase in the production of the Proton Saga is therefore expected to lead to a corresponding increase in the demand for locally produced rubber automotive components.

Also in line with the objectives of the Industrial Master Plan (IMP) for the country's rubber products industry, the Malaysian government is encouraging greater domestic utilization of natural rubber. Consequently, the government has imposed high duties on EPDM, a synthetic rubber, although the government has accepted that certain

parts like radiator hoses cannot be made without using synthetic rubber.

3.1.4.3 Brand-to-Brand Complementation (BBC) Scheme

Under the BBC scheme, a government-endorsed project, specified parts/components of a specific vehicle brand are traded and used by manufacturers in the participating ASEAN countries. For instance, Malaysia can produce the body parts, Indonesia the steering system, the Philippines the engine and transmission, Thailand the gearbox, and Singapore the exhaust system. The participating countries will provide tariff preference, as well as local content accreditation for the vehicle components imported from another country if the participating countries have a local content program. The scheme aims to draw out economies of scale for each parts manufacturer which would be unachievable with a small, single country market.

The brand-to-brand complementation program is in line with the current thinking of major Japanese car makers. While meeting the desire of the individual ASEAN governments to increase the level of local content, it also fits in with the Japanese overall global strategy of doing more manufacturing outside Japan due to the high value of the yen and increasing production costs in their country. Toyota, for example, has already agreed to the scheme and will relocate some of its manufacturing facilities in Malaysia to manufacture certain components in exchange for other components made in other ASEAN countries.

3.2 DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS

3.2.1 Historical Demand

There are two major market segments for rubber automotive components: the automotive manufacturing industry which uses the components for the local assembly or production of motor vehicles and the replacement market which consists of vehicle owners who buy components in the retail market to replace wornout or damaged parts.

3.2.1.1 Automotive Manufacturing Industry

The demand for rubber automotive components for automotive production from 1986 to 1989 is shown in Table 10 below. In terms of number of pieces, rubber seals followed by grommets and weatherstrips registered the highest volume of demand.

Table 10
DERIVED DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY OF MALAYSIA
1986-1989
(in pieces)

	1986	1987	1988	1989 *
Load bearing mountings	371,652	280,392	477,972	670,296
Weatherstrips	550,148	416,944	720,624	993,256
Windshield wiper blades	123,884	93,464	159,324	223,432
Car mats	178,496	136,552	242,652	322,960
Mud flaps	479,688	395,038	558,672	786,804
Bumper stops	247,768	186,928	318,648	446,864
Grommets	1,136,684	955,098	1,274,040	1,814,020
Pedal pads	417,746	348,306	479,010	675,088
Rubber seals	1,169,850	946,510	1,371,663	1,951,920

* Based on annualized motor vehicle production.

Sources of basic data: Statistics Department Annual Report 1989, Malaysia
Interviews.

The estimates were based on the historical volume of automotive vehicle production in Malaysia. Specifically, to derive the 1986 to 1989 demand for rubber automotive components by the automotive manufacturing industry, the number of motor vehicles produced (Table 3) was multiplied by the average number of components per vehicle. The average number of rubber components required for each vehicle was determined from interviews with major assemblers. (See Table 11.)

The formula used is shown in Annex E.

Table 11
AVERAGE NUMBER OF RUBBER AUTOMOTIVE COMPONENTS
FOR EACH TYPE OF VEHICLE
IN ASEAN COUNTRIES
(in pieces)

	Motorcycles	Cars	AUVs	LCVs	Trucks & Buses
Load bearing mountings	-	6	6	6	6
Weatherstrips	-	10	6	6	3
Windshield wiper blades	-	2	2	2	2
Car mats	-	4	2	-	-
Mud flaps	2	4	4	4	4
Bumper stops	-	4	4	4	4
Grommets	6	6	10	10	15
Pedal pads	2	3	3	3	3
Rubber seals	4	10	10	15	15

Notes: AUVs - Asian Utility Vehicles.
LCVs - Light Commercial Vehicles.

Source: Interviews.

3.2.1.2 Replacement Market

Secondary data on the size of the replacement market for rubber automotive components are not available. To estimate the volume of replacement demand, the replacement rate for each rubber automotive component was determined from interviews with vehicle assemblers as well as rubber automotive components manufacturers. Conservative replacement rates were assumed although the components can be actually replaced earlier:

Component	Replacement Rate
Load bearing mountings	After 10 years
Weatherstrips	After 10 years
Windshield wiper blades	After 5 years
Car mats	After 10 years
Mud flaps	After 10 yea. but only light commercial vehicles and trucks and buses replace this component
Bumper stops	Not usually replaced except in cases of accidents
Grommets	After 10 years
Pedal pads	After 5 years
Rubber seals	After 10 years

Source: Interviews.

With the replacement assumed after five or ten years, the percentage of registered vehicles likely to remain on the road after five and after ten years was estimated based on interviews (see Annex F) and applied to the volume of new registrations in Malaysia in 1984 and 1979 (see Annex G), to get the approximate number of five- and ten-

year old vehicles, respectively, as of 1989. Out of these five- and ten-year old vehicles, only a certain proportion was assumed to replace rubber components and, among those vehicles expected to replace components, only a certain number of components was assumed to need replacement. These assumptions, which were based on interviews with vehicle repair shops in the Philippines, are presented in Annexes H and I. They were presumed to also hold in Malaysia and in the other ASEAN countries.

In summary, therefore, to compute for the 1989 replacement demand for, say, load bearing mountings, the 1979 volume of new registrations was multiplied by the estimated percentage expected to remain on the road after ten years; this was then multiplied by the estimated percentage of ten-year old vehicles expected to replace load bearing mountings, and by the expected number of load bearing mountings that would need replacement. The formula used is shown in Annex E while sample computations are presented in Annex J.

Using the foregoing estimation procedure, the derived replacement demand in Malaysia for each of the rubber automotive components in 1989 is shown in Table 12.

Weatherstrips followed by car mats and pedal pads registered the highest volume of demand in 1989. The estimated replacement demand for car mats includes plastic car mats that are substitutes for rubber mats since there is no data on the extent of substitution between the two products. The replacement demand for mud flaps, on the other hand, represents demand for only commercial vehicles, trucks, and buses since mud flaps are not usually replaced in cars and motorcycles.

Replacement demand for bumper stops is minimal because they are replaced only in certain accident situations.

Table 12
1989 REPLACEMENT DEMAND FOR
RUBBER AUTOMOTIVE COMPONENTS
IN MALAYSIA
(in pieces)

Component	Total
Load bearing mountings	90,949
Weatherstrips	317,636
Windshield wiper blades	435,576
Car mats	273,640
Mud flaps	5,421
Bumper stops	minimal
Grommets	56,169
Pedal pads	730,901
Rubber seals	138,512

Sources of basic data: Statistics Department Annual Report 1989, Malaysia, Interviews.

3.2.1.3 Aggregate Demand

The combined 1989 aggregate demand for rubber automotive components by the automotive manufacturing industry and the replacement market in Malaysia is shown in Table 13.

Table 13
COMBINED 1989 AGGREGATE DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS
BY THE AUTOMOTIVE MANUFACTURING INDUSTRY AND
THE REPLACEMENT MARKET OF MALAYSIA
(in pieces)

Rubber Automotive Component	Volume
Load bearing mountings	761,245
Weatherstrips	1,310,892
Windshield wiper blades	659,008
Car mats	596,600
Mud flaps	792,225
Bumper stops	446,864
Grommets	1,870,189
Pedal pads	1,405,989
Rubber seals	2,090,432

Sources: Tables 10 and 12.

3.2.2 Demand Projections

3.2.2.1 Automotive Manufacturing Industry

To project the demand for rubber automotive components for automotive production in Malaysia from 1990 to 2000, the projected volume of motor vehicle production by type of vehicle was then multiplied by the average number of rubber automotive components per vehicle type, and the resulting figures for the various vehicle types added up.

The growth rate of motor vehicle production was assumed to follow the projected growth rate of Malaysia's real GDP. Using average historical 1978 to 1987 GDP growth rate as basis for projections, a five per cent annual increase was assumed.

Table 14 shows the projected demand for rubber automotive components by the Malaysian automotive manufacturing industry from 1990 to 2000.

Table 14
PROJECTED DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY
THE AUTOMOTIVE MANUFACTURING INDUSTRY OF MALAYSIA
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	703,811	739,001	775,951	814,749	855,486	898,261	943,174	990,332	1,039,849	1,091,842	1,146,434
Weatherstrips	1,042,919	1,095,065	1,149,818	1,207,309	1,267,674	1,331,058	1,397,611	1,467,491	1,540,866	1,617,909	1,698,805
Windshield wiper blades	234,604	246,334	258,650	271,583	285,162	299,420	314,391	330,111	346,616	363,947	382,145
Car mats	339,108	356,063	373,867	392,560	412,188	432,797	454,437	477,159	501,017	526,068	552,371
Mud flaps	826,144	867,451	910,824	956,365	1,004,183	1,054,393	1,107,112	1,162,468	1,220,591	1,281,621	1,345,702
Bumper stops	469,207	492,668	517,301	543,166	570,324	598,840	628,783	660,222	693,233	727,894	764,289
Grommets	1,904,721	1,999,957	2,099,955	2,204,953	2,315,200	2,430,960	2,552,508	2,680,134	2,814,140	2,954,847	3,102,590
Pedal pads	708,842	744,285	781,499	820,574	861,602	904,682	949,917	997,412	1,047,283	1,099,647	1,154,630
Rubber seals	2,049,516	2,151,992	2,259,591	2,372,571	2,491,200	2,615,759	2,746,547	2,883,875	3,028,069	3,179,472	3,338,446

Sources of basic data: Statistics Department Annual Report 1989, Malaysia
Interviews.

3.2.2.2 Replacement Market

The projected replacement demand for rubber automotive components in Malaysia from 1990 to 2000 is shown in Table 15. This was derived using the same assumptions and method employed in estimating the 1989 replacement demand, this time using data on new registrations from 1980 to 1989. New registrations of motor vehicles after 1989 were projected by adding projected automotive production and importations. Projected motor vehicle importations were assumed to follow the average ratio of imports to total vehicle production from 1986 to 1988 of about six imported motor vehicles for every one hundred locally produced vehicles.

Projected replacement demand for rubber automotive components does not necessarily increase over the years since it is based on the volume of new registrations five and/or ten years before.

3.2.2.3 Aggregate Demand

Combined projected demand from 1990 to 2000 by the automotive manufacturing industry and the replacement market in Malaysia is presented in Table 16.

Table 15
PROJECTED REPLACEMENT DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS
IN MALAYSIA
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	129,791	128,356	142,431	149,440	156,943	126,088	91,653	71,558	88,978	119,104	125,107
Weatherstrips	453,289	448,278	494,243	524,583	548,844	436,483	319,083	253,099	299,132	408,291	428,783
Windshield wiper blade	445,275	380,051	366,364	412,359	478,766	438,296	407,405	403,490	465,537	552,594	603,726
Car mats *	390,504	386,186	424,954	452,636	472,998	375,406	274,857	218,625	256,609	351,782	369,371
Mud flaps	7,736	7,650	9,113	8,387	9,210	8,311	5,684	3,617	7,769	8,804	9,260
Grommets	80,157	79,271	89,509	95,141	92,579	78,082	55,631	39,729	55,174	77,540	81,438
Pedal pads	759,266	642,832	610,135	705,953	812,869	759,871	708,150	694,784	812,956	976,847	1,067,695
Rubber seals	197,666	195,480	220,457	232,904	230,226	192,841	137,688	99,701	136,819	189,623	199,188

* Includes demand for plastic car mats which could not be estimated separately from rubber car mats in the absence of data on degree of substitution.

Sources of basic data: Statistics Department Annual Report 1989, Malaysia
Interviews.

Table 16
COMBINED PROJECTED DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY
THE AUTOMOTIVE MANUFACTURING INDUSTRY AND THE REPLACEMENT MARKET OF MALAYSIA
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	833,601	867,357	918,382	964,189	1,012,429	1,024,348	1,034,827	1,061,890	1,128,827	1,210,945	1,271,541
Weatherstrips	1,496,208	1,543,343	1,644,061	1,731,891	1,816,518	1,767,541	1,716,694	1,720,590	1,839,998	2,026,200	2,127,587
Windshield wiper blades	679,879	626,385	625,014	683,942	763,928	737,716	721,796	733,600	812,154	916,541	985,871
Car mats	729,612	742,250	798,821	845,196	885,185	808,203	729,294	695,784	757,626	877,850	921,742
Mud flaps	833,880	875,101	919,937	964,752	1,013,394	1,062,704	1,112,796	1,166,085	1,228,360	1,290,424	1,354,962
Bumper stops	469,207	492,668	517,301	543,166	570,324	598,840	628,783	660,222	693,233	727,894	764,289
Grommets	1,984,878	2,079,228	2,189,464	2,300,093	2,407,779	2,509,042	2,608,139	2,719,863	2,869,314	3,032,388	3,184,027
Pedal pads	1,468,108	1,387,117	1,391,634	1,526,527	1,674,471	1,664,553	1,658,067	1,692,197	1,860,239	2,076,494	2,222,324
Rubber seals	2,247,182	2,347,472	2,480,048	2,605,475	2,721,425	2,808,600	2,884,235	2,983,576	3,164,888	3,369,095	3,537,634

Sources: Tables 14 and 15.

3.3 SUPPLY

3.3.1 Sources of Supply

In 1985, all rubber parts used for automotive production by original equipment manufacturers were imported together with the CKD packs, free of import duty. The CKD packs came from Japan, the United Kingdom, Italy, Australia, France, Germany, and Sweden. A major portion of the replacement demand for rubber automotive components was also satisfied by imports, as there was no large-scale manufacturer of rubber automotive components in Malaysia then. By 1989, however, ten major local producers of rubber automotive components had been set up in the country.

Except for car mats and mud flaps, most of the rubber components used in the production or assembly of vehicles are mainly imported. Although load bearing mountings, bumper stops, grommets, and pedal pads and seals are locally produced, these items are mainly sold in the replacement market and partly to Proton. Weatherstrips are entirely imported from abroad. Windshield wiper blades are also largely imported as part of the windscreen wiper unit.

Proton, however, uses mainly locally produced car mats, mud flaps, bumper stops, grommets, pedal pads and seals, and windshield wiper blades. On the other hand, 80 per cent of its load bearing mountings and 100 per cent of its weatherstrips are imported.

3.3.1.1 Imports

The import statistics on windscreen wipers, which include the wiper blades, are lumped together with defrosters and demisters. The value of imports of these components grew at an annual rate of 21 per cent from CIF US$1.1 million in 1987 to CIF US$1.5 million in 1989. Import volume, likewise, increased from 1.2 million pieces in 1988 to 1.3 million pieces in 1989. (See Table 17.)

Table 17
IMPORTS OF WINDSCREEN WIPER, DEFROSTERS AND DEMISTERS OF MALAYSIA
BY COUNTRY OF ORIGIN
1987-1989
(volume in pcs.; value in thousand US$ CIF)

	1987		1988		1989	
Country	Volume	Value	Volume	Value	Volume	Value
Japan	n.a.	327	676,917	485	929,371	524
Belgium	n.a.	48	104,151	422	175,524	606
Taiwan	n.a.	271	212,999	267	62,232	63
West Germany	n.a.	157	45,250	256	24,935	214
Canada	n.a.	3	54,129	89	21,602	45
South Korea	n.a.	32	39,678	45	14,161	18
United Kingdom	n.a.	140	12,904	46	6,934	20
Sweden	n.a.	20	501	4	6,253	16
Italy	n.a.	4	606	2	4,209	17
Netherlands	n.a.	12	4,939	17	2,202	9
France	n.a.	13	6,753	11	1,211	5
Singapore	n.a.	6	44,011	23	423	1
Others	n.a.	36	4,482	22	6,998	7
Total	n.a.	1,063	1,207,320	1,689	1,256,055	1,545

n.a. - not available.

Sources: Malaysian Export Trade Centre (MEXPO)
International Trade Division
Ministry of Trade and Industry
Department of Statistics.

Japan is a major supplier of windscreen wiper units of Malaysia. Imports from Japan increased from CIF US$327 thousand in 1987 to CIF US$524 thousand in 1989, growing at an average annual rate of 27 per cent. Belgium is another major supplier of windscreen wiper units of Malaysia. It significantly increased its exports of windscreen wiper units to Malaysia from CIF US$48 thousand in 1987 to CIF US$606 thousand in 1989, recording an annual growth rate of 255 per cent during the three-year period. Other major suppliers of windscreen wiper units are Taiwan, West Germany, and Canada although Taiwan considerably decreased its exports to Malaysia from 1988 to 1989 by 76 per cent in terms of

value and by 71 per cent in terms of volume.

Malaysian imports of bumpers and its parts for motor vehicles was recorded at CIF US$817 thousand or 95 thousand pieces in 1988 and CIF US$388 thousand or 45 thousand pieces in 1989. The major suppliers of bumpers and its parts include Japan, Taiwan, U.S., and West Germany. (See Table 18.)

Table 18
IMPORTS OF BUMPERS AND PARTS THEREOF FOR MOTOR VEHICLES OF MALAYSIA
BY COUNTRY OF ORIGIN
1987-1989
(Volume in pcs.; value in thousand US$ CIF)

	1987		1988		1989	
Country	Volume	Value	Volume	Value	Volume	Value
Japan	n.a.	n.a.	51,105	438	21,668	189
Taiwan	n.a.	n.a.	24,944	155	18,635	105
U.S.	n.a.	n.a.	2,395	61	2,025	2
West Germany	n.a.	n.a.	5,012	93	1,107	60
Thailand	n.a.	n.a.	6,945	21	552	2
United Kingdom	n.a.	n.a.	2,737	7	377	3
Italy	n.a.	n.a.	830	23	128	3
Sweden	n.a.	n.a.	140	5	94	2
Singapore	n.a.	n.a.	262	1	90	1
France	n.a.	n.a.	5	*	17	17
Mexico	n.a.	n.a.	5	*	-	-
India	n.a.	n.a.	228	2	-	-
Others	n.a.	n.a.	426	10	118	4
Total	n.a.	n.a	95,034	817	44,811	388

n.a. - not available.

* Less than US$1,000.

Sources: Malaysian Export Trade Centre (MEXPO)
International Trade Division
Ministry of Trade and Industry
Department of Statistics.

3.3.1.2 Exports

Although Malaysia imports windscreen wipers and bumpers and parts for motor vehicles, the country also exports the same products.

In 1989, the biggest importers were Japan for windscreen wipers, defrosters, and demisters, and Singapore for bumpers and parts thereof for other motor vehicles. (See Table 19.)

Table 19
EXPORTS OF RUBBER AUTOMOTIVE COMPONENTS OF MALAYSIA
1987-1989
(volume in pcs.; value in US$ FOB)

Windscreen Wipers, Defrosters, and Demisters

	1987		1988		1989	
Country	Volume	Value	Volume	Value	Volume	Value
Japan	n.a.	7,846	1	9	15,351	3,154
Singapore, Republic of	n.a.	15,870	12,426	2,008	50	204
Germany, Federal Republic of	n.a.	794	-	-	-	-
Italy	n.a.	1,507	-	-	-	-
Netherlands	n.a.	4,128	-	-	-	-
Sweden	-	-	9	44	-	-
Taiwan	n.a.	4,470	9,000	1,144	-	-
Others	n.a.	11,991	150	545	40,602	15,350
Total	n.a.	46,606	21,586	3,750	56,003	18,708

Bumpers and Parts Thereof for Other Motor Vehicles

Country	1987		1988		1989	
	Volume	Value	Volume	Value	Volume	Value
Singapore, Republic of	n.a.	n.a.	6,601	63,870	87,247	69,208
United Kingdom	n.a.	n.a.	1	101	606	6,777
Mexico	n.a.	n.a.	-	-	445	11,963
Taiwan	n.a.	n.a.	14	298	11	206
Thailand	n.a.	n.a.	75	151	2	2,548
Germany, Federal Republic of	n.a.	n.a.	1	4	-	-
Japan	n.a.	n.a.	25,283	10,155	-	-
India	n.a.	n.a.	1,716	4,053	-	-
Others	n.a.	n.a.	308	1,772	1,330	4,145
Total	n.a.	n.a.	33,999	80,404	89,641	94,847

n.a. - not available.

Source: Department of Statistics.

Also exported by Malaysia are car mats and mud flaps. However, export statistics on these specific items are not available.

3.3.2 Profile of Major Producers

Table 20 shows the major manufacturers of selected rubber automotive components in Malaysia. There are currently seven major local producers of car mats and three ma..ufacturers of mud flaps. Only one manufactures load bearing mountings. There are also several producers of bumper stops, grommets, and pedal pads and seals although they mainly supply the replacement market. One manufacturer of bumper stops and another manufacturer of grommets produce these items exclusively for Proton.

There is no major local producer of windshield wiper blades; these items are mostly sourced from other countries as part of a windscreen wiper unit. The locally made wiper blades, therefore, are not acceptable as substitutes by the local assemblers. Moreover, the major foreign suppliers of motor vehicles in

Malaysia have their own suppliers of windscreen wiper units which include the wiper blades.

There is also no local producer of weatherstrips in Malaysia.

Table 20
MAJOR PRODUCERS OF
RUBBER AUTOMOTIVE COMPONENTS IN MALAYSIA

Component	Major Local Producers
Load bearing mountings	Malaysian Auto Products Sdn. Bhd.
Weatherstrips	none (mainly imported)
Windshield wiper blades	no major local producer
Car mats	Chep Huat Rubber Works Sdn. Bhd. United Industries Sdn. Bhd. Plaat Malaysia Sdn. Bhd. Len Brothers Rubber Products Industries Sdn. Bhd. Fung Keong Rubber Manufactory (M) Sdn. Bhd. Titiwang Rubber Industries Sdn. Bhd. Tan Chong and Sons Motor Co. Sdn. Bhd.
Mud flaps	United Industries Sdn. Bhd. Plaat Malaysia Sdn. Bhd. Titiwang Rubber Industries Sdn. Bhd.
Bumper stops	Kumpulan Jebco (M) Sdn. Bhd. * Malaysian Auto Products Sdn. Bhd. **
Grommets	Wesma Rubber Products * Malaysian Auto Products Sdn. Bhd. **
Pedal pads and seals	Malaysian Auto Products Sdn. Bhd. **

* Produces exclusively for Perusahaan Otomobil Nasional Sdn. Bhd.
** Mainly serves the local replacement market.

Source: Interviews.

3.3.2.1 Production and Production Capacity

Malaysia Auto Products Sdn. Bhd. manufactures a wide range of rubber automotive components which include load bearing mountings, bumper stops, grommets, and pedal pads and seals. The company's production volume and production capacity for these components are not available. However, sales value of rubber automotive components in 1987 by Malaysia Auto Products Sdn. Bhd. was estimated at US$0.4 million. (See Table 21.)

Table 21
PROFILE OF MAJOR LOCAL PRODUCERS OF
RUBBER AUTOMOTIVE COMPONENTS IN MALAYSIA

Name of Company	Type of Product	Annual Production Capacity (pcs.)	Production (pcs.) 1986	1987	1988
Malaysia Auto Products Sdn. Bhd.	Load bearing mountings	n.a.	n.a.	US$0.4 million *	n.a.
	Bumper stops	n.a.	n.a.		n.a.
	Grommets	n.a.	n.a.		n.a.
	Pedal pads and seals	n.a.	n.a.		n.a.
Chep Huat Rubber Works Co. Sdn. Bhd.	Car mats	60,000 - 72,000	n.a.	n.a.	n.a.
Kumpulan Jebco (M) Sdn. Bhd.	Bumper stops (Solely for Proton)	156,000	n.a.	n.a.	n.a.
Mesma Rubber Products	Grommets (Solely for Proton)	Depends on impression of toolings or moulds	360,000 - 480,000	360,000 - 480,000	360,000 - 480,000
United Industries Sdn. Bhd.	Car mats	360,000	n.a.	n.a.	n.a.
	Mud flaps	n.a.	n.a.	n.a.	n.a.
Plast Malaysia Sdn. Bhd.	Car mats	1,000,000	1,000,000	1,000,000	1,000,000
	Mud flaps	n.a.	n.a.	n.a.	n.a.
Titiwang Rubber Industries Sdn. Bhd.	Car mats	600,000	300,000	330,000	363,000
	Mud flaps	n.a.	n.a.	n.a.	n.a.
Fung Keong Rubber Manufactory (M) Sdn. Bhd.	Car mats	936,000	n.a.	US$13.5 million *	US$17.6 million *
Len Brothers Rubber Product Industries Sdn. Bhd.	Car mats	1,700,000	190,474	356,551	1,128,284
Tan Chong and Sons Motor Co.	Car mats	60,000 (sets)	n.a.	n.a.	n.a.

n.a. - not available.

* Sales value.

Source: Interviews.

Chep Huat Rubber Works Co. Sdn. Bhd. manufactures car mats and has an annual production capacity of between 60 to 72 thousand pieces of this item.

Kumpulan Jebco (M) Sdn. Bhd. produces bumper stops mainly for Proton. Its annual production capacity is 156 thousand bumper stops.

Wesma Rubber Products is a manufacturer of grommets. It indicated a production level of between 360 thousand pieces to 480 thousand pieces a year from 1986 to 1989. Like Kumpulan Jebco (M) Sdn. Bhd., Wesma Rubber Products also produces grommets solely for Proton.

United Industries Sdn. Bhd. manufactures car mats and mud flaps. Its annual production capacity for car mats is 360 thousand pieces.

Plaat Malaysia Sdn. Bhd. is another producer of car mats in the country. It recorded the second largest annual production capacity of one million pieces. Based on interviews, its estimated production level from 1986 to 1988 was also one million a year, indicating that the producer operated at full capacity during the period. Plaat Malaysia Sdn. Bhd. also produces mud flaps. Its production volume and production capacity for mud flaps, however, were not given.

Another company which produces car mats and mud flaps is Titiwang Rubber Industries Sdn. Bhd. It has an annual production capacity of 600 thousand car mats. Its production level increased from 300 thousand pieces in 1986 to 363 thousand pieces in 1988.

Fung Keong Rubber Manufactory (M) Sdn. Bhd. manufactures car mats. Its annual production capacity of this item is 936 thousand pieces. Production levels were not given. However, sales value was estimated at US$13.5 million in 1987 and US$17.6 million in 1988.

Len Brothers Rubber Products Industries Sdn. Bhd. which produces car mats indicated the largest production capacity of 1.7 million car mats annually. Its production level significantly increased from 190 thousand pieces in 1986 to about 1.1 million pieces in 1988, recording an average annual growth rate of 143 per cent.

Tan Chong and Sons Motor Co. Sdn. Bhd. also produces car mats for passenger cars. It has a capacity to produce 5,000 sets of car mats per month or 60,000 sets a year. This production level, however, will be increased if necessary. Tan Chong and Sons Motor Co. Sdn. Bhd. has been the local franchise holder of Nissan products for over 30 years. The company is a wholly owned subsidiary of Tan Chong Motor Holdings Sdn. Bhd., a firm involved in the assembly and distribution of vehicles and in the manufacture and export of automotive parts.

3.3.2.2 Geographic Market Segments

Local producers of rubber automotive components cater both to the domestic and export markets. In fact, seven out of the nine local producers of rubber automotive components export to other countries. Two of them, Plaat Malaysia Sdn. Bhd. and Fung Keong Rubber Manufactory (M) Sdn. Bhd., are export-oriented, selling more to other countries than to the local market. (See Table 22.)

Table 22
BREAKDOWN OF RUBBER AUTOMOTIVE COMPONENT SALES
OF MANUFACTURERS IN MALAYSIA BY GEOGRAPHICAL MARKET

Name of Company	Type of Product	Percentage of sales to Local Market	Percentage of sales to Export Market
Malaysia Auto Products Sdn. Bhd.	Load bearing mountings Bumper stops Grommets Pedal pads	85 %	15 %
Chep Huat Rubber Works Co. Sdn. Bhd.	Car mats	100 %	-
Kumpulan Jebco (M) Sdn. Bhd.	Bumper stops (Solely for Proton)	Depends on whether cars are sold locally or exported.	
Mesma Rubber Products	Grommets (Solely for Proton)	100 %	-
United Industries Sdn. Bhd.	Car mats Mud flaps	50 %	50 %
Plast Malaysia Sdn. Bhd.	Car mats Mud flaps	5 %	95 %
Titiwang Rubber Industries Sdn. Bhd.	Car mats Mud flaps	85 %	15 %
Fung Keong Rubber Manufactory (M) Sdn. Bhd.	Car mats	14 %	86 %
Len Brothers Rubber Products Industries Sdn. Bhd.	Car mats	51 %	49 %

Source: Interviews.

3.3.2.3 Domestic Market Segments

Four of these manufacturers of rubber automotive components cater solely to the automotive manufacturing industry (automotive assemblers and producers) while one supplies the replacement market only. (See Table 23.)

Table 23
PERCENTAGE BREAKDOWN OF RUBBER AUTOMOTIVE COMPONENT SALES OF MANUFACTURERS IN MALAYSIA BY MARKET SEGMENT

Name of Company	Type of Product	Percentage of sales to: Automotive Manufacturers/ Assemblers	Percentage of sales to: Replacement Market
Malaysia Auto Products Sdn. Bhd.	Load bearing mountings Bumper stops Grommets Pedal pads and seals	10 %	90 %
Chep Huat Rubber Works Co. Sdn. Bhd.	Car mats	-	100 %
Kumpulan Jebco (M) Sdn. Bhd.	Bumper stops	100 %	-
Mesma Rubber Products	Grommets	100 %	-
United Industries Sdn. Bhd.	Car mats Mud flaps	100 %	-
Plaat Malaysia Sdn. Bhd.	Car mats Mud flaps	100 %	-
Titiwang Rubber Industries Sdn. Bhd.	Car mats Mud flaps	35 %	65 %
Fung Keong Rubber Manufactory (M) Sdn. Bhd.	Car mats	At least 80 % (Toyota, BMW, Mercedes Benz, Volvo)	Less than 20 %
Len Brothers Rubber Products Industries Sdn. Bhd.	Car mats	30 %	70 %
Tan Chong and Sons Motor Co. Sdn. Bhd.	Car mats	*	*

* Not indicated.

Source: Interviews.

3.3.2.4 Level of Technology

In general, the manufacturing process employed by the rubber products industry uses both conventional and advanced methods. Locally owned companies which are small- and medium-size still use conventional ways of processing without proper quality control facilities. They still face the problem of keeping updated on and acquiring the latest state-of-the-art technology. In comparison, large firms which are wholly owned by foreign multinationals or jointly established by foreign and local partners employ modern and sophisticated technology. This helps them produce parts of high standards for both domestic and export markets.

Malaysia Auto Products Sdn. Bhd. claims that its technology is at par with Japanese technology. Chep Huat Rubber Works Co. Sdn. Bhd. also indicated that it employs a very advanced technology and that it does not see obsolescence in the near future. On the other hand, Fung Keong Rubber Manufactory (M) Sdn. Bhd. said it still uses low quality equipment in its manufacturing process.

Tan Chong and Sons Motor Co. Sdn. Bhd. also claims that it employs technology which is competitive with Japanese technology. This is verified by Japanese engineers who visited the company's local plants several times.

The other manufacturers did not indicate the level of technology currently employed in their factories.

3.3.2.5 Technical and Marketing Tie-ups

Len Brothers Rubber Products Industries Sdn. Bhd. indicated that it has tie-ups with its major buyers like Nissan Japan and Ansell International. Plaat Malaysia Sdn. Bhd. is 42 per cent owned by a foreign tie-up although the

latter's identity was not indicated. It also has tie-ups with its major buyers in the U.S. and Australia.

In 1988, Tan Chong and Sons Motor Co. Sdn. Bhd. was able to secure a five-year technical licensing agreement with Kinugawa Rubber Industrial Co. Ltd. Under the agreement, Tan Chong will supply rubber car mats to Kinugawa which is about 30 per cent owned by Nissan Motor Co. Ltd., for the popular Nissan Sunny. The technical alliance is to ensure that the car mats meet strict Japanese quality requirements.

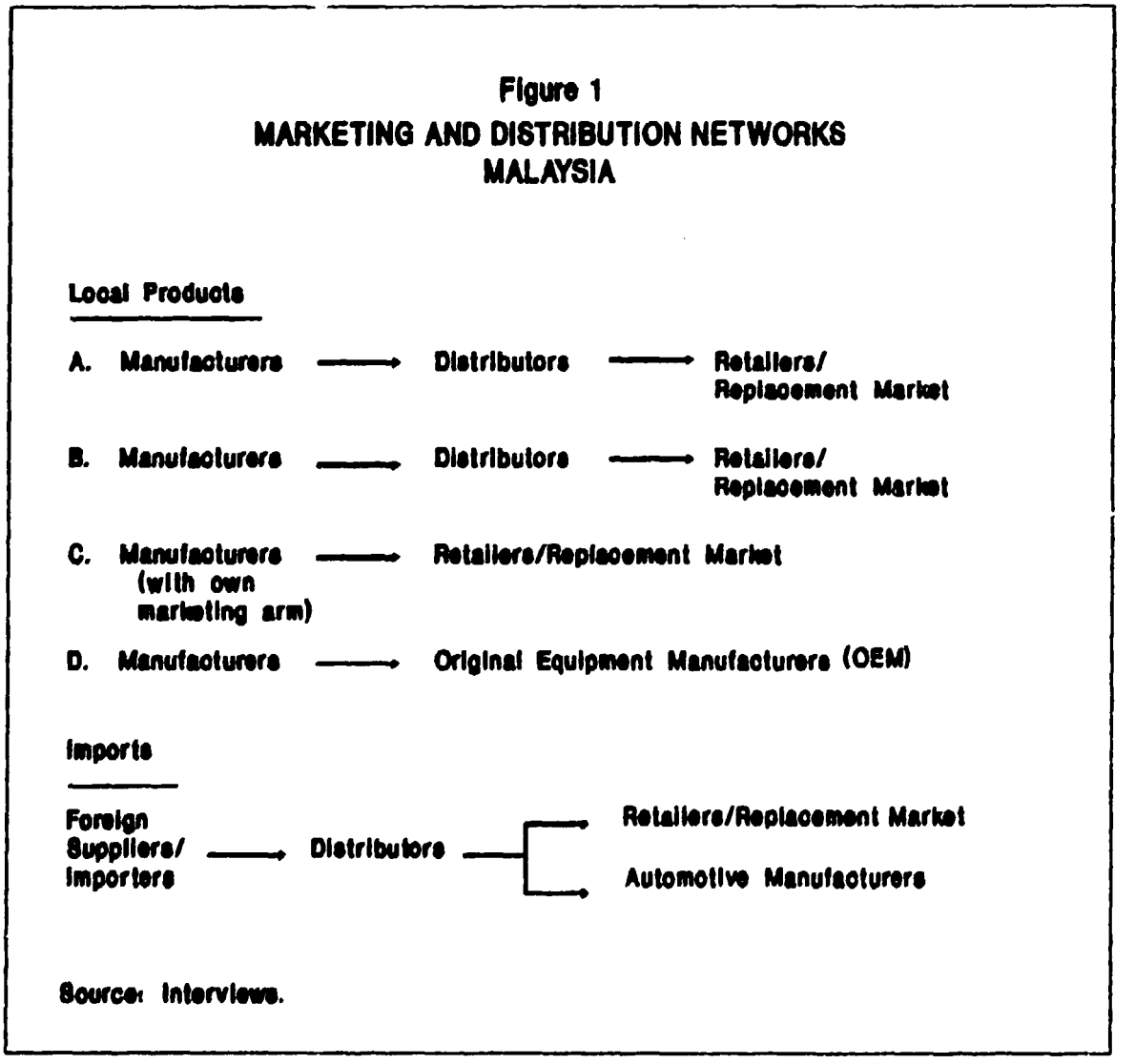
Kinugawa Rubber Industrial Co. Ltd. is a manufacturer of rubber automotive and synthetic resin parts. It is one of Japan's largest original equipment manufacturer (OEM) suppliers. It has three Japanese suppliers of car mats. Tan Chong and Sons Motor Co. Sdn. Bhd. was its first non-Japanese supplier.

3.3.3 Distribution and Trade Practices

3.3.3.1 Channels of Distribution

The supply of rubber automotive components to the local market usually flows through the following channels:

Figure 1
MARKETING AND DISTRIBUTION NETWORKS
MALAYSIA



Source: Interviews.

As shown in the chart, the supply of local rubber automotive components either passes from the manufacturers to distributors before reaching retailers and the replacement market, or is sold directly to retailers by the manufacturer's own marketing arm. One channel of distribution shows the original equipment manufacturers purchasing directly from the manufacturers of rubber automotive components.

As with local products, imported parts also pass through distributors before reaching the retailers and the replacement market and the automotive manufacturers.

3.3.3.2 Trade Terms

Based on interviews, rubber automotive components are sold on both cash and credit terms. For cash sales, a discount or rebate is usually given to the buyer. Common credit terms granted are 30, 50, 60, and 90 days. The credit term granted depends on the credit worthiness of clients.

3.3.3.3 Prices

Table 24 shows the local retail and original equipment (OE) prices (that is, direct selling prices to automotive manufacturers) of selected rubber automotive components for Proton models. Note that the OE prices are much lower compared with the retail prices because of the retailers' mark-up.

Table 24
LOCAL PRICES OF RUBBER AUTOMOTIVE COMPONENTS IN MALAYSIA

Component	Retail Price (US$ per pc)	OE Price (US$ per pc)
Load bearing mountings	111.25	29.65
Weatherstrips *	89.00	27.80
Windshield wiper blades	0.75	0.25
Car mats *	11.85	5.55
Mud flaps *	5.95	3.90
Grommets and rubber seals	2.35	2.30

* Per car set.

Source: Interviews.

The table below presents another set of local retail prices of selected original rubber automotive components for Toyota cars.

Table 25
CURRENT LOCAL PRICES OF ORIGINAL TOYOTA RUBBER AUTOMOTIVE COMPONENTS IN MALAYSIA

Component	Unit Price Range (in US$)	Origin
Weatherstrips (for windshield)	57.50 - 146.40	Imported from Japan
Windshield wiper blades	2.00 - 12.90	Imported from Japan
Car mats	8.40 - 27.35	Locally produced
Mud flaps	4.10 - 27.35	Locally produced

Source: Pakatan Permai Sdn. Bhd. (an agent for UMW Toyota Motor Sdn. Bhd.)

The prices listed in the table are considered relatively high. For example, some local manufacturers of car mats who were interviewed indicated a price range of between US$0.40 to US$3.00 per piece, much lower compared with the price range of the same item for Toyota. Proton indicated a retail price of US$0.75 and an OE price of US$0.25 for a windshield wiper blade, much lower than the price of the same item for Toyota (US$2.00 - US$12.90). The higher prices are due to the fact that the items are original parts and have to pass high Japanese quality standards set by Toyota and, in certain cases, due to additional imputed costs such as import duty and freight charges.

UMW Toyota Motor Sdn. Bhd. gives its distributors a 40 per cent discount off the list prices for locally made components and a 50 per cent discount for imported parts. The distributors then sell the products at a discount of between 20 per cent to 40 per cent to the retailers.

3.3.4 Raw Materials

High-quality natural rubber at advantageous prices is locally available in Malaysia, the country being renowned worldwide as a leading producer of natural rubber. Manufacturers of rubber automotive components, therefore, generally prefer to use a larger proportion of natural rubber than synthetic rubber. Moreover, local manufacturers producing rubber automotive components for the export market can purchase natural rubber at a discount from authorized government agencies.

As shown in Table 26, all the major rubber automotive manufacturers, except for Wesma Rubber Products and Tan Chong and Sons Motor Co. Sdn. Bhd., use a large proportion of natural rubber ranging from 75 per cent to 100 per cent. In fact, four out of the ten producers of rubber automotive components who were interviewed use 100 per cent natural rubber in their products.

Tan Chong and Sons Motor Co. Sdn. Bhd. uses 40 per cent natural rubber and 60 per cent synthetic rubber in its car mats. On the other hand, Wesma Rubber Products uses 100 per cent synthetic rubber in producing grommets for reasons not indicated. At present, the rubber products industry of Malaysia imports all its synthetic rubber.

Table 26
TYPE OF RUBBER USED BY MAJOR RUBBER AUTOMOTIVE COMPONENTS PRODUCERS IN MALAYSIA

Name of Company	Type of Product	Percentage Composition	
		Natural Rubber	Synthetic Rubber
Malaysia Auto Products Sdn. Bhd.	Load bearing mountings Bumper stops Grommets Pedal pads and seals	75 %	25 %
Chep Huat Rubber Works Co. Sdn. Bhd.	Car mats	100 %	-
Kumpulan Jebco (M) Sdn. Bhd.	Bumper stops	100 %	-
Wesma Rubber Products	Grommets	-	100 %
United Industries Sdn. Bhd.	Car mats Mud flaps	100 %	-
Plaat Malaysia Sdn. Bhd.	Car mats Mud flaps	90 %	10 %
Titiwang Rubber Industries Sdn. Bhd.	Car mats Mud flaps	Both are used, depending on the quality of mats required.	
Fung Keong Rubber Manufactory (M) Sdn. Bhd.	Car mats	100 %	-
Len Brothers Rubber Products Industries Sdn. Bhd.	Car mats	80 %	20 %
Tan Chong and Sons Motor Co. Sdn. Bhd.	Car mats	40 %	60 %

Source: Interviews.

4. EXPORT OPPORTUNITIES

4.1 Indonesia

4.1.1 Background on the Automotive Industry

4.1.1.1 Industry Structure

Data on the major motor vehicle assemblers in Indonesia show that the industry has the capacity to produce as much as 392,500 units of motor vehicles. (See Table 27.)

Table 27
PRODUCTION CAPACITY OF MAJOR
AUTOMOTIVE VEHICLE ASSEMBLERS IN INDONESIA
(in units)

Name of Company	Production Capacity
Multinational Astra Pt.	80,000
Krama Yudha Ratu Motor Pt.	60,000
Krama Yudha S.M.M. Pt.	50,000
Gaya Motor Pt.	45,000
Indo Mobil Utama Pt.	40,000
Garuak Motor Pt.	20,000
National Assembler Pt.	15,000
Udatin Pt.	12,000
Imer Motor Pt.	10,000
I.S.C. Pt.	10,000
Krama Yudha Kesuma Motor Pt.	10,000
Permorin Pt.	10,000
Prospect Motor Pt.	10,000
German Motor Manufacturing Pt.	8,000
Pantja Motor Pt.	7,500
I.S.M.A.C. Pt.	3,500
Alun Indah Pt.	1,500
Total	392,500

Source: Central Bureau of Statistics.

In terms of passenger car production, 29,357 units were accounted for by 15 assemblers in 1987. Of these companies, the assembler of the Honda brand, Prospect Motor Pt., produced the largest number of cars at 9,020 units. National Astra Motor came in second, followed by Indo Mobil Utama Pt. (See Table 28.)

Table 28
CAR PRODUCTION IN INDONESIA
1987
(in units)

Assembler	Vehicle Brand	Production
Prospect Motor Pt.	Honda	9,020
National Astra Motor Pt.	Daihatsu	1,607
	Toyota	3,954
Indo Mobil Utama Pt.	Suzuki	3,225
National Motor Pt.	Mazda	2,736
Toyota Astra Motor Pt.	Toyota	2,438
Star Motors Indonesia Pt.	Mercedes Benz	1,451
IRMC Pt.	Ford	1,329
Alun Pt.	Citroen	740
Krama Yudha Tiga Berlian Motor Pt.	Mitsubishi	726
Tjahja Sakti Motor Pt.	BMW	725
Multi France Pt.	Renault	1
	Peugeot	644
Nahana Nirawan Pt.	Nissan Datsun	255
Indauda Pt.	Holden	254
Central Sole Agency Pt.	Volvo	199
Garmak Motor Pt.	Opel	53
Total		29,357

Source: Central Bureau of Statistics

In 1987, a total of 17 assemblers produced various brands of commercial vehicles under five different categories. For Category I, the Daihatsu brand had the largest production at 35,722 units. Under Categories II and III, the Mitsubishi

brand and the Mercedes Benz brand led in production volume, respectively. Production of jeeps under Category IV was dominated by the Daihatsu brand while the Isuzu brand topped Nissan under Category V by a narrow margin. (See Table 29.)

Table 29
PRODUCTION OF COMMERCIAL VEHICLES IN INDONESIA
1987
(in units)

Assembler	Vehicle Brand	Production
Category I:		
National Astra M. Pt.	Daihatsu	35,722
Toyota Astra M. Pt.	Toyota	31,653
Indo Mobil Utama Pt.	Suzuki	25,074
Krama Yudha Tbm. Pt.	Mitsubishi	18,078
Pantja Motor Pt.	Isuzu	206
Alun Pt.	Citroen	200
Indauda Pt.	Holden	130
Garmak Motor Pt.	Chevrolet	86
Sub-total		111,149
Category II:		
Krama Yudha Tbm. Pt.	Mitsubishi	8,546
Toyota Astra M. Pt.	Toyota	2,066
National Astra M. Pt.	Daihatsu	348
Star Motors Ind. Pt.	Mercedes Benz	154
Pantja Motor Pt.	Isuzu	76
Sub-total		11,190
Category III:		
Star Motors Ind. Pt.	Mercedes Benz	1,762
National Motor Pt.	Hino	1,307
Krama Yudha Tbm. Pt.	Mitsubishi	941
United Imer M. Pt.	Nissan Diesel	444
Alun Pt.	Renault	222
Central S.A. Pt.	Volvo	40
Pantja Motor Pt.	Isuzu	6
Sub-total		4,722

Assembler	Vehicle Brand	Production
Category IV:		
National Astra Motor Pt.	Daihatsu	3,109
Garmak Motor Pt.	Chevrolet	351
Djakarta Motor Pt.	AMC	114
Star Motors Ind. Pt.	Mercedes Benz	104
Java Motor Pt.	Landrover	3
Sub-total		3,681
Category V:		
Pantja Motor Pt.	Isuzu	54
United Tractors Pt.	Nissan	42
Lima Satria Nirwana Pt.	Mercedes Benz	18
Sub-total		114
Total		130,856

Notes: Category I - Gross Vehicle Weight (GVW) below 2.5 tons.
Category II - GVW from 2.5 up to 9 tons.
Category III - GVW from 9 up to 24 tons.
Category IV - Jeeps.
Category V - GVW above 24 tons.

Source: Central Bureau of Statistics.

4.1.1.2 Historical Production of Motor Vehicles

Automotive vehicle sales was assumed to be indicative of automotive production since the latter is not available. As shown in Table 30, estimated sales of light commercial vehicles was high at 306,414 units in 1989.

Table 30
MOTOR VEHICLE SALES IN INDONESIA
BY TYPE OF VEHICLE
1989
(in units)

	1989 *
Motorcycles	n.a.
Cars	25,476
Light commercial vehicles	306,414
Trucks and buses	67,908
Total	399,798

* Annualized based on January to April 1989 actual figures.

n.a. - not available.

Source: Swasembada, July 1989.

4.1.1.3 Historical Volume of Vehicles Registered

Based on motor vehicle registrations, the number of motor vehicles in Indonesia increased at a compounded annual rate of eight per cent from 1986 to 1989. Motorcycles, followed by trucks and buses, outnumbered the other types of motor vehicles. (See Table 31.)

Table 31
MOTOR VEHICLE REGISTRATIONS IN INDONESIA
BY TYPE OF VEHICLE
1986-1989
(in units)

	1986	1987	1988	1989 *
Motorcycles	5,115,925	5,554,305	5,419,531	5,450,631
Cars	1,121,609	1,179,103	1,073,106	1,091,227
Light commercial vehicles	n.a.	n.a.	n.a.	n.a.
Trucks and buses	n.a.	1,257,072	1,278,312	1,317,377
Total	6,237,534	7,981,480	7,770,949	7,859,235

* As of March.

n.a. - not available.

Source: Central Bureau of Statistics.

4.1.1.4 Pertinent Regulations and Government Programs

Under the government's mandatory deletion program, the components/parts of locally assembled vehicles which should be sourced locally are listed in Annex K. Included are grommets and mud flaps.

Plans to include additional components/parts in the deletion program as indicated in Annex L have been finalized. Among the additional components are pedal pads.

4.1.2 Demand for Rubber Automotive Components

4.1.2.1 Historical Demand

Automotive Manufacturing Industry

The assumptions and method used in deriving the 1986 to 1989 demand for rubber automotive components by the automotive manufacturing industry of

Indonesia were the same as those employed in estimating the demand for the Malaysian market. The derived demand is shown in Table 32.

Table 32
DERIVED DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY OF INDONESIA
1989

Type of Product	1989 *
Load bearing mountings	2,398,788
Weatherstrips	2,296,968
Windshield wiper blades	799,596
Car mats	-
Mud flaps	1,599,192
Bumper stops	1,599,192
Grommets	4,235,616
Pedal pads	1,199,394
Rubber seals	5,869,590

* Based on annualized motor vehicle production volume. Includes demand for production of cars, light commercial vehicles, and trucks and buses only.

Sources of basic data: Swasembada, July 1989
Interviews.

Plastic, instead of rubber, car mats are used in Indonesia.

Replacement Market

The approach used in estimating the market size for replacements in Malaysia was also employed in estimating replacement demand in Indonesia, although the assumptions on percentage of remaining five- and ten-year old vehicles which were based on interviews, were different. (See Annex F.)

The replacement demand for rubber automotive components in Indonesia is shown in Table 33.

Table 33
1989 REPLACEMENT DEMAND FOR
RUBBER AUTOMOTIVE COMPONENTS
IN INDONESIA
(in pieces)

Rubber Automotive Component	Volume
Load bearing mountings	116,103
Weatherstrips	290,523
Windshield wiper blades	524,416
Car mats	-
Mud flaps	23,031
Bumper stops	minimal
Grommets	121,368
Pedal pads	1,214,259
Rubber seals	317,823

* Excludes replacement demand for light commercial vehicles.

Source of basic data: Central Bureau of Statistics.

Aggregate Demand

The combined 1989 demand for rubber automotive components by the automotive manufacturing industry and the replacement market in Indonesia is shown in Table 34.

Table 34
COMBINED 1989 AGGREGATE DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY AND THE REPLACEMENT MARKET OF INDONESIA
(in pieces)

Rubber Automotive Component	Volume
Load bearing mountings	2,514,891
Weatherstrips	2,587,491
Windshield wiper blades	1,324,012
Car mats	-
Mud flaps	1,622,223
Bumper stops	1,599,192
Grommets	4,356,984
Pedal pads	2,413,653
Rubber seals	6,187,413

Sources: Tables 32 and 33.

4.1.2.2 Demand Projections

Automotive Manufacturing Industry

The method used to project the demand of the automotive manufacturing industry of Indonesia for rubber automotive components was the same as that used for Malaysia. The projected volume of vehicles produced was multiplied by the average number of rubber components per vehicle for each

vehicle type, and then added for all types of vehicles. The projected growth of motor vehicle production was assumed to follow the projected growth of GDP of Indonesia. A four per cent GDP growth rate was assumed for the period 1990 to 2000 based on the same historical GDP growth rate estimated from 1978 to 1987.

The projected demand is shown in Table 35.

Replacement Market

The projected replacement demand for rubber automotive components in Indonesia from 1990 to 2000 was estimated using the same method used in estimating projected replacement demand in Malaysia. Projected replacement demand is shown in Table 36.

Aggregate Demand

The combined projected demand for rubber components by the automotive manufacturing industry and the replacement market in Indonesia is presented in Table 37.

Table 35
PROJECTED DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY OF INDONESIA
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	2,494,740	2,594,529	2,698,310	2,806,243	2,918,492	3,035,232	3,156,641	3,282,907	3,414,223	3,550,792	3,692,824
Weatherstrips	2,388,847	2,484,401	2,583,777	2,687,128	2,794,613	2,906,397	3,022,653	3,143,559	3,269,302	3,400,074	3,536,077
Windshield wiper blades	831,580	864,843	899,437	935,414	972,831	1,011,744	1,052,214	1,094,302	1,138,074	1,183,597	1,230,941
Mud flaps	1,663,160	1,729,686	1,798,874	1,870,828	1,945,662	2,023,488	2,104,428	2,188,605	2,276,149	2,367,195	2,461,883
Bumper stops	1,663,160	1,729,686	1,798,874	1,870,828	1,945,662	2,023,488	2,104,428	2,188,605	2,276,149	2,367,195	2,461,883
Grommets	4,405,041	4,581,242	4,764,492	4,955,072	5,153,274	5,359,405	5,573,782	5,796,733	6,028,602	6,269,746	6,520,536
Pedal pads	1,247,370	1,297,265	1,349,155	1,403,121	1,459,246	1,517,616	1,578,321	1,641,454	1,707,112	1,775,396	1,846,412
Rubber seals	6,104,374	6,348,549	6,602,490	6,866,590	7,141,254	7,426,904	7,723,980	8,032,939	8,354,257	8,688,427	9,035,964

Note: Includes demand for production of cars, light commercial vehicles, and trucks and buses only.

Sources of basic data: Swasembada, July 1989
Interviews.

Table 36
PROJECTED REPLACEMENT DEMAND FOR
RUBBER AUTOMOTIVE COMPONENTS OF INDONESIA
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	158,272	200,715	190,654	164,015	168,765	156,839	142,362	228,797	105,942	108,450	113,499
Weatherstrips	385,225	484,136	486,775	432,100	409,173	395,546	393,350	606,374	321,553	329,164	344,488
Windshield wiper blades	571,315	613,666	766,379	481,089	493,923	483,946	449,918	603,875	409,477	393,398	411,711
Mud flaps	35,060	42,601	36,327	29,199	35,497	30,636	22,529	40,177	12,330	12,622	13,210
Grommets	149,113	196,762	219,122	150,268	167,146	115,326	129,575	188,314	178,373	182,596	191,096
Pedal pads	1,119,786	1,355,666	1,712,762	1,368,099	1,436,266	1,298,825	1,310,638	1,586,184	1,535,940	1,475,626	1,544,320
Rubber seals	403,914	528,905	558,561	399,937	447,477	331,134	339,799	514,181	407,892	417,548	436,985

Source of basic data: Central Bureau of Statistics.

Table 37
COMBINED PROJECTED AGGREGATE DEMAND FOR
RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY
AND THE REPLACEMENT MARKET OF INDONESIA
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	2,653,012	2,795,244	2,888,965	2,970,258	3,087,258	3,192,071	3,299,004	3,511,704	3,520,166	3,659,242	3,806,323
Weatherstrips	2,774,071	2,968,537	3,070,551	3,119,227	3,203,785	3,301,943	3,416,003	3,749,933	3,590,854	3,729,238	3,880,564
Windshield wiper blades	1,402,895	1,478,509	1,665,816	1,416,503	1,466,754	1,495,690	1,502,132	1,698,178	1,547,552	1,576,995	1,642,653
Mud flaps	1,696,220	1,772,287	1,835,200	1,900,027	1,981,158	2,054,124	2,126,957	2,228,781	2,288,479	2,379,817	2,475,092
Bumper stops	1,663,160	1,729,686	1,798,874	1,870,828	1,945,662	2,023,488	2,104,428	2,188,605	2,276,149	2,367,195	2,461,883
Grommets	4,554,153	4,778,004	4,983,614	5,105,340	5,320,421	5,474,731	5,703,356	5,985,047	6,206,975	6,452,342	6,711,632
Pedal pads	2,367,156	2,652,931	3,061,917	2,771,221	2,895,512	2,816,441	2,888,959	3,227,638	3,243,052	3,251,022	3,390,732
Rubber seals	6,508,288	6,877,453	7,161,052	7,266,527	7,588,731	7,758,038	8,063,779	8,547,120	8,762,149	9,105,975	9,472,949

Sources: Tables 35 and 36.

4.1.3 Supply

4.1.3.1 Sources of Supply

The rubber automotive components used by the automotive assemblers and the replacement market in Indonesia are either sourced locally or imported from other countries. Table 38 below shows the source of each rubber automotive component used in utility vehicles and motorcycles. It was not indicated where rubber automotive components for passenger cars are sourced.

Table 38
SOURCE OF RUBBER AUTOMOTIVE COMPONENTS
IN INDONESIA BY TYPE

Component	Source
Load bearing mountings	Imported
Weatherstrips	Local
Windshield wiper blades	Imported
Car mats	*
Mud flaps	Local
Bumper stops	n.a.
Grommets	Local
Pedal pads and seals	Local

* Not used in vehicles.

n.a. - not available.

Source: Interviews.

Load bearing mountings and windshield wiper blades are usually imported while the other rubber automotive components are sourced locally. Plastic car mats are used instead of rubber car mats in Indonesia.

Imports

Imports of other articles of unhardened vulcanized rubber under which rubber automotive components are classified are shown in Table 39. Indonesia significantly lowered its import levels of these items from CIF US$39 million or 10 million kilograms in 1986 to CIF US$3 million or 629 thousand kilograms in 1988. This reflects an average annual decrease of 75 per cent and 72 per cent in terms of export volume and value, respectively, during the three-year period.

Table 39
IMPORTS OF OTHER ARTICLES OF
UNHARDENED VULCANIZED RUBBER OF INDONESIA
BY COUNTRY OF ORIGIN
1986-1988
(volume in kgs.; value in thousand US$ CIF)

	1986		1987		1988	
Country	Volume	Value	Volume	Value	Volume	Value
Japan	9,645,784	37,979	268,825	2,133	224,488	1,749
Taiwan	123,015	190	134,531	227	84,191	113
U.S.	39,804	480	73,312	249	79,828	412
West Germany	13,361	49	27,622	271	40,968	187
Singapore	80,657	151	59,732	321	39,787	115
Malaysia	6,500	24	825	1	38,903	78
Hong Kong	1,142	4	15,507	16	25,863	43
Australia	21,544	188	38,398	165	23,228	65
Netherlands	33	1	2,418	211	9,706	71
South Korea	65,556	129	20,650	66	8,832	13
Thailand	15,240	3	816	1	5,224	5
Philippines	293	3	2	*	3	*
Others	27,997	70	73,899	201	48,445	191
Total	10,040,926	39,271	716,537	3,862	629,466	3,042

* Less than US$1,000.

Source: Foreign Trade Statistics, Indonesia.

Japan remained the top supplier of other articles of unhardened vulcanized rubber of Indonesia although its export level to the country considerably decreased from 9.6 million kilograms in 1986 (CIF US$38 million) to only 224 thousand kilograms (CIF US$1.7 million) in 1988. The other major suppliers of rubber automotive components of Indonesia were Taiwan, the U.S., West Germany, and Singapore.

Exports

Exports of other articles of unhardened vulcanized rubber of Indonesia were significantly lower than the country's imports of the same. Nevertheless, exports increased from 2,467 kilograms in 1987 to 83,790 kilograms in 1988. Indonesia exported these items to Singapore, Saudi Arabia, and the United Arab Emirates in 1988. (See Table 40.)

Table 40
EXPORTS OF OTHER ARTICLES OF UNHARDENED VULCANIZED RUBBER OF INDONESIA
1987-1988
(volume in kgs.; value in thousand US$ FOB)

	1987		1988	
Country	Volume	Value	Volume	Value
Singapore	2,467	14	10,050	62
Saudi Arabia	-	-	11,860	52
U.A.E.	-	-	61,880	283
Total	2,467	14	83,790	397

Source: Foreign Trade Statistics, Indonesia.

4.1.3.2 Profile of Major Local Manufacturers

Inoue Rubber Corporation (IRC) is the major OEM supplier of rubber automotive components in Indonesia, supplying the Astra and Indo Mobil groups. It currently produces almost all the types of rubber automotive components except load bearing mountings and windshield wiper blades. The company caters solely to the automotive manufacturing industry. IRC sells rubber automotive components directly to automotive assemblers, mostly those who carry Japanese brands (except Mitsubishi).

The other smaller local manufacturers of rubber automotive components supply the replacement market which is less discriminating than the original equipment manufacturers in terms of product standards.

4.2 Philippines

4.2.1 Background on the Automotive Industry

4.2.1.1 Industry Structure

The Philippine automotive manufacturing industry is made up mainly of assemblers of foreign vehicle brands. These assemblers import CKD packs which they assemble locally, although certain parts are locally sourced to comply with the government's minimum local content requirement for motor vehicles.

The major motor vehicle assemblers in the Philippines are identified in Table 41 below. There are six major assemblers of motorcycles, three assemblers of cars, and at least 11 assemblers of commercial vehicles.

Table 41
MAJOR AUTOMOTIVE ASSEMBLERS IN THE PHILIPPINES

Motorcycles

- Honda Philippines, Inc.
- Kawasaki Motor Philippines, Inc.
- Norkis Trading Company, Inc.
- Porta Coeli Industrial Corp.
- Suzuki Philippines, Inc.
- Victoria Motors Corp.

Cars

- Philippine Automotive Manufacturing Corp.
- Pilipinas Nissan, Inc.
- Toyota Motor Philippines

Commercial Vehicles

- Aeolus Philippines Industrial Corp.
- Columbian Motors
- Commercial Motors
- Francisco Motors
- Isuzu Motors

Commercial Vehicles

Philippine Automotive Manufacturing Corp.
Pilipinas Hino
Pilipinas Nissan Inc.
Sterling Motors Corp.
Toyota Motor Philippines
Universal Motors

Sources: Philippine Automotive Federation
Motorcycle Development Program Participants Association.

4.2.1.2 Historical Production of Motor Vehicles

Automotive vehicle sales in the Philippines grew at an annual rate of 59 per cent from 1986 to 1989. Motorcycles registered the highest volume of sales, followed by cars. (See Table 42.)

Table 42
MOTOR VEHICLE SALES IN THE PHILIPPINES
BY TYPE OF VEHICLE
1986-1989
(in units)

	1986	1987	1988	1989 $
Motorcycles	13,468	17,008	24,188	42,418
Cars	3,640	5,543	11,038	24,502
Utility vehicles	347	1,957	1,415	408
Light commercial vehicles	106	207	6,875	2,668
Trucks and buses	258	579	1,484	1,702
Total	17,819	25,294	45,000	71,698

$ Annualized based on January to June 1989 actual figures.

Sources: Philippine Automotive Federation
Motorcycle Development Program Participants Association
Truck Manufacturers Association.

4.2.1.3 Historical Volume of Vehicles Registered

Based on motor vehicle registrations, the number of motor vehicles in Philippines increased at a compounded annual rate of six per cent from 1986 to 1989. (See Table 43.)

Table 43
MOTOR VEHICLE REGISTRATIONS IN THE PHILIPPINES
BY TYPE OF VEHICLE
1986-1989
(in units)

	1986	1987	1988	1989 *
Motorcycles	288,625	248,042	278,611	310,967
Cars	356,688	358,765	366,367	424,046
Utility vehicles/ light commercial vehicles	416,555	441,757	472,433	537,124
Trucks and buses	123,965	125,176	123,588	141,348
Total	1,185,833	1,173,740	1,246,999	1,413,485

* Actual breakdown by type of vehicle not available; breakdown assumed to be the same as the average proportion from 1986 to 1988.

Source: Land Transportation Office.

4.2.1.4 Pertinent Regulations and Government Programs

The Philippine government launched three related programs which seek to develop a viable automotive parts manufacturing industry and obtain reasonable consumer prices of motor vehicles. These are the car development program, commercial vehicle development program, and motorcycle development program. Only the participants in these programs are allowed to import completely knocked-down packs of motor vehicles and assemble them in the country. Registered participants comply with a

minimum vehicle local content which is prescribed by the Board of Investments (BOI). They also commit to support the manufacture of components/parts whose cumulative net local content percentage is at least nine per cent of the total net local content requirement under the program. Annex M provides a listing of the vehicle components and their respective net local content percentages.

Recently, there was a proposal to allow more participants to the car development program. Application for memberships, however, was frozen by the BOI as the proposal is still being reviewed.

4.2.2 Demand for Rubber Automotive Industry

4.2.2.1 Historical Demand

Automotive Manufacturing Industry

The same assumptions and method used in deriving the demand for rubber automotive components by the automotive manufacturing industry of Malaysia were used in estimating demand for the Philippine market. In the Philippines, however, only about 80 per cent of vehicles produced use mud flaps based on interviews with major vehicle manufacturers and dealers. The derived demand for rubber automotive components for vehicle production from 1986 to 1989 is shown in Table 44.

Table 44
DERIVED DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY OF THE PHILIPPINES
1986-1989
(in pieces)

Type of Product	1986	1987	1988	1989 *
Load bearing mountings	26,106	49,716	124,872	175,680
Weatherstrips	39,892	70,151	164,572	268,582
Windshield wiper blades	8,702	16,572	41,624	58,560
Car mats	15,254	26,086	46,982	98,824
Mud flaps	35,472	53,728	105,299	161,565
Bumper stops	17,404	33,144	83,248	117,120
Grommets	111,048	165,631	316,516	457,810
Pedal pads	39,989	58,874	110,812	172,676
Rubber seals	99,202	154,822	346,667	484,322

* Based on annualized motor vehicle production volume.

Sources of basic data: Philippine Automotive Federation
Motorcycle Development Program Participants Association
Truck Manufacturers Association
Interviews.

Replacement Market

The method used in deriving the replacement demand for rubber automotive components in Malaysia was also used in computing the estimated replacement demand in the Philippines. As indicated in Annex F, however, the assumptions on percentage of remaining five- and ten-year old vehicles in the Philippines (which were based on interviews) were different from those of Malaysia. Replacement demand in the Philippines in 1989 is presented in Table 45.

Table 45
1989 REPLACEMENT DEMAND FOR
RUBBER AUTOMOTIVE COMPONENTS
IN THE PHILIPPINES
(in pieces)

Rubber Automotive Component	Volume
Load bearing mountings	82,724
Weatherstrips	240,870
Windshield wiper blades	211,573
Car mats *	191,509
Mud flaps	13,973
Bumper stops	minimal
Grommets	41,376
Pedal pads	280,635
Rubber seals	114,731

* Includes demand for plastic car mats which could not be estimated separately from rubber car mats in the absence of data on degree of substitution.

Sources of basic data: Land Transportation Office
Interviews.

Aggregate Demand

The combined 1989 demand for rubber automotive components by the automotive manufacturing industry and the replacement market in the Philippines is presented in Table 46.

Table 46
COMBINED 1989 AGGREGATE DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY AND THE REPLACEMENT MARKET OF THE PHILIPPINES
(in pieces)

Rubber Automotive Component	Volume
Load bearing mountings	258,404
Weatherstrips	509,452
Windshield wiper blades	270,133
Car mats	290,333
Mud flaps	175,538
Bumper stops	117,120
Grommets	499,186
Pedal pads	453,311
Rubber seals	599,053

Sources: Tables 44 and 45.

4.2.2.2 Demand Projections

Automotive Manufacturing Industry

The same method employed in computing projected demand for rubber components by the Malaysian automotive industry was used to project demand for the Philippine industry. However, only a four per cent growth rate was used based on historical real GDP growth of the country from 1978 to 1987. Table 47 shows the projected demand by the automotive manufacturing industry of the Philippines.

Replacement Market

The projected replacement demand for rubber automotive components in the Philippines from 1990 to 2000 is shown in Table 48. The same approach used in computing replacement demand in Malaysia was employed for the Philippine market, although the assumptions on percentage of remaining five- and ten-year old cars were different.

Aggregate Demand

The combined projected demand for rubber automotive components by the automotive manufacturing industry and the replacement market in the Philippines is shown in Table 49.

Table 47
PROJECTED DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY
THE AUTOMOTIVE MANUFACTURING INDUSTRY OF THE PHILIPPINES
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	182,707	190,015	197,616	205,521	213,742	222,291	231,183	240,430	250,047	260,049	270,451
Weatherstrips	279,325	290,498	302,118	314,203	326,771	339,842	353,436	367,573	382,276	397,567	413,470
Windshield wiper blades	60,902	63,338	65,872	68,507	71,247	74,097	77,061	80,143	83,349	86,683	90,150
Car mats	102,777	106,888	111,164	115,610	120,235	125,044	130,046	135,247	140,657	146,284	152,135
Mud flaps	168,028	174,749	181,739	189,008	196,569	204,431	212,609	221,113	229,957	239,156	248,722
Bumper stops	121,805	126,677	131,744	137,014	142,494	148,194	154,122	160,287	166,698	173,366	180,301
Grommets	476,122	495,167	514,974	535,573	556,996	579,276	602,447	626,545	651,606	677,671	704,777
Pedal pads	179,583	186,766	194,237	202,006	210,087	218,490	227,230	236,319	245,772	255,603	265,827
Rubber seals	503,695	523,843	544,796	566,588	589,252	612,822	637,335	662,828	689,341	716,915	745,591

Sources of basic data: Philippine Automotive Federation
Motorcycle Development Program Participants Association
Truck Manufacturers Association
Interviews.

Table 48
PROJECTED REPLACEMENT DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS
IN THE PHILIPPINES
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	98,385	124,086	141,402	158,138	127,634	62,329	69,230	91,465	117,975	142,553	105,484
Weatherstrips	277,748	334,238	373,218	416,288	342,133	186,959	206,123	265,399	339,905	421,172	344,729
Windshield wiper blade	163,974	206,811	235,670	263,564	212,724	103,882	115,384	152,442	196,625	237,588	175,807
Car mats *	215,685	249,388	278,874	312,909	257,559	149,260	164,506	209,737	268,877	334,916	287,152
Mud flaps	18,095	25,502	30,886	34,984	26,846	9,341	10,720	15,534	20,614	22,694	10,548
Grommets	51,260	66,972	73,785	80,938	66,840	40,725	50,395	60,027	72,256	88,887	78,527
Pedal pads	222,697	284,143	312,308	343,270	284,417	172,122	207,809	250,421	304,810	377,259	332,081
Rubber seals	142,701	188,734	209,774	230,693	189,108	105,242	127,256	155,930	190,704	232,795	192,216

* Includes demand for plastic car mats which could not be estimated separately from rubber car mats in the absence of data on degree of substitution.

Sources of basic data: Land Transportation Office
Interviews.

Table 49
COMBINED PROJECTED AGGREGATE DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY AND THE REPLACEMENT MARKET OF THE PHILIPPINES
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	281,092	314,102	339,018	363,659	341,376	284,620	300,413	331,895	368,022	402,602	375,936
Weatherstrips	557,073	624,737	675,336	730,491	668,905	526,800	559,559	632,972	722,181	818,739	758,159
Windshield wiper blades	224,877	270,149	301,542	332,071	283,971	177,979	192,445	232,585	279,974	324,271	265,958
Car mats	318,462	356,276	390,037	428,519	377,794	274,304	294,552	344,985	409,535	481,200	439,287
Mud flaps	186,122	200,250	212,625	223,992	223,415	213,773	223,328	236,647	250,572	261,850	259,270
Bumper stops	121,805	126,677	131,744	137,014	142,494	148,194	154,122	160,287	166,698	173,366	180,301
Grommets	527,383	562,139	588,759	616,511	623,836	620,001	652,842	686,571	723,863	766,557	783,305
Pedal pads	402,280	470,909	506,545	545,276	494,504	390,612	435,039	486,740	550,582	632,862	597,907
Rubber seals	646,396	712,577	754,570	797,281	778,360	718,064	764,591	818,758	880,045	949,710	937,807

Sources: Tables 47 and 48.

4.2.3 Supply

4.2.3.1 Sources of Supply

As in the other ASEAN countries, the demand for rubber automotive components in the Philippines is satisfied by both local production and importation of these items.

Based on interviews, two major assemblers of motorcycles, Honda Phils., Inc. and Kawasaki Motor Phils., Inc., use entirely locally made rubber automotive components. On the other hand, certain car and commercial vehicle assemblers import some of the rubber automotive components from Japan. (See Table 50.)

Table 50
SOURCE OF RUBBER AUTOMOTIVE COMPONENTS
BY VEHICLE TYPE AND COMPONENT

Vehicle Type	Component	Assembler	Source
Motorcycles	Mud flaps	Honda Phils., Inc.	Local
	Grommets	Honda Phils., Inc.	Local
		Kawasaki Motor Phils., Inc.	Local
	Pedal pads	Honda Phils., Inc.	Local
		Kawasaki Motor Phils., Inc.	Local
	Rubber seals	Honda Phils., Inc.	Local
		Kawasaki Motor Phils., Inc.	Local
Cars	Load bearing mountings	Pilipinas Nissan, Inc.	Imported - Japan
		Toyota Motor Phils.	Imported - Japan
	Weatherstrips	Pilipinas Nissan, Inc.	Local
		Toyota Motor Phils.	Local
	Windshield wiper blades	Pilipinas Nissan, Inc.	Imported - Japan
		Toyota Motor Phils.	Imported - Japan
	Car mats	Pilipinas Nissan, Inc.	Local
		Toyota Motor Phils.	Local
	Mud flaps	Pilipinas Nissan, Inc.	Imported - Japan
		Toyota Motor Phils.	Local

Vehicle Type	Component	Assembler	Source
	Bumper stops	Pilipinas Nissan, Inc.	Imported - Japan
		Toyota Motor Phils.	Imported - Japan
	Grommets	Pilipinas Nissan, Inc.	Local
		Toyota Motor Phils.	Local
	Pedal pads	Pilipinas Nissan, Inc.	Local
		Toyota Motor Phils.	Local
	Rubber seals	Pilipinas Nissan, Inc.	Local
Commercial Vehicles	Load bearing mountings	Columbian Motors Corp.	Local
		Francisco Motors Corp.	Imported - Japan
		Masterbuilt Industries, Inc.	Imported - Japan
	Weatherstrips	Columbian Motors Corp.	Local
		Francisco Motors Corp.	Imported - Japan
		Masterbuilt Industries, Inc.	Local
	Windshield/ wiper blades	Columbian Motors Corp.	Local
		Francisco Motors Corp.	Imported - Japan
		Masterbuilt Industries, Inc.	Imported - Japan
	Car mats	Masterbuilt Industries, Inc.	Local
	Mud flaps	Columbian Motors Corp.	Local
		Francisco Motors Corp.	Imported - Japan
	Bumper stops	Francisco Motors Corp.	Local
		Masterbuilt Industries, Inc.	Imported - Japan
	Grommets	Columbian Motors Corp.	Local
		Francisco Motors Corp.	Imported - Japan
		Masterbuilt Industries, Inc.	Local
	Pedal pads	Columbian Motors Corp.	Local
		Francisco Motors Corp.	Local
		Masterbuilt Industries, Inc.	Local
	Rubber seals	Columbian Motors Corp.	Imported - Japan
		Masterbuilt Industries, Inc.	Local

Source: Interviews.

Load bearing mountings, windshield wiper blades, and bumper stops are mainly imported while car mats and pedal pads are usually locally sourced. The other rubber components are both imported and locally sourced.

4.2.3.2 Imports

Philippine imports of rubber automotive components by type are shown in Table 51. There is no available record of importations of load bearing mountings, which are mainly imported, and car mats.

Table 51
IMPORTS OF SELECTED RUBBER AUTOMOTIVE COMPONENTS
OF THE PHILIPPINES BY COUNTRY OF ORIGIN
1986-1988

Item	1986 Origin	1986 Quantity (in pcs.)	1986 Value (in US$)	1986 Basis of Value	1987 Origin	1987 Quantity (in pcs.)	1987 Value (in US$)	1987 Basis of Value	1988 Origin	1988 Quantity (in pcs.)	1988 Value (in US$)	1988 Basis of Value
Weatherstrips	Brazil	2,480	2,141.30	NCV	Brazil	240	81.60	CF	West Germany	35	5.25	s
	Japan	330	9,988.12	NCV	Japan	1,792	11,372.50	NCV	Japan	190	21,633.40	s
		40	39.40	CF		28	38.00	FOB		1,124	3,474.84	NCV
	Singapore	1,005	1,130.00	NCV		1,292	2,461.58	s				
	West Germany	142	631.33	s	London	76	359.65	CF				
		20	489.62	FOB								
					Singapore	16	3.84	s				
						40	2,282.80					
					South Korea a/	200	776.00	FOB				
					UK	10	40.00	CF				
						400	1,042.80	NCV				
						155	226.30	s				
					West Germany	40	456.60	s				
	Total	4,017			Total	4,089			Total	1,349		
Windshield wiper blades	China	4,000	2,880.00	CF	China	9,200	15,770.00	NCV	Brazil	380	109.00	s
		1,200	1,400.00	s		2,000	300.00	CF	China	1,300	234.00	NCV
		300	45.00	FOB		6,200	8,480.00	s		7,600	11,646.00	CIF
	Japan	1,160	884.06	NCV	Japan	120	27,755.26	NCV		2,200	290.00	CF
	a/	21,150	242,650.00	CF		65	75.50	FOB	a/	4,000	894.00	s
		22,560	890,145.00	CF		25,100	132,687.00	CF		3,000	3,300.00	s
		50	77.00	FOB		1,378	88,052.66	s	Japan a/	1,200	57,050.00	CF
		5,105	881.40	s	Singapore	440	110.00	s		4,902	224,006.00	CF
	Singapore	10,000	1,200.00	NCV	a/	10	3.00	NCV	a/	250	14,000.00	s
	USA	455	72.80	NCV		60	306.00	FOB		14,130	157,308.00	s
	West Germany	40	144.30	FOB	b/	135	783.00	CF		83	66.10	s
					c/	20	424.80	CF	South Korea	13,000	4,840.00	CF
					South Korea	7,600	2,553.00	NCV		12,200	3,789.00	s
						12,700	4,394.00	CF	USA	6,000	189,000.00	s
					USA	20,000	3,500.00	NCV				
						10,000	3,075.00	CF				
					West Germany	150	259.50	CF				
	Total	44,870			Total	95,013			Total	64,795		

Item	1986 Origin	1986 Quantity (in pcs.)	1986 Value (in US$)	1986 Basis of Value	1987 Origin	1987 Quantity (in pcs.)	1987 Value (in US$)	1987 Basis of Value	1988 Origin	1988 Quantity (in pcs.)	1988 Value (in US$)	1988 Basis of Value
Mudflaps					Japan	124	47,728.90	NCV	Japan a/	350	280.00	NCV
										9	648.74	NCV
										5	50.23	CF
										1	72.09	s
					Total	124			Total	15		
Bumper stops					UK	10	7.50	s	UK	20	73.46	s
					Japan	35	26.00	s	Singapore	8	64.00	CF
					Total	45			Total	28		
Grommets	Japan	160	10.26	NCV	China	18,750	9,018,375.00	FOB	Australia	100	12.02	NCV
		82,000	37,496.14	CIF	Japan	2,770	31.80	NCV	Brazil	10	13.40	NCV
		200	2,400.00	CF		2,800	12,000.00	FOB	Canada	400	12.00	s
	USA	2	2.04	s		3,500	s	s	Japan	49	53.35	NCV
		400	40,604.00	CF	USA	1,500	195.00	FOB		1,600	19,200.00	FOB
										19,196	13,551,223.36	s
	West Germany	10	55.50	FOB						3,300	s	s
	Total	82,772			Total	29,320			Total	24,655		
Pedal pads and seals					Japan	830	160.80	NCV	Japan	1,500	110.00	CF
						200	22.00	CF		3	1.44	NCV
						12	5.28	s		1,380	12,660.00	s
					Total	1,042			Total	2,883		

s Not indicated.

a/ in sets.

b/ in grams.

c/ in boxes.

Notes: Quantities in sets, grams, and boxes are not reflected in the totals.

Source: Business Statistics Monitor.

In 1988, the Philippines imported a large quantity of windshield wiper blades, 65 thousand pieces. Windshield wiper blades are supplied mainly by other countries as there is only one major manufacturer of this item in the Philippines.

About 25 thousand pieces of grommets were also imported in 1988. This represents about seven per cent of the total demand for grommets for automotive production during that year.

Imports of rubber automotive components, except for pedal pads and seals, decreased from 1986 to 1988. In particular, imports of grommets decreased the most at the rate of 45 per cent from 1986 to 1988. Imports of pedal pads and seals, on the other hand, went up to 2.9 thousand pieces in 1988 from the previous year's level of one thousand pieces. Imports of windshield wiper blades more than doubled in 1987 but declined in 1988.

Japan is the Philippine's major supplier of rubber automotive components. South Korea, the People's Republic of China, and the U.S. also export a large proportion of windshield wiper blades to the Philippines.

4.2.3.3 Exports

Local producers export rubber automotive components abroad, although the value of these exports is significantly lower than the value of the country's imports. Philippine exports of other articles of unhardened vulcanized rubber increased dramatically in 1987 and decreased slightly in 1988. The Philippines exported to only the U.S. in 1986. In 1988, it exported to four other countries. (See Table 52.)

Table 52
EXPORTS OF OTHER ARTICLES OF UNHARDENED VULCANIZED RUBBER
OF THE PHILIPPINES
1986-1988
(volume in kgs.; value in thousand US$ FOB)

Countries	1986		1987		1988	
	Volume	Value	Volume	Value	Volume	Value
U.S.	300	2	7,625	20	7,686	18
Netherlands	-	-	500	4	-	-
Italy	-	-	-	-	674	6
China	-	-	-	-	823	5
Korea	-	-	-	-	203	2
Hong Kong	-	-	340	1	589	3
Guam	-	-	198	1	-	-
Tonga Islands	-	-	1,425	3	-	-
Total	300	2	10,088	29	9,975	34

Source: Foreign Trade Statistics, Philippines.

4.2.3.4 Profile of Major Local Producers

There are several major manufacturers of rubber automotive components in the Philippines. There is, however, only one major producer of windshield wiper blades, Cavalier Marketing and Rubber Manufacturing. Table 53 below lists the major producers of each type of rubber automotive component.

Table 53
MAJOR PRODUCERS OF RUBBER AUTOMOTIVE COMPONENTS
IN THE PHILIPPINES

Component	Major Local Producers
Load bearing mountings	Sigma Rubber Products Manufacturing Ind. Corp. Crislin Rubber Products *
Weatherstrips	Transworld Rubber Industrial Manufacturing Corp. Latex Products Co., Inc. Cavalier Marketing & Rubber Manufacturing
Windshield wiper blades	Cavalier Marketing & Rubber Manufacturing
Car mats	Transworld Rubber Industrial Manufacturing Corp. Magna Rubber Manufacturing Corp. Crislin Rubber Products * Latex Products Co., Inc.
Mud flaps	Magna Rubber Manufacturing Corp. Crislin Rubber Products * Latex Products Co., Inc. Cavalier Marketing & Rubber Manufacturing
Bumper stops	Sigma Rubber Products Manufacturing Ind. Corp. Magna Rubber Manufacturing Corp. Crislin Rubber Products * Cavalier Marketing & Rubber Manufacturing

Component	Major Local Producers
Grommets	Sigma Rubber Products Manufacturing Ind. Corp. Magna Rubber Manufacturing Corp. Crislin Rubber Products * Cavalier Marketing & Rubber Manufacturing Greta Rubber Products
Pedal pads	Sigma Rubber Products Manufacturing Ind. Corp. Magna Rubber Manufacturing Corp. Crislin Rubber Products * Latex Products Co., Inc. Cavalier Marketing & Rubber Manufacturing

* Job order basis.

Source: Interviews.

Production and Production Capacity

Sigma Rubber Products Manufacturing Ind. Corp. is a manufacturer and exporter of rubber automotive parts of Isuzu, Hino, Nissan, Toyota, Chevy, and Ford vehicles. Its products include load bearing mountings, bumper stops, grommets, and pedal pads and seals. The company has an annual production of about 252 thousand load bearing mountings. Annual production capacity for the other components is shown in Table 54.

Table 54
PROFILE OF MAJOR PRODUCERS OF
RUBBER AUTOMOTIVE COMPONENTS IN THE PHILIPPINES

Name of Company	Type of Product	Annual Production Capacity (pcs.)
Signa Rubber Products Manufacturing Ind. Corp.	Load bearing mountings	252,000
	Bumper stops	42,000
	Grommets	21,000
	Pedal pads and seals	63,000
Transworld Rubber Industrial Manufacturing Corp.	Weatherstrips	720,000
	Car mats	600,000
Magna Rubber Manufacturing Corp.	Car mats	n.a.
	Mud flaps	n.a.
	Bumper stops	n.a.
	Grommets	5,728,320
	Pedal pads and seals	168,480
Latex Products Co. Inc.	Weatherstrips	n.a.
	Car mats	n.a.
	Mud flaps	n.a.
	Pedal pads and seals	n.a.
Cavalier Marketing & Rubber Manufacturing	Weatherstrips	46,800
	Windshield wiper blades	9,360
	Mud flaps *	9,360
	Bumper stops	9,360
	Grommets	124,800
	Pedal pads and seals	31,200
Crislin Rubber Products	Load bearing mountings *	n.a.
	Car mats *	n.a.
	Mud flaps	4,800
	Bumper stops	n.a.
	Grommets	12,000
	Pedal pads and seals	n.a.
Greta Rubber Products	Grommets	260,000

* Job order basis.

Source: Interviews.

Sales rather than production levels of Sigma Rubber Products Manufacturing Ind. Corp. were obtained. Sales volume was estimated at US$143 thousand in 1986, US$152 thousand in 1987, and US$169 thousand in 1988. However, sales significantly dropped to only US$29 thousand in 1989 due to labor problems that allowed the company to operate for only five months during the year.

Transworld Rubber Industrial Manufacturing Corp. manufactures weatherstrips. It has an annual capacity of 720 thousand pieces. The company also produces car mats and has the capacity to produce about 600 thousand pieces of this item a year. Sales was estimated at US$300 thousand annually. Transworld is a supplier of several original equipment manufacturers in the country like PAMCOR and Toyota.

Magna Rubber Manufacturing Corp. produces a wide range of rubber automotive components like car mats, mud flaps, bumper stops, grommets, and pedal pads and seals. Its annual production capacity is about 5.7 million pieces for grommets and 168 thousand pieces for pedal pads and seals. The company's annual sales was estimated at US$383 thousand. Nissan, Toyota, and PAMCOR are some of the direct buyers of rubber automotive components of Magna Rubber in the automotive assemblers market.

Latex Products Co. Inc. manufactures weatherstrips, car mats, mud flaps, and pedal pads and seals. Sales of weatherstrips was estimated at US$76 thousand in 1986, reaching US$151 thousand in 1989. Sales of weatherstrips accounts for 95 per cent of the company's total sales of rubber automotive components (which represents only 10 per cent of the total sales of the company).

Among the producers interviewed, Cavalier Marketing and Rubber Manufacturing is the only manufacturer of windshield wiper blades. Its annual production capacity for this item is nine thousand pieces. The company also produces weatherstrips, mud flaps, bumper stops, grommets, and pedal pads and seals. It supplies rubber automotive components to commercial vehicle assemblers like Francisco Motors Corp. and Masterbuilt Industries, Inc.

Crislin Rubber Products is another producer of load bearing mountings, car mats, mud flaps, bumper stops, grommets, and pedal pads and seals. It supplies mainly two car assemblers, Nissan and PAMCOR and one commercial vehicle assembler, Columbian Motors.

Greta Rubber Products manufactures only grommets and its production capacity is estimated at 260 thousand pieces a year.

Domestic Market Segments

Of the seven major manufacturers of rubber automotive components in the country, three serve only the local automotive industry while two companies cater solely to the replacement market. (See Table 55.)

Table 55
PERCENTAGE BREAKDOWN OF RUBBER AUTOMOTIVE COMPONENT SALES OF MANUFACTURERS IN THE PHILIPPINES BY MARKET SEGMENT

Name of Company	Type of Product	Percentage of Sales	
		Automotive Assemblers	Replacement Market
Sigma Rubber Products Manufacturing Ind. Corp.	Load bearing mountings Bumper stops Grommets Pedal pads and seals	10	90
Transworld Rubber Industrial Manufacturing Corp.	Weatherstrips Car mats	*	*
Magna Rubber Manufacturing Corp.	Car mats Mud flaps Bumper stops Grommets Pedal pads and seals	100	-
Latex Products Co. Inc.	Weatherstrips Car mats Mud flaps Pedal pads and seals	-	100
Cavalier Marketing & Rubber Manufacturing	Weatherstrips Windshield wiper blades Mud flaps Bumper stops Grommets Pedal pads and seals	100	-
Crislin Rubber Products	Load bearing mountings Car mats Mud flaps Bumper stops Grommets Pedal pads and seals	100	-
Greta Rubber Products	Grommets	-	100

* Cannot be quantified but manufacturer serves both markets.

Source: Interviews.

Level of Technology

Most of the manufacturers of rubber automotive components in the Philippines still employ conventional methods and equipment in their manufacturing process. Only Sigma Rubber Products Manufacturing Ind. Corp. claimed that it uses the latest technology provided by its supplier of raw material, Bayer Germany.

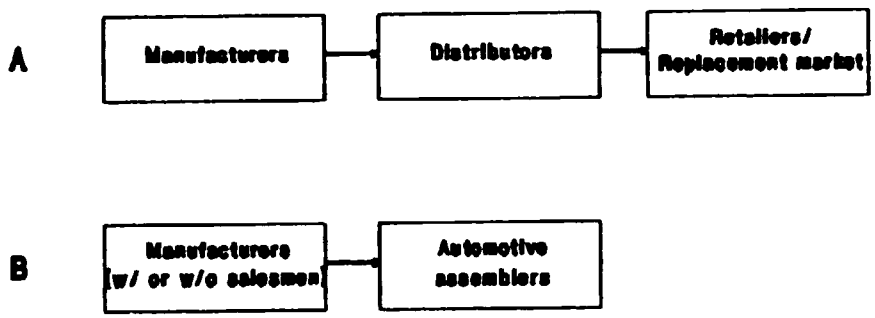
4.2.3.5 Distribution and Trade Practices

Channels of Distribution

There are two common channels through which rubber automotive components are distributed in the Philippines. One flow shows the supply of these items passing through distributors before reaching the retailers and the replacement market. Another channel shows the automotive assemblers and the retailers purchasing their supply of rubber automotive components directly from the manufacturers through the latter's salesmen. (See Figure 2.)

Imported rubber automotive components also pass through distributors before finally reaching the automotive assemblers, the retailers, and the replacement market.

Figure 2
MARKETING AND DISTRIBUTION NETWORKS
PHILIPPINES



Source: Interviews.

Prices

The following retail prices of rubber automotive components were indicated by selected local manufacturers:

Component	Retail Price range (in US$)
Load bearing mountings	0.55 - 6.80
Weatherstrips	3.10 - 16.40
Windshield wiper blades	0.45
Car mats	0.35 - 6.70
Mud flaps	0.65 - 2.25
Bumper stops	0.20 - 6.70
Grommets	0.05 - 0.65
Pedal pads	0.10 - 0.90

Source: Interviews.

4.2.3.6 Raw Materials

As shown in Table 56, three out of the seven manufacturers in the Philippines of rubber automotive components who were interviewed use 100 per cent natural rubber in their products. These companies are Latex Products Co. Inc., Cavalier Marketing and Rubber Manufacturing, and Greta Rubber Products. The other manufacturers use a mixture of synthetic and natural rubber, the percentage composition of which depends largely on the specifications of the customers.

Table 56
TYPE OF RUBBER USED BY MAJOR RUBBER AUTOMOTIVE COMPONENTS PRODUCERS IN THE PHILIPPINES

Name of Company	Type of Product	Percentage Composition	
		Natural Rubber	Synthetic Rubber
Signa Rubber Products Manufacturing Ind. Corp.	Load bearing mountings Bumper stops Grommets Pedal pads and seals	50	50
Transworld Rubber Industrial Manufacturing Corp.	Weatherstrips Car mats	*	*
Magna Rubber Manufacturing Corp.	Car mats Mud flaps Bumper stops Grommets Pedal pads and seals	60	40
Latex Products Co. Inc.	Weatherstrips Car mats Mud flaps Pedal pads and seals	100	-
Cavalier Marketing & Rubber Manufacturing	Weatherstrips Windshield wiper blades Mud flaps ** Bumper stops Grommets Pedal pads and seals	100	-

Name of Company	Type of Product	Percentage Composition	
		Natural Rubber	Synthetic Rubber
Crislin Rubber Products	Load bearing mountings **	60	40
	Car mats **		
	Mud flaps		
	Bumper stops		
	Grommets		
	Pedal pads and seals		
Greta Rubber Products	Grommets	100	-

* Cannot be quantified but the company uses a mixture of both natural and synthetic rubber.

** Job order basis.

Source: Interviews.

Table 57 shows the preference of selected vehicle assemblers with regard to the type of rubber used for rubber automotive components.

Table 57
TYPE OF RUBBER PREFERRED BY VEHICLE ASSEMBLERS IN THE PHILIPPINES

Company	Component	Raw Material
Kawasaki	Grommet	Synthetic rubber
	Pedal pad	Synthetic rubber
Toyota	Load bearing mountings	Natural rubber
	Weatherstrips	Synthetic rubber
	Windshield wiper blades	Synthetic rubber
	Car mats	Natural rubber
	Mud flaps	Natural rubber
	Bumper stops	Natural rubber
	Grommets	Natural and synthetic rubber
	Pedal pads	Natural rubber
Francisco Motors	Bumper stops	Natural rubber
	Pedal pads	Natural rubber
Columbian Motors	Load bearing mountings	Synthetic rubber
	Weatherstrips	Synthetic rubber

Source: Interviews.

4.3 Singapore

4.3.1 Background on the Automotive Industry

Except for buses, trucks, lorries, and other heavy vehicles, motor vehicles in Singapore are imported as completely built up units from countries like Japan, Italy, and France. For vehicles which are not imported in one piece, the engine, chassis, and cap are locally assembled. Data on vehicles assembled locally are not available.

4.3.1.1 Historical Volume of Vehicles Registered

Motor vehicle registrations in Singapore from 1986 to 1989 are shown in Table 58. The number of motor vehicles increased at a compounded annual rate of two per cent from 1986 to 1988. Cars, followed by motorcycles, comprised the bulk (more than 50%) of motor vehicle population in Singapore.

Table 58
MOTOR VEHICLE REGISTRATIONS IN SINGAPORE
BY TYPE OF VEHICLE
1986-1989
(in units)

	1986	1987	1988	1989 *
Motorcycles	120,387	116,544	117,570	119,302
Cars	234,557	236,120	251,414	263,540
Utility vehicles	n.a.	n.a.	n.a.	n.a.
Light commercial vehicles	105,643	104,938	108,477	111,141
Trucks and buses	13,072	13,522	14,347	14,619
Total	473,659	471,124	491,808	508,602

* As of June.

n.a. - not available.

Source: Registry of Vehicles.

4.3.1.2 Pertinent Regulations and Government Programs

Singapore will implement sometime in June a quota system for new vehicle purchases to curb motor vehicle growth. The quota system is expected to ensure a predictable motor vehicle growth rate and minimize traffic congestion. The details of the system are still being worked out but it will essentially require buyers to bid at monthly public tenders for a license to buy a new vehicle. Meanwhile, vehicle registration fees have been increased drastically as an interim measure to dampen the rush to buy new vehicles. When the quota system is implemented, the growth of replacement demand for rubber automotive components will slow down with a lower growth rate for vehicle registrations.

4.3.2 Demand for Rubber Automotive Components

4.3.2.1 Replacement Demand

Table 59 shows the replacement demand for rubber automotive components in Singapore in 1989. Replacement demand in Singapore was derived using the same method used for the Malaysian replacement market.

Table 59
1989 REPLACEMENT DEMAND FOR
RUBBER AUTOMOTIVE COMPONENTS
IN SINGAPORE

Rubber Automotive Component	Volume
Load bearing mountings	27,094
Weatherstrips	87,198
Windshield wiper blades	104,318
Car mats *	73,846
Mud flaps	3,133
Bumper stops	minimal
Grommets	9,997
Pedal pads	122,455
Rubber seals	28,574

* Includes demand for plastic car mats which could not be estimated separately from rubber car mats in the absence of data on degree of substitution.

Source of basic data: Registry of Vehicles
Interviews.

4.3.2.2 Projected Replacement Demand

The projected replacement demand for rubber automotive components of Singapore from 1990 to 2000 is shown in Table 60. This was derived using the assumption that total vehicle registrations will grow at an average of only one per cent a year due to efforts by the government to limit the number of vehicles in Singapore.

Table 60
PROJECTED REPLACEMENT DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS
IN SINGAPORE
1990-2000

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	39,589	32,851	42,134	41,767	32,271	19,913	11,308	16,868	34,502	34,847	35,196
Weatherstrips	135,553	110,586	145,230	143,537	108,695	66,371	38,642	58,450	120,857	122,066	123,286
Windshield wiper blade	102,532	75,353	100,819	132,000	116,797	96,830	83,126	93,035	123,074	124,305	125,548
Car mats *	116,551	94,504	124,938	123,250	93,104	56,208	32,994	50,119	104,121	105,162	106,214
Mud flaps	2,937	2,800	2,919	2,966	2,759	1,793	833	1,084	1,977	1,997	2,017
Grommets	13,739	12,603	15,665	15,581	12,634	7,876	4,472	6,130	11,141	11,252	11,365
Pedal pads	118,366	90,184	118,485	150,232	133,524	109,666	93,446	103,892	134,514	135,859	137,218
Rubber seals	39,061	35,120	43,597	43,431	34,917	21,988	12,348	17,225	32,196	32,518	32,843

* Includes demand for plastic car mats which could not be estimated separately from rubber car mats in the absence of data on degree of substitution.

Source of basic data: Registry of Vehicles
Interviews.

4.3.3 Supply

4.3.3.1 Sources of Supply

There is no local production of rubber automotive components in Singapore. Motor vehicle owners source replacement rubber automotive parts from Japan, France, and Italy through agents in Singapore. On the other hand, items used for local assembly of buses, trucks, lorries, tractors, and other heavy vehicles are included in the imported CKDs.

Imports of other articles of unhardened vulcanized rubber, under which rubber automotive components are classified, amounted to CIF US$248 million during the period January to September 1989. The major suppliers of these items include Japan, the U.S., the People's Republic of China, and Taiwan. (See Table 61.)

Table 61
IMPORTS OF OTHER ARTICLES OF UNHARDENED VULCANIZED RUBBER OF SINGAPORE BY COUNTRY OF ORIGIN
Jan.-Sept. 1989
(value in thousand US$ CIF)

Countries	Value
Japan	220,061
U.S.	9,034
PROC	4,225
Taiwan	3,592
West Germany	2,841
Malaysia	2,321
Thailand	787
Other countries	5,006
Total	247,867

Source: Foreign Trade Statistics, Singapore.

4.4 Thailand

4.4.1 Background on the Automotive Industry

4.4.1.1 Historical Production of Motor Vehicles

Automotive production in Thailand grew at an annual average rate of 44 per cent from 1986 to 1988. The figures exclude production data on motorcycles which are not available. Light commercial vehicles recorded a larger production volume than cars. (See Table 62.)

Table 62
MOTOR VEHICLE PRODUCTION IN THAILAND
BY TYPE OF VEHICLE
1986-1989
(in units)

	1986	1987	1988	1989 *
Motorcycles	n.a.	n.a.	n.a.	n.a.
Cars	21,046	29,333	54,549	59,966
Light commercial vehicles	47,803	60,069	85,436	104,356
Trucks and buses	5,313	8,746	14,288	19,454
Total	74,162	98,148	154,273	183,776

* Annualized based on January to June 1989 actual figures.

n.a. - not available.

Source: Department of Land Transport.

4.4.1.2 Volume of Vehicles Registered

Total vehicle registrations in Thailand as of September 1988 was estimated at about six million units.

4.4.2 Demand for Rubber Automotive Components

4.4.2.1 Historical Demand

Automotive Manufacturing Industry

The demand for rubber automotive components for automotive production in Thailand from 1986 to 1989 is shown in Table 63 below. This was derived using the same assumptions and method used in estimating demand by the Malaysian automotive manufacturing industry.

Table 63
DERIVED DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY OF THAILAND *
1986-1989
(in pieces)

Type of Product	1986	1987	1988	1989 **
Load bearing mountings	444,972	588,888	925,638	1,102,656
Weatherstrips	513,217	679,982	1,100,970	1,284,158
Windshield wiper blades	148,324	196,296	309,546	367,552
Car mats	84,184	117,332	218,196	239,864
Mud flaps	296,648	392,592	617,092	735,104
Bumper stops	296,648	392,592	617,092	735,104
Grommets	648,001	907,878	1,395,974	1,695,166
Pedal pads	222,486	294,444	462,819	551,328
Rubber seals	1,007,200	1,325,555	2,041,350	2,456,810

* Excludes demand for production of motorcycles.
** Based on annualized motor vehicle production.

Source of basic data: Department of Land Transport.

Replacement Market

The replacement demand market for rubber automotive components in Thailand is shown in Table 64. This was derived using the same method employed in estimating replacement demand in Malaysia. The assumptions on percentage of remaining five- and ten-year old vehicles, however, were assumed to be similar to those in the Philippine market. (See Annex F.)

Table 64
1989 REPLACEMENT DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS IN THAILAND

Rubber Automotive Component	Volume *
Load bearing mountings	216,973
Weatherstrips	361,572
Windshield wiper blades	911,172
Car mats **	27,664
Mud flaps	72,324
Bumper stops	minimal
Grommets	90,405
Pedal pads	911,172
Rubber seals	371,404

* Includes demand of commercial vehicles, trucks, and buses only.

** Includes demand for plastic car mats which could not be estimated separately from rubber car mats in the absence of data on degree of substitution.

Source of basic data: Department of Land Transport.

Aggregate Demand

The combined 1989 demand for rubber automotive components by the automotive manufacturing industry and the replacement market in Thailand is shown in Table 65.

Table 65
COMBINED 1989 AGGREGATE DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY AND THE REPLACEMENT MARKET OF THAILAND
(in pieces)

Rubber Automotive Component	Volume
Load bearing mountings	1,319,629
Weatherstrips	1,645,730
Windshield wiper blades	1,278,724
Car mats	267,528
Mud flaps	807,428
Bumper stops	735,104
Grommets	1,785,571
Pedal pads	1,462,500
Rubber seals	2,828,214

Sources: Tables 63 and 64.

4.4.2.2 Demand Projections

Automotive Manufacturing Industry

The projected demand for rubber automotive components by Thailand's automotive manufacturing industry from 1990 to 2000 was derived using the same method used for the Malaysian industry. For Thailand, it was assumed that automotive production will grow by five per cent from 1990 to 2000. (See Table 66.)

Replacement Market

The projected replacement demand for rubber automotive components in Thailand is shown in Table 67. The method used in the computation of the replacement demand in Malaysia was applied.

Aggregate Demand

The combined projected demand for rubber automotive components by the automotive manufacturing industry and the replacement market is shown in Table 68.

Table 66
PROJECTED DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY
THE AUTOMOTIVE MANUFACTURING INDUSTRY OF THAILAND
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	1,157,789	1,215,678	1,276,462	1,340,285	1,407,300	1,477,664	1,551,548	1,629,125	1,710,581	1,796,110	1,885,916
Weatherstrips	1,348,366	1,415,784	1,486,573	1,560,902	1,638,947	1,720,895	1,806,939	1,897,286	1,992,151	2,091,758	2,196,346
Windshield wiper blades	385,930	405,226	425,487	446,762	469,100	492,555	517,183	543,042	570,194	598,703	628,639
Car mats	251,857	264,450	277,673	291,556	306,134	321,441	337,513	354,388	372,108	390,713	410,249
Mud flaps	771,859	810,452	850,975	893,524	938,200	985,110	1,034,365	1,086,083	1,140,388	1,197,407	1,257,277
Bumper stops	771,859	810,452	850,975	893,524	938,200	985,110	1,034,365	1,086,083	1,140,388	1,197,407	1,257,277
Grommets	1,779,924	1,868,921	1,962,367	2,060,485	2,163,509	2,271,685	2,385,269	2,504,532	2,629,759	2,761,247	2,899,309
Pedal pads	578,894	607,839	638,231	670,143	703,650	738,832	775,774	814,563	855,291	898,055	942,958
Rubber seals	2,579,651	2,708,633	2,844,065	2,986,268	3,135,581	3,292,360	3,456,978	3,629,827	3,811,319	4,001,885	4,201,979

Note: Excludes demand for production of motorcycles.

Source of basic data: Department of Land Transport.

Table 67
PROJECTED REPLACEMENT DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS
IN THAILAND
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	235,586	258,500	274,281	281,502	296,757	315,886	322,027	340,253	364,463	384,895	1,087,241
Weatherstrips	392,589	430,774	457,072	469,105	494,527	526,404	536,638	567,010	607,361	641,403	1,811,819
Windshield wiper blades	977,617	1,027,180	1,087,233	1,144,102	1,207,363	985,733	1,110,552	1,284,102	1,503,348	1,760,929	1,812,069
Car mats *	30,037	32,959	34,971	35,892	37,837	40,275	41,058	43,382	46,487	49,074	138,623
Mud flaps	78,529	86,167	91,427	93,834	98,919	105,295	107,342	113,418	121,488	128,298	362,414
Grommets	98,161	107,708	114,284	117,293	123,649	131,619	134,178	141,772	151,860	160,373	453,017
Pedal pads	977,617	1,027,180	1,087,233	1,144,102	1,207,363	985,733	1,110,552	1,284,102	1,503,348	1,760,929	1,812,069
Rubber seals	403,264	442,488	469,501	481,861	507,974	540,718	551,229	582,428	623,865	658,844	1,861,085

* Includes demand for plastic car mats which could not be estimated separately from rubber car mats in the absence of data on degree of substitution.

Source of basic data: Department of Land Transport.

Table 68
COMBINED PROJECTED AGGREGATE DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS BY THE AUTOMOTIVE MANUFACTURING INDUSTRY AND THE REPLACEMENT MARKET OF THAILAND
1990-2000
(in pieces)

Rubber Automotive Component	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Load bearing mountings	1,393,375	1,474,178	1,550,743	1,621,787	1,704,057	1,793,550	1,873,575	1,969,378	2,075,045	2,181,005	2,973,157
Weatherstrips	1,740,955	1,846,559	1,943,646	2,030,008	2,133,474	2,247,299	2,343,577	2,464,296	2,599,512	2,733,161	4,008,165
Windshield wiper blades	1,363,547	1,432,406	1,512,721	1,590,864	1,676,463	1,478,288	1,627,735	1,827,144	2,073,541	2,359,633	2,440,707
Car mats	281,894	297,409	312,643	327,448	343,971	361,716	378,571	397,771	418,595	439,787	548,872
Mud flaps	850,388	896,619	942,402	987,358	1,037,119	1,090,405	1,141,707	1,199,501	1,261,875	1,325,705	1,619,691
Bumper stops	771,859	810,452	850,975	893,524	938,200	985,110	1,034,365	1,086,083	1,140,388	1,197,407	1,257,277
Grommets	1,878,085	1,976,629	2,076,650	2,177,777	2,287,158	2,403,304	2,519,447	2,646,304	2,781,619	2,921,620	3,352,326
Pedal pads	1,556,511	1,635,019	1,725,464	1,814,245	1,911,013	1,724,565	1,886,326	2,098,665	2,358,638	2,658,985	2,755,027
Rubber seals	2,982,914	3,151,121	3,313,565	3,468,129	3,643,555	3,833,078	4,008,208	4,212,255	4,435,183	4,660,728	6,063,064

Sources: Tables 66 and 67.

4.4.3 Supply

4.4.3.1 Sources of Supply

The demand for rubber automotive components in Thailand is mainly satisfied by local producers. About 85 to 90 per cent of the items used for automotive production are sourced locally while the remaining 10 to 15 per cent are imported from other countries.

Rubber automotive components used for replacement account for about 30 to 35 per cent of the total production of rubber automotive components.

4.4.3.2 Imports

Imports of other articles of unhardened vulcanized rubber of Thailand were recorded at CIF US$10.5 million or one thousand tons in 1988 from CIF US$6 million or 1.2 thousand tons in 1986. This reflects an eight per cent annual decrease in import volume while import value grew at an annual rate of 32 per cent during the same period. Japan and the U.S. are the major suppliers of other articles of unhardened vulcanized rubber of Thailand. (See Table 69.)

Table 69
IMPORTS OF OTHER ARTICLES OF UNHARDENED VULCANIZED RUBBER * OF THAILAND BY COUNTRY OF ORIGIN
1986-1988
(volume in tons; value in thousand US$ CIF)

Countries	1986		1987		1988	
	Volume	Value	Volume	Value	Volume	Value
Japan	961	2,752	383	5,775	476	5,590
U.S.	48	812	51	1,051	150	1,084
Singapore	9	139	17	201	145	498
Taiwan	38	122	185	754	62	434
West Germany	43	689	36	876	48	744
Other countries	97	1,498	266	2,066	133	2,194
Total	1,196	6,012	938	10,723	1,014	10,544

* Includes automotive, motorcycle, and trailer components excluding tires.

Source: Foreign Trade Statistics, Thailand.

4.4.3.3 Exports

Like the other ASEAN countries, Thailand's exports of rubber automotive components are exceeded by its imports. The country's exports of other articles of unhardened vulcanized rubber increased at a compounded annual rate of 420 per cent from 1986 to 1988. It exported to more than six countries in 1988.

Table 70
EXPORTS OF OTHER ARTICLES OF UNHARDENED VULCANIZED RUBBER *
OF THAILAND BY COUNTRY OF DESTINATION
1986-1988
(volume in tons; value in thousand US$ FOB)

Countries	1986		1987		1988	
	Volume	Value	Volume	Value	Volume	Value
U.S.	-	-	218	176	1,373	1,227
Singapore	28	89	150	371	370	1,279
Australia	1	1	3	6	222	632
Malaysia	11	31	42	95	157	513
United Kingdom	1	**	18	11	61	179
Others	53	91	38	91	359	1,106
Total	94	212	469	750	2,542	4,536

* Includes automotive, motorcycle, and trailer components excluding tires.

** Less than US$1,000.

Source: Foreign Trade Statistics, Thailand.

4.4.3.4 Profile of Major Local Producers

There are about seven major producers of rubber automotive components in Thailand. Table 71 shows the products manufactured by each company and production capacity.

Hui Hai Industry Co., Ltd. produces car mats and has an annual production capacity of 36 thousand pieces.

International Rubber Parts Co., Ltd. produces various types of rubber automotive components. Its annual production capacity is 40 tons for car mats, 30 tons for load bearing mountings, and 20 tons for mud flaps.

Table 71
PRODUCTION CAPACITY OF MAJOR PRODUCERS OF RUBBER AUTOMOTIVE COMPONENTS IN THAILAND
(in tons)

Name of Company	Type of Product	Annual Production Capacity
Hui Hai Industry Co., Ltd.	Car mats	36,000 pieces
International Rubber Parts Co., Ltd	Car mats	40
	Mud flaps	20
	Load bearing mountings	30
Pongpara Codan Rubber Co., Ltd.	Window weatherstrips	300
	Door weatherstrips	150
Siam Rubber Parts Co., Ltd.	Rubber products for industries	600,000 pieces
STP Rubber Co., Ltd.	Rubber parts for cars, motorcycles	240
World Rubber Co., Ltd.	Window weatherstrips	265
	Door weatherstrips	57
Yong Thai Rubber Industrial Co., Ltd.	Rubber parts for cars, motorcycles	300

Source: Interviews.

Pongpara Codan Rubber Co., Ltd. indicated an annual production capacity of 450 tons of weatherstrips which include window and door weatherstrips.

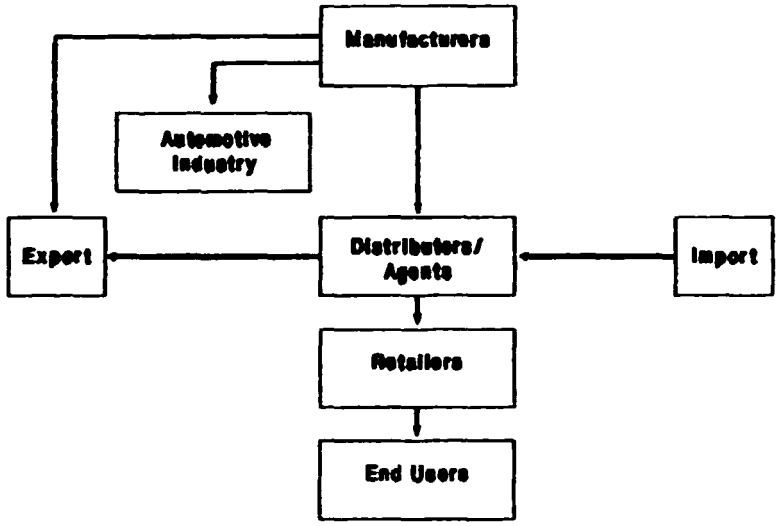
STP Rubber Co., Ltd. and Yong Thai Rubber Industrial Co., Ltd. registered an annual production capacity of 240 tons and 300 tons, respectively, of various rubber parts for cars and motorcycles.

World Rubber Co., Ltd. manufactures window and door weatherstrips and has an annual capacity of 265 tons for window weatherstrips and 57 tons for door weatherstrips.

4.4.3.5 Channels of Distribution

In Thailand, the supply of rubber automotive components passes from manufacturers to distributors or agents and then to retailers before finally reaching the end users in the replacement market. On the other hand, the automotive manufacturing industry purchases these items directly from the manufacturers. Imported items flow through the same channel of distribution as the locally made products. (See Figure 3.)

Figure 3
MARKETING AND DISTRIBUTION NETWORKS
THAILAND



Source: Interviews.

4.4.3.6 Raw Materials

The type of rubber used by Thai producers in the manufacture of rubber automotive components is shown in Table 72. Natural rubber is used in producing almost all components because of its abundance in Thailand, the country being the third biggest natural rubber-producing country in the world, next to Malaysia and Indonesia. Synthetic rubber is used in the manufacture of load bearing mountings and bumper stops to make items more durable.

Table 72
TYPE OF RUBBER USED FOR THE PRODUCTION
OF RUBBER AUTOMOTIVE COMPONENTS IN THAILAND

Component	Type of Rubber Used	Reasons Given by Manufacturers
Load bearing mountings	Synthetic rubber	Greater durability
Weatherstrips	Natural rubber	Abundance of raw material and low cost
Windshield/ wiper blades	Natural rubber	Abundance of raw material and low cost
Car mats	Natural rubber	Abundance of raw material and low cost
Mud flaps	Natural rubber	Abundance of raw material and low cost
Bumper stops	Synthetic rubber	Greater durability
Grommets	Natural rubber	Abundance of raw material and low cost
Pedal pads and seals	Natural rubber	Abundance of raw material and low cost

Source: Interviews.

4.5 Other Possible Markets Outside ASEAN

Other possible markets outside ASEAN for rubber automotive components include U.S.A., West Germany, and France. These countries registered the largest import value of unhardened rubber products in 1984. The product classification, however, is general and does not indicate the importation of rubber automotive components alone.

Table 73
TOP 5 COUNTRIES WHICH IMPORTED UNHARDENED RUBBER PRODUCTS
1984

Country	(in thousand US$)
U.S.A	263,181
West Germany	188,801
France	100,543
United Kingdom	87,860
Canada	73,588

Source: 1984 International Trade Statistics Yearbook.

Another major market is Japan which has already started to import automotive parts and accessories including those made of rubber from ASEAN countries.

5. CONCLUSION

Among the five ASEAN countries covered in the study, Indonesia had the highest total demand for rubber automotive components in 1989 at 22.6 million pieces. It was followed closely by Thailand and Malaysia, as shown below.

	Pieces				
Country	Automotive Manufacturing Industry	% of Total	Replacement Market	% of Total	Total
Indonesia	19,998,336	88	2,607,523	12	22,605,859
Thailand	9,167,742	76	2,962,686	24	12,130,428
Malaysia	7,884,840	79	2,048,804	21	9,933,444
Philippines	1,995,139	63	1,177,391	37	3,172,530
Singapore	-	-	456,615	100	456,615

Estimated demand for automotive assembly/production was highest in Indonesia at 20.0 million pieces, followed by Thailand. On the other hand, Thailand had the highest replacement demand (3.0 million pieces), followed closely by Indonesia (2.6 million pieces).

Except in Singapore and the Philippines, the demand for rubber automotive components by the automotive manufacturing industry accounted for more than two-thirds of the total rubber component demand. The OEM market in Indonesia accounted for about 88 per cent of the total rubber automotive component demand. In Malaysia, it accounted for 79 per cent and in Thailand, 76 per cent. In the Philippines, the OEM market accounted for slightly less than two-thirds of demand, 63 per cent.

Indonesia and Thailand will continue to be the top users of rubber automotive components based on total projected demand from 1990 to 2000. Estimated total demand for these products in Indonesia is expected to reach 23.6 million pieces in 1990, 28.1 million pieces in 1995, and 33.8 million pieces in 2000.

	Pieces				
Country	1990	1991	1992	1995	2000
Indonesia	23,618,958	25,052,652	26,465,989	28,116,526	33,841,829
Thailand	12,819,529	13,520,391	14,228,810	15,917,315	25,018,287
Malaysia	10,742,555	10,960,921	11,484,663	12,981,548	16,369,978
Philippines	3,265,489	3,637,815	3,900,177	3,354,347	4,597,969
Singapore	568,328	454,001	593,787	380,645	573,687

Among the different types of rubber automotive components, rubber seals, grommets, and weatherstrips registered the largest demand volume in terms of number of pieces. As shown below, the 1989 demand for rubber seals in Malaysia exceeded two million pieces while the combined demand of the four other ASEAN countries in the same year reached closely 10 million pieces. The 1989 demand for grommets was 1.9 million pieces in Malaysia and 6.6 million pieces in the other four countries.

	Malaysia			Other ASEAN Countries		
Rubber Automotive Component	Automotive Manufacturing Industry	Replacement Market	Total	Automotive Manufacturing Industry	Replacement Market	Total
Load bearing mountings	670,296	90,949	761,245	3,677,124	442,894	4,120,018
Weatherstrips	993,256	317,636	1,310,892	3,849,708	980,163	4,829,871
Windshield wiper blades	223,432	435,576	659,008	1,225,708	1,751,479	2,977,187
Car mats	322,960	273,640	596,600	338,688	293,019	631,707
Mud flaps	786,804	5,421	792,225	2,495,861	112,461	2,608,322
Bumper stops	446,864	*	446,864	2,451,416	*	2,451,416
Grommets	1,814,020	56,169	1,870,189	6,388,592	263,146	6,651,738
Pedal pads	675,088	730,901	1,405,989	1,923,398	2,528,521	4,451,919
Rubber seals	1,951,920	138,512	2,090,432	8,810,722	832,532	9,643,254
Total	7,884,640	2,048,804	9,933,444	31,161,217	7,204,215	38,385,432

Although the automotive manufacturing industry represents a larger market than the replacement market in all the ASEAN countries except Singapore, the local manufacturers of rubber automotive products in most of the countries already have existing tie-ups with the OEMS. In some cases, the OEMs also have existing arrangements with their own foreign suppliers for the supply of rubber components either not available locally or are available but are of substandard quality. It is therefore foreseen that there will be difficulties in penetrating the OEM market in the ASEAN countries.

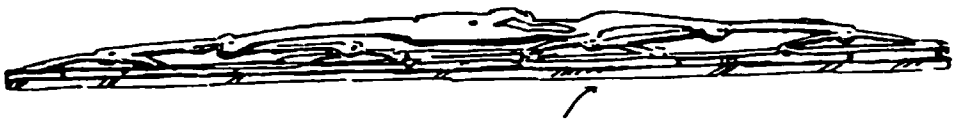
On the other hand, although smaller in size, the replacement market in these countries seems to offer better opportunities for market penetration. The countries that show opportunity in this area are Singapore, which has no producer of rubber automotive components, Indonesia, and the Philippines. There is, however, a proliferation of poor quality rubber components in the ASEAN markets. But, given the preferential tariff treatment, cheap raw materials, and economies of scale which the project will enjoy, the project may turn out to be price-competitive.

The project can also compete with the existing foreign suppliers of OEMs in the ASEAN countries, particularly for items like load bearing mountings, wiper blades, bumper stops, and weatherstrips. These items are largely imported in some of the countries. The project will have the advantages of lower tariff rates as well as local content accreditation which are not available to ordinary foreign suppliers.

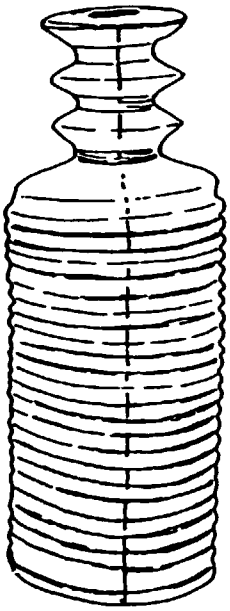
The project can establish a technical tie-up with one of the big Japanese manufacturers of rubber automotive components. Some of the candidates are Toyoda Gosei Co., which is affiliated with Toyota, Inoue MTP Co., Ltd., which is already in Indonesia and Thailand, Tokai Rubber Industries, and Kurashiki Kako Co. Aside from the benefit of acquiring technical know-how, a joint venture or technical licensing agreement might be a way to cut into the Japanese market on a long-term basis. In any case, the acquisition of the latest technology should provide the project with a competitive edge over most local producers in the ASEAN which still employ conventional manufacturing processes and do not have access to advanced technology.

ANNEXES

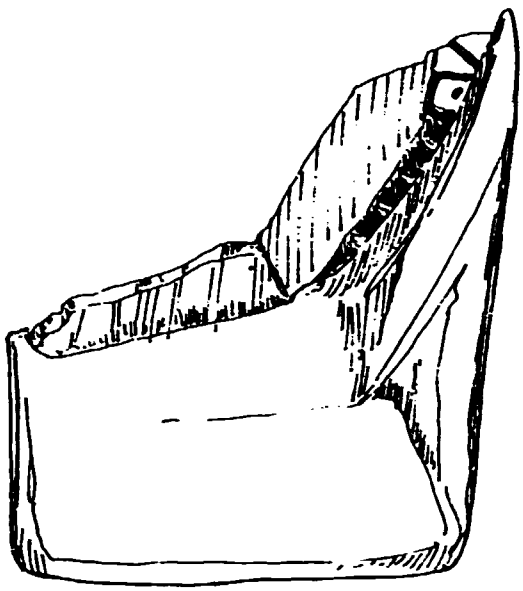
DRAWINGS OF RUBBER AUTOMOTIVE COMPONENTS



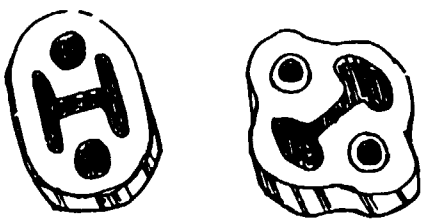
Wiper Blade



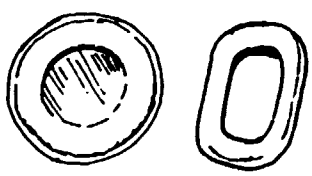
Bumper Stop



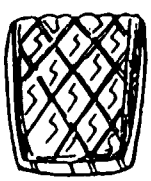
Mud Flap



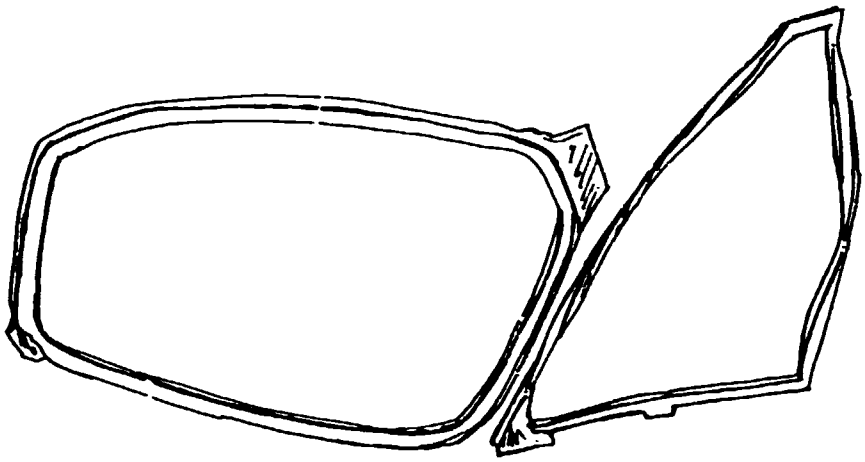
Load Bearing Mountings



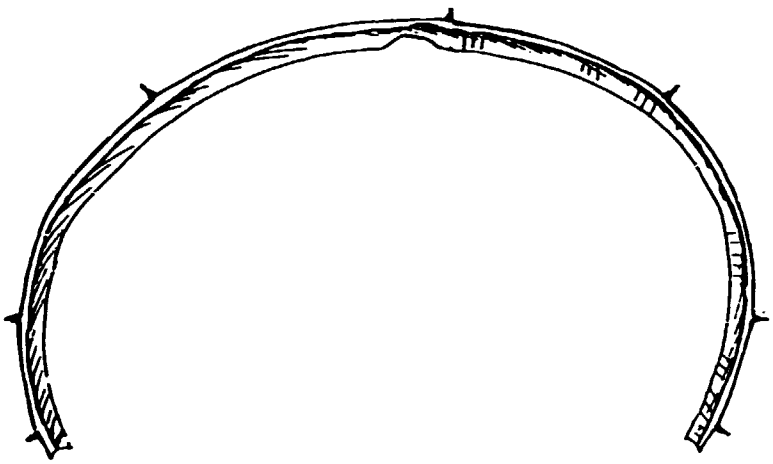
Grommets



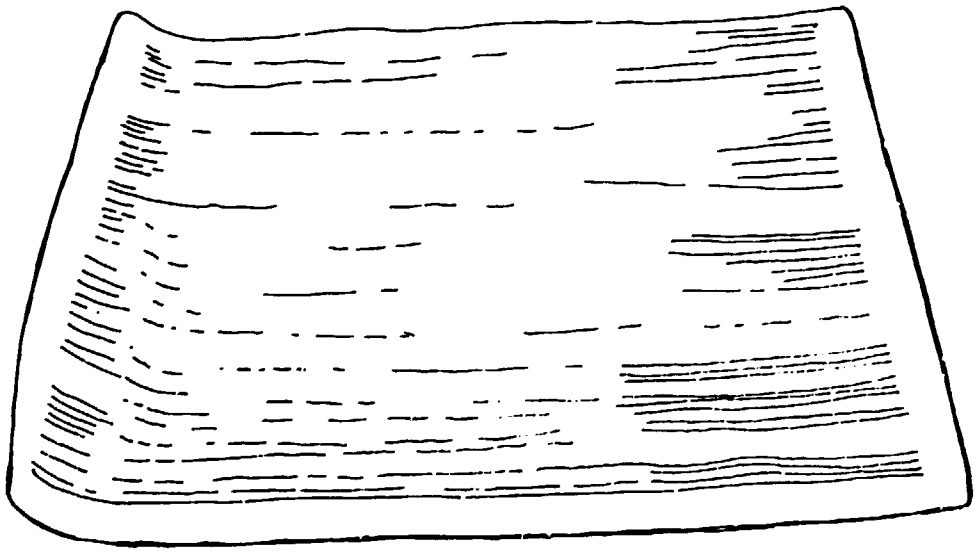
Pedal Pad



Weatherstrips

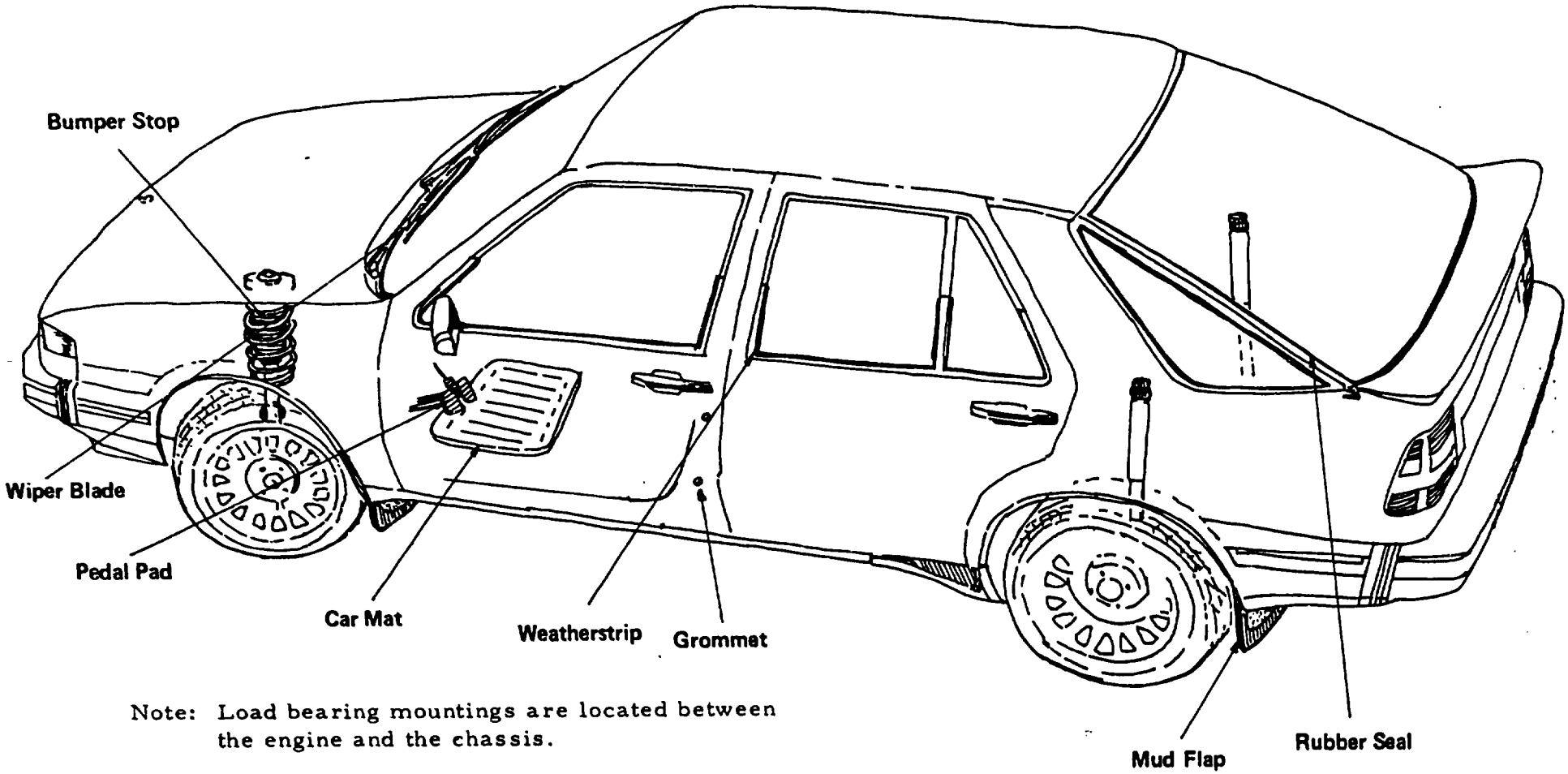


Rubber Seal



Car Mat

LOCATION OF RUBBER AUTOMOTIVE COMPONENTS IN A CAR



Note: Load bearing mountings are located between the engine and the chassis.

COMPONENTS/PARTS UNDER THE MALAYSIAN GOVERNMENT'S MANDATORY DELETION PROGRAM

1. tyres and tubes
2. battery
3. paints
4. mud flaps
5. safety seat belts
6. leaf springs (for commercial vehicles)
7. external side body protective mouldings
8. carpets and underlays
9. seat paddings
10. wiring harnesses
11. u-bolts, spring pins, shakle pin/bolts of leaf spring suspension systems (for commercial vehicles)
12. suspension shock absorbers (for commercial vehicles)
13. exhaust system
14. alternators, regulation, starter motor
15. air filter
16. shock absorbers
17. wiper motor
18. windshield wiper motors
19. radiator
20. electric horn
21. coil spring
22. fuel tank

COMPONENTS/PARTS UNDER NEGOTIATION FOR INCLUSION TO THE MALAYSIAN GOVERNMENT'S DELETION PROGRAM

1. seat assembly
2. melt damping sheet
3. flasher relay unit
4. screw jack
5. wheelnut and stud
6. brake/clutch/fuel tubings
7. air recover tank
8. air filter housing
9. disc pad
10. package tray/parcel shelf/spare wheel cover and board rear seat back (on voluntary deletion)
11. bolts and screws
12. tube valve and tubeless tyre valves
13. weather stif
14. emblem
15. control cables

FORMULAS USED TO DERIVE TOTAL DEMAND, DEMAND BY THE AUTOMOTIVE MANUFACTURING INDUSTRY, AND REPLACEMENT DEMAND FOR RUBBER AUTOMOTIVE COMPONENTS

Total Demand

Total demand for each rubber automotive component was derived using the following formula:

$$D_{TOTAL} = D_{ORIGINAL(O)} + D_{REPLACEMENT(R)}$$

where D_O = demand by the automotive manufacturing industry

D_R = demand by the replacement market

Demand by the Automotive Manufacturing Industry

Demand for each rubber automotive component by the automotive manufacturing industry was derived using the following formula:

$$D_O = (P_i \times C_i)$$

where P_i = production volume of vehicle type i

C_i = average number of rubber automotive component used in vehicle type i

Demand by the Replacement Market

Demand for each rubber automotive component by the replacement market was derived using the following formula:

$$D_R = (N_i \times P_i \times V_i \times C_i)$$

where N_i = volume of new registrations five and/or ten years ago

P_i = percentage of registered vehicles expected to remain on the road after five and/or ten years

V_i = estimated percentage of five- and ten-year old vehicles expected to replace a particular type of rubber automotive component

C_i = expected number of rubber automotive component that would need replacement

PERCENTAGE OF REGISTERED VEHICLES ASSUMED TO REMAIN ON THE ROAD AFTER FIVE AND TEN YEARS

Country	Vehicle Type	% Remaining on The Road After 5 years	% Remaining on The Road After 10 years
Malaysia & Singapore	Motorcycles	95	80
	Cars	95	90
	AUVs/LCVs	80	65
	Trucks/Buses	95	80
Thailand & Philippines	All types	100	90
Indonesia	All types	100	85

Note: Singapore market assumed to resemble Malaysian market while Thailand market assumed to be similar to Philippine market.

Source: Interviews in Malaysia, Philippines, and Indonesia.

NEW REGISTRATIONS IN ASEAN COUNTRIES
1979-1995

Malaysia

Vehicle Type	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Motorcycles	128,005	182,673	180,654	205,602	223,282	203,074	176,686	124,482	83,483	121,020	180,678	189,712	211,747	236,341	263,793	294,432	328,630
Cars	69,155	98,689	97,598	106,586	115,074	119,733	93,681	69,075	56,209	60,807	85,827	90,118	100,585	112,268	125,308	139,863	156,108
AUVs/LCVs	18,986	27,095	26,795	31,782	29,515	32,276	29,405	20,144	12,517	29,003	32,927	34,574	38,590	43,072	48,075	53,656	59,891
Trucks/Buses	1,513	2,159	2,135	2,656	2,227	2,558	2,081	1,396	1,134	713	758	846	944	1,054	1,176	1,313	1,466
Total	217,660	310,616	307,182	346,606	370,098	357,641	301,833	215,097	153,323	211,543	300,190	315,250	351,866	392,735	438,352	489,266	546,094

Note: New registrations from 1990 to 1995 were projected based on projected vehicle production and importations; the latter was assumed to follow the average ratio of imports to total production of about six is to one hundred.

Source: Statistics Department Annual Report.

Indonesia

Vehicle Type	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Motorcycles	316,970	364,763	491,308	601,158	371,235	420,418	238,422	324,390	435,395	571,481	584,988	612,221	584,988	612,221	640,721	584,988	612,221
Cars	43,089	57,933	71,482	80,073	74,921	61,054	63,657	73,308	106,144	67,600	69,200	72,422	69,200	72,422	75,793	69,200	72,422
AUVs/LCVs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Trucks/Buses	67,737	97,236	125,297	106,843	85,878	104,402	90,107	86,263	118,167	36,265	37,121	38,852	37,123	38,852	40,660	37,123	38,852
TOTAL	430,796	519,932	688,085	788,074	532,034	585,874	392,186	483,961	659,709	675,328	891,312	723,494	691,312	723,494	757,174	691,312	723,494

Note: New registrations from 1990 to 1995 were projected based on projected vehicle production and importations; the latter was assumed to follow the average ratio of imports to total production of about 4 imported vehicles for every one thousand locally produced vehicles.

n.a.- not available.

Source: Central Bureau of Statistics.

Philippines

Vehicle Type	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Motorcycles	50,773	46,397	47,313	51,342	55,608	23,366	16,985	34,750	30,430	29,659	50,664	52,972	81,150	70,592	81,491	94,074	108,599
Cars	37,781	31,290	35,645	33,292	31,111	12,722	8,589	7,571	10,657	16,322	27,797	20,858	24,078	27,796	32,087	37,042	42,761
AUVs/LCVs	30,832	25,193	35,072	38,548	38,075	17,810	11,869	13,826	23,144	33,543	34,437	8,953	8,026	9,265	10,696	12,347	14,254
Trucks/Buses	7,983	7,275	15,419	13,610	12,456	8,518	4,347	4,486	6,769	8,439	10,963	1,986	2,293	2,647	3,056	3,528	4,072
Total	127,369	110,155	133,449	137,192	137,250	60,216	41,570	60,633	71,000	87,963	123,861	82,768	95,548	110,300	127,330	146,990	169,686

Note: New registrations from 1991 to 1995 were projected based on projected vehicle production and importation; the latter was assumed to follow the average ratio of imports to total production of about 11 is to one hundred.

Source: Land Transportation Office.

Singapore

Vehicle Type	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Motorcycles	6,903	9,889	12,461	15,301	15,236	13,279	8,340	5,118	5,711	8,361	6,425	6,489	6,554	6,619	6,685	6,752	6,820
Cars	16,385	28,498	22,840	30,904	30,435	22,218	13,457	8,156	12,807	26,454	26,719	26,986	27,256	27,528	27,803	28,081	28,362
AUVs/LCVs	11,431	10,737	10,000	10,526	10,526	10,092	5,971	2,794	3,641	6,838	6,904	6,973	7,043	7,114	7,185	7,257	7,329
Trucks/Buses	502	454	625	570	716	421	752	334	430	625	631	638	644	650	657	663	670
Total	35,221	49,578	45,726	57,301	56,913	46,010	28,520	16,402	22,389	40,276	40,679	41,086	41,496	41,911	42,330	42,754	43,181

Note: New registrations from 1990 to 1995 were projected based on a projected growth rate of new registrations of one per cent a year.

Source: Registry of Vehicles.

Thailand

Vehicle Type	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Motorcycles	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Cars	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
LCVs	15,369	16,687	18,310	19,428	19,940	21,020	22,375	22,810	24,101	25,826	27,263	17,567	21,949	27,426	34,269	42,819	53,502
Trucks/Buses	185,532	201,448	221,042	234,536	240,710	253,755	270,112	275,363	290,948	311,640	329,121	212,062	264,971	331,081	413,666	516,901	645,867
Total	200,901	218,135	239,352	253,964	260,650	274,775	292,487	298,173	315,049	337,466	356,384	229,628	286,920	358,507	447,954	559,719	699,369

Notes: (1) Actual breakdown by type of vehicle from 1979 to 1989, except 1988 not available; breakdown for said years assumed to be the same as 1988 new registrations.
(2) New registrations from 1990 to 1995 were projected based on projected vehicle production and importations; the latter was assumed to follow the average ratio of imports to total production of about 119 is to one hundred.

n.a. - not available.

Source: Department of Land Transport.

PERCENTAGE OF FIVE- AND TEN-YEAR OLD VEHICLES
ASSUMED TO REPLACE RUBBER AUTOMOTIVE COMPONENTS

Rubber Automotive Component	Motor-cycles	Cars	AUVs/LCVs	Trucks/ Buses
Load bearing mountings	-	60	60	60
Weatherstrips	-	65	65	65
Windshield wiper blades	-	100	100	100
Car mats	-	100	100	-
Mud flaps *	0	0	10	10
Grommets	10	10	10	10
Pedal pads	100	100	100	100
Rubber seals	30	30	30	30

* Usually replaced in AUVs/LCVs, and trucks and buses only.

Notes: Bumper stops are assumed to be replaced only in certain accident cases.

This replacement pattern was assumed to hold in all five ASEAN countries.

Source: Interviews with vehicle repair shops in the Philippines.

AVERAGE NUMBER OF RUBBER AUTOMOTIVE COMPONENTS ASSUMED TO NEED REPLACEMENT AFTER FIVE AND TEN YEARS

Rubber Automotive Component	Motor-cycles	Cars	AUVs/LCVs	Trucks/ Buses
Load bearing mountings	-	2	2	2
Weatherstrips	-	7	4	3
Windshield wiper blades	-	2	2	2
Car mats	-	4	2	-
Mud flaps	0	0	4	4
Grommets	3	3	5	5
Pedal pads	1	2	2	2
Rubber seals	2	3	5	7

Note: This replacement pattern was assumed to hold in all five ASEAN countries.

Source: Interview with selected vehicle repair shops and owners of vehicles in the Philippines.

SAMPLE COMPUTATIONS FOR 1989 REPLACEMENT DEMAND

		Load bearing mountings	Windshield wiper blade
a.	Replacement rate	after 10 years	after 5 years
b.	1979 newly registered cars	69,155	69,155
c.	1984 newly registered cars	n.a.	119,733
d.	Percentage of vehicles expected to remain on the road after 10 years	90	90
e.	Percentage of vehicles expected to remain on the road after 5 years	n.a.	95
f.	Percentage of vehicles expected to replace component	60	60
g.	Expected number of component that would need replacement	2	2
h.	Replacement demand of load bearing mountings (b x d x f x g)	74,687	
i.	Replacement demand of windshield wiper blades [(b x d) + (c x e)] x f x g		211,183

n.a. - not applicable.

COMPONENTS/PARTS UNDER THE INDONESIAN GOVERNMENT'S MANDATORY DELETION PROGRAM

I.

No.	Component
1.	Wire harness
2.	Battery
3.	Brake Cable
4.	Throttle Cable
5.	Starter Cable/Choke Cable
6.	Clutch Cable/Wire Cable
7.	Front Fork/Steering Column
8.	Rear Absorber/Rear Cushion
9.	Tire & Tube
10.	Front Wheel
11.	Rear Wheel
12.	Hub (Rear & Front)
13.	Front & Rear Axle & Nut
14.	Centerstand/Mainstand
15.	Sidestand
16.	Front Footrest/Pillion Step Bar
17.	Rear Footrest/Pillion Step Bar
18.	Dual/Single/Double/Pillion Seat
19.	Ring Swing Arm/Rear Arm/Rear Fork
20.	Fuel Tank
21.	Frame Right Cover/Side Cover 1.2.3.4/Tool Box
22.	Frame Left Cover/Side Cover 1.2.3.4/Tool Box
23.	Handle/Handle Bar
24.	Chain Case
25.	Exhaust Pipe/Muffler
26.	Frame
27.	Front & Rear Fender
28.	Chain Adjuster
29.	Front & Rear Wheel Flange
30.	Oil Measuring Cup/Measuring Glass
31.	Fuel Filter
32.	Under Seat Cover
33.	Muffler Bracket
34.	Pillion Footrest Rubber/Rear Cover/Pillion Step Rubber
35.	Fuel Tank Seat Packing
36.	Front Engine Hamper
37.	Chassis Reinforcement
38.	Flap Packing
39.	Ridge for Engine Bonnet
40.	Beading for Engine Bonnet
41.	Air Filter

No.	Component
42.	Speedometer Cable
43.	Tachometer Cable
44.	Spooke & Nipple
45.	Front Fork & Side Cup
46.	Mirror
47.	Head Lamp/Head Light
48.	Stopper/Tail Lamp/Rear Comb. Lamp/ Tail Light Unit/Tail Light Brake
49.	Pilot Box Lamp/Winker/Indicator Lamp/Warning Lamp
50.	Flasher/Relay/Timer Switch
51.	Switches (Main Switch/Stop Lamp Switch)
52.	Ignition Coil
53.	Rectifier
54.	Horn
55.	Regulator
56.	Reflector
57.	Speedometer Assy
58.	Tachometer Assy
59.	Lock Assy
60.	Fuel TAnk Cap With Lock
61.	Under Bracket/Steering Stem
62.	Front & Rear Wheel Panel
63.	Brake Shoe & Brake Lining
64.	Non Critical Rubber Part (kecuali oil seal & bushing) - Grommet For Air Cleaner - Grommet For Wire Cleaner - Grommet For Air Cord - Buffer/Cushion - Center Stand Rubber/Stopper Pad - Cushion Seat Supporter - Hand Grip/Handle Grip R/L - Front Footrest Rubber/Footrest Cover/ Stop Rubber - Bellow For Carburator/Air Cleaner - Connecting Tube - Bellow For Rear Brake - Band Assy Battery Rubber
65.	Stickers
66.	Speedometer & Tachometer Holder
67.	Tail Lamp Bracket
68.	Seat Clamp
69.	Air Cleaner Cap
70.	Front Luggage Carrier Rod
71.	Frame Grip/Side Grip/Standing Handle
72.	Stripping Tapes/Graphic Set
73.	Upper Cover LH & RH/Handle Bar Cover/ Handle Comp/Head Lamp Housing/ Steering Handle Complete
74.	Fork Center Cover/Front Panel

No.	Component
75.	Steering Cap/Steering Dust Seat/ Steering Head Dust Seal/Ball Race Cover
76.	Simple Plastic Part: - Plastic Plug - Rear Fender Mudguard - Oil Tank
77.	Handle Under Cover/Handle Bar Housing Lower Part/Handle Lower Cover
78.	Engine Assembling
79.	Spark Plug/Busi

II.

No.	Component	Category
1.	Ban	I,II,III,IV
2.	Cat	I,II,III,IV
3.	Accu	I,II,III,IV
4.	Leaf Spring	I,II,III,IV
5.	Shock Absorber	I,II,III,IV
6.	Safety Glass	I,II,III,IV
7.	Radiator	I,II,III,IV
8.	Muffler & Tail Pipe	I,II,III,IV
9.	Plastic & Rubber Parts (Steel Insert)	I,II,III,IV
10.	Seat & Seat Frame	I,II,III,IV
11.	Wheel Rim	I,II,III,IV
12.	Cabin	I,II,III,IV
13.	Rear Body	I,II,III,IV
14.	Fuel Tank	I,II,III,IV
15.	Chassis Frame	I,II,III,IV
16.	Radiator Hose	I,II,III,IV
17.	Air Cleaner hose	I,II,III,IV
18.	Air Filter Element	I,II,III,IV
19.	Cable	I,II,III,IV
20.	Lable/Sticker/Name Plate	I,II,III,IV
21.	Grille	I,II,III,IV
22.	Wiring Harness	I,II,III,IV
23.	Brake Tube	I,II,IV
24.	Fuel Tube	I,II,III,IV
25.	Head Lining/Roof Insulator	I,II,III,IV
26.	Door Trim	I,II,III,IV
27.	Sun Visor	I,II,III,IV
28.	Mat Floor	I,II,III,IV
29.	Mud Guard	I,II,III,IV
30.	Grip Assist	I,II,III,IV
31.	Pull Handle	I,II,IV
32.	Bezel/Cover Door	I,II,IV
33.	Brake Drum	I
34.	Engine	I,II,III,IV
35.	Transmission	I,II,III,IV
36.	Axle	I,II,III,IV
37.	Propeller Shaft	I,II,III,IV
38.	Steering System	I,II,III,IV
39.	Clutch System	I,II,III,IV
40.	Brake System	I,II,III,IV

COMPONENTS/PARTS UNDER NEGOTIATION FOR INCLUSION TO THE INDONESIAN GOVERNMENT'S DELETION PROGRAM

I.

No.	Component	Schedule
	Engine Assy	
1.	Covers	1 October 1987
2.	Rubber Parts For Engine	1 October 1987
3.	Plastic Parts	1 October 1987
4.	Gasket	1 October 1987
5.	Bearings	1 October 1987
6.	Springs	1 October 1987
7.	Pedal Gear Chain	1 October 1987
8.	Cylinder Head	1 October 1988
9.	Cylinder Block	1 October 1988
10.	Piston	1 October 1988
11.	Kick Starter Pedal	1 October 1988
12.	Fly Wheel	1 October 1988
13.	Piston Ring	1 October 1988
14.	Fuel Cock	1 October 1988
15.	Oil Filter	1 October 1988
16.	Crank Case	1 October 1989
17.	Piston Pin	1 October 1989
18.	Crank Pin	1 October 1989
19.	Cylinder Sleeve	1 October 1989
20.	Cam Shaft	1 October 1989
21.	Cam Chain Tensioner	1 October 1989
22.	Crank Shaft	1 October 1990
23.	Connecting Rod	1 October 1990
24.	Kick Starter System	1 October 1990
25.	Valves Assy	1 October 1990
26.	Oil Pump	1 October 1990
	Transmission Assy	
27.	Drive Chain	1 October 1987
28.	Sprocket Rear	1 October 1987
29.	Sprocket (Drive)	1 October 1989
30.	Gear Change	1 October 1989
31.	Main Gears	1 October 1990
32.	Counter Gear (Spring Gear)	1 October 1990
33.	Main Shaft	1 October 1990
34.	Counter Shaft	1 October 1990
	Clutch Assy	
35.	Clutch	1 October 1990

No.	Component	Schedule
	Electrical	
36.	Contact Breaker	1 October 1989
37.	Spark Advancer	1 October 1989
38.	Electric Starter	1 October 1990
39.	Generator Assy	1 October 1990
40.	Magneto Coil	1 October 1990
	Brake System	
41.	Disc brake & Caliper	1 October 1990
	Frame Body	
42.	Emblem/Name Plate	1 October 1990

II.

No.	Component	Schedule	Category
	Engine Assy		
1.	Intake Manifold	1 January 1987	I, machining
2.	Exhaust Manifold	1 January 1987	I, machining
		1 January 1988	I, casting
3.	Cover, Cylinder Head	1 January 1987	I, machining
4.	Fan Belt	1 July 1987	I,II,III,IV
5.	Bearing Cap	1 January 1988	I, machining
6.	Cylinder Block	1 January 1988	I, machining
7.	Gasket cylinder head	1 January 1988	I,II,III,IV
8.	Motor Starter	1 January 1988	I,II,III,IV
9.	Alternator	1 January 1988	I,II,III,IV
10.	Cylinder Head	1 January 1989	I, machining
11.	Cam Shaft Holder	1 January 1989	I, machining
12.	Rocker Arm	1 January 1990	I, machining
13.	Connecting Rod	1 January 1990	I, machining
14.	Cam Shaft	1 January 1990	I, machining
15.	Crank Shaft	1 January 1990	I, machining
16.	Timing Pulley Gear	1 January 1990	I, machining
	Transmission Assy		
17.	Speedometer Gear	1 October 1987	I, machining
18.	Front Bearing Retainer	1 April 1988	I, machining
19.	Transmission Cover	1 April 1988	I, machining
20.	Transmission Case	1 April 1988	I, machining
21.	Extension Housing	1 April 1988	I, machining
22.	Clutch Housing	1 April 1988	I, machining
23.	Counter Gear Shaft	1 July 1988	I, machining
24.	Reverse Idler Gear Shaft	1 July 1988	I, machining
25.	Speed Shaft Rail/Fork	1 July 1988	I, machining
26.	Reverse Gear	1 July 1988	I, machining
27.	Reverse Idler Gear	1 July 1988	I, machining
28.	First Speed Gear	1 January 1990	I, machining
29.	Second Speed Gear	1 January 1990	I, machining
30.	1-2 Synchronizer Hub	1 January 1990	I, machining
31.	1-2 Synchronizer Sleeve	1 January 1990	I, machining
32.	Main Shaft (Output Shaft)	1 January 1990	I, machining
33.	Third Speed Gear	1 January 1990	I, machining
34.	3-4 Speed Synchronizer Hub	1 January 1990	I, machining
35.	3-4 Speed Synchronizer Sleeve	1 January 1990	I, machining
36.	Counter Gear	1 January 1990	I, machining
37.	Input Shaft Gear	1 January 1990	I, machining
38.	Synchronizer Ring (1-2)	1 January 1990	I, machining

No.	Component	Schedule	Category
	Clutch Assy		
39.	Torsion Spring	1 July 1987	I
40.	Strap	1 July 1987	I
41.	Pressure Plate	1 October 1987	I
42.	Disc Plate	1 January 1988	I
43.	Splined Hub	1 January 1988	I, machining
44.	Facing	1 January 1988	I
45.	Spring Seat	1 January 1988	I
46.	Stopper Pin	1 January 1988	I
47.	Friction Plate, Washer	1 January 1988	I
48.	Pivot/Wave Spring	1 January 1988	I
49.	Rivet	1 January 1988	I
50.	Cushion, Rubber	1 January 1988	I
51.	Cover	1 July 1988	I
	Electrical		
52.	Battery Cable		
	- Crimping	1 July 1987	
	- Die Casting	1 January 1988	
	Steering System		
53.	Tube Assy	1 October 1987	I
54.	Steering Wheel	1 October 1987	I
55.	Tie Rod Linkage	1 January 1988	I
56.	Knuckle Arm	1 January 1988	I, machining
57.	Pitman Arm	1 January 1988	I, machining
58.	Steering Shaft	1 January 1988	I, machining
59.	Steering Gear	1 July 1988	I, machining
60.	Tie Rod End	1 January 1989	I, machining
	Axle, Propeller Shaft		
61.	Side Bearing Nut	1 October 1987	I, machining
62.	Companion Flange	1 October 1987	I, machining
63.	Propeller Tube	1 October 1987	I, machining
64.	Pinion Shaft	1 July 1988	I, machining
65.	Rear Axle Shaft	1 July 1988	I, machining
66.	Rear Axle housing	1 September 1988	I, machining
67.	Differential Case	1 January 1989	I, machining
68.	Differential Carrier Case	1 January 1989	I, machining
69.	Differential Carrier Cap	1 January 1989	I, machining
70.	Tube Yoke	1 January 1989	I, machining
71.	Sleeve Yoke	1 January 1989	I, machining
72.	Flange Yoke	1 January 1989	I, machining
73.	Differential Side Gear	1 July 1990	I, machining
74.	Differential Pinion Gear	1 July 1990	I, machining
75.	Differential Drive Gear	1 July 1990	I, machining
76.	Differential Drive Pinion	1 July 1990	I, machining

No.	Component	Schedule	Category
	Suspension		
77.	Shock Absorber	1 July 1987	Strut type
	Brake System		
78.	Sleeve	1 July 1987	I
79.	Guide Pin	1 July 1987	I
80.	Support Caliper	1 July 1987	I
81.	Backing Plate	1 September 1987	I
82.	Cakram	1 January 1987	I
83.	Brake Lining	1 January 1988	I
84.	Brake Shoe	1 January 1988	I
85.	Disc Pad	1 January 1988	I
86.	Body Caliper	1 January 1988	I
87.	Cylinder Wheel	1 January 1989	I
88.	Piston	1 January 1989	I
89.	Brake Drum	1 July 1987	II,IV
	Frame Body		
90.	Jack	1 January 1988	Mechanic & Hydraulic
91.	Tools	1 January 1988	

COMMERCIAL VEHICLE DEVELOPMENT PROGRAM OF THE PHILIPPINES
NET LOCAL CONTENT PERCENTAGES
Effective January 1, 1988

CATEGORY I: AUV (UP TO 3 TONS GVW)

Components	Points	Local Content of Component, %	Net Local Content, %
Battery	1.05	0.8503	0.8928
Battery Cables	0.23	0.4017	0.0924
Body	10.50	0.7000	7.3500
Brake & Clutch Pedal Assy including hanger	0.35	0.8600	0.3010
Chassis	1.65	0.8000	1.3200
Diesel Engine *	30.00	0.3517	10.5510
Door Panels and Trim Cover Assy	1.20	0.0900	0.1080
Exhaust Assy	0.40	0.7000	0.2800
Flat Glass	0.35	0.7700	0.2695
Floor Mat	0.12	0.8000	0.0960
Front/Rear Axles *	8.75	0.1774	1.5523
Fuel Tank	0.28	0.6000	0.1680
Horn	0.05	0.7470	0.0374
Instrument Panel Gauges	1.00	0.4507	0.4507
Leaf/Coil Springs	1.64	0.5554	0.9109
All Lighting/Signalling Equipment	1.03	0.5300	0.5159
Pedal Pad	0.003	0.8000	0.0024
Propeller Shaft *	1.30	0.2253	0.2229
Radiator Assy	1.40	0.5932	0.8305
Radiator Hose	0.15	0.9000	0.1350
Rubber Bumper Axle	0.003	0.8000	0.0024
Shock Absorber	0.50	0.8000	0.4000
Soft Trims:	3.50	0.8000	2.8000
a. Seat Cover			
b. Seat Frame			
c. Seat Pad			
d. Seat Adjuster			

Components	Points	Local Content of Component, %	Net Local Content, %
Steering Wheel	0.30	0.8100	0.2430
Tires	5.00	0.7660	3.8300
Transmission *	7.00	0.8000	5.6000
Weatherstrip	0.10	0.8000	0.0800
Wheel Cup	0.0004	0.6000	0.0002
Wheel Rim	1.43	0.5610	0.8022
Wiring Harness	0.89	0.6970	0.6203
SUBTOTAL	80.1764		40.5647
	Local Content Requirement		32.4518
	Assembly Allowance		10.6500
		TOTAL	43.1018

NOTES:
1. "*" subject to availability on January 1, 1988.
2. Local content requirement from the list is 80%.

CATEGORY II: LCV (UP TO 3 TONS GVW)

Components	Points	Local Content of Component, %	Net Local Content, %
Armrest	0.04	0.8000	0.0390
Battery	0.74	0.8503	0.6299
Battery Cables	0.16	0.4017	0.0643
Brake, Clutch, Accelerator pedals	0.35	0.8600	0.3010
Diesel Engines *	27.60	0.3517	9.7069
Door Trim	0.05	0.8000	0.0400
Exhaust Assy	0.65	0.7000	0.4550
Flat Glass	0.35	0.7700	0.2695
Floor Mat	0.12	0.8000	0.0960
Front/Rear Axles *	7.21	0.1774	1.2791
Horn	0.14	0.5000	0.0700
Leaf/Coil Springs	3.12	0.5554	1.7328
Pedal Pad	0.003	0.8000	0.0024
Propeller Shaft *	1.23	0.2253	0.2791
Radiator Assy	1.37	0.5932	0.8127
Radiator Hose	0.05	0.9000	0.0450
Rubber Bumper Axle	0.003	0.8000	0.0024
Soft Trims	2.50	0.8000	2.0000
a. Seat Cover			
b. Seat Frame			
c. Seat Pad			
Shock Absorber	0.42	0.8000	0.3360
Tail/Stop/Brake/Signal and Back-up Lights	0.52	0.5500	0.2860
Tires	6.47	0.7660	4.9560
Transmissions	6.60	0.8000	5.2800
Weatherstrip	0.10	0.8000	0.0800
Wiring Harness	1.26	0.6970	0.8782
Wheel Cup	0.0004	0.6000	0.0002
Wheel Rim	1.31	0.5610	0.7349
SUBTOTAL	62.3664		30.3668
	Local Content Requirement		24.2934
	Assembly Allowance		11.3300
		TOTAL	35.6234

* Subject to availability on January 1, 1988
Local content requirement from shopping list is 80%.

CATEGORY III: TRUCKS (3.1 TO 6 TONS GVW)

Components	Points	Local Content of Component, %	Net Local Content, %
Battery	0.830	0.8000	0.6640
Brake, clutch, and accelerator pedals	0.250	0.8600	0.2150
Diesel engine *	21.710	0.3364	7.3133
Door Trim	0.130	1.0000	0.1300
Flat glass **	0.070	1.0000	0.0700
Horn	0.050	0.5500	0.0275
Leaf spring	2.270	0.5554	1.2608
Radiator assembly	1.160	0.6867	0.7966
Radiator hose	0.150	0.9000	0.1350
Soft trims	2.000	0.8000	1.6000
a. seat cover			
b. seat frame			
c. seat pad			
Tail/stop/brake/signal and back-up lights	0.047	0.5500	0.0259
Tires	5.680	0.7660	4.3509
Weatherstrips **	0.200	0.8000	0.1600
Wiring harness	1.050	0.6970	0.7319
SUBTOTAL	35.627		17.4809
	Local content requirement		13.9846
	Assembly Allowance		2.8500
		TOTAL	16.8346

NOTES:
1. "*" subject to availability in January 1, 1988; "**" whenever the part is applicable.
2. Local content requirement is 80% of the sub-total value.
3. "Points" are calculated from CKD prices of individual parts over the CKD Full Pack Price of the vehicle.
4. "Local Content of Components" are calculated from the individual selling prices of the components less imported materials and depreciation of imported equipment and other foreign costs.
5. "Net Local Content" = "Points" x " Local Content of Components"
6. Assembly Allowance represents other local materials and supplies used in the assembly of the vehicle, which is a percentage of total manufacturing cost.

CATEGORY IV: TRUCKS

A) 6.1 TO 9 TONS GVW

Components	Points	Local Content of Component, %	Net Local Content, %
Battery	0.9800	0.8000	0.7840
Battery Cables	0.1200	0.4000	0.0480
Diesel Engine *	21.7400	0.3700	8.0438
Horn (except Air Horn)	0.0500	0.5500	0.0275
Leaf Spring	2.8500	0.5000	1.4250
Radiator assembly	1.4800	0.6000	0.8880
Soft Trims:	2.0000	0.8000	1.6000
a. seat cover			
b. seat frame			
c. seat pad			
Tail/Stop/Brake/Signal and Back-up Lights	0.0470	0.6200	0.0291
Tires	5.7700	0.7000	4.0390
Wiring Harness	0.2600	0.7000	0.1820
SUBTOTAL	35.2970		17.0664
Local Content Requirement			13.6532
Assembly Allowance			2.8500
		TOTAL	16.50315

B) 9.1 TO 12 TONS GVW

Components	Points	Local Content of Component, %	Net Local Content, %
Battery	0.6000	0.8000	0.4800
Battery Cables	0.0700	0.4000	0.0280
Diesel Engine *	24.1500	0.3700	8.9355
Horn (except Air Horn)	0.0500	0.5000	0.0250
Leaf Spring	3.6000	0.5000	1.8000
Radiator assembly	1.3200	0.6000	0.7920
Soft Trims:	2.0000	0.8000	1.6000
a. seat cover			
b. seat frame			
c. seat pad			
Tail/Stop/Brake/Signal and Back-up Lights	0.0470	0.6200	0.0291
Tires	5.5900	0.7000	3.9130
Wiring Harness	0.2800	0.7000	0.1960
SUBTOTAL	37.7070		17.7986
Local Content Requirement			14.2389
Assembly Allowance			2.8500
		TOTAL	17.08891

CATEGORY IV: TRUCKS

C) 12.1 TO 15 TONS GVW

Components	Points	Local Content of Component, %	Net Local Content, %
Tires	6.5600	0.7000	4.5920
Battery	1.2000	0.8000	0.9600
Horn (except Air Horn)	0.0500	0.5000	0.0250
Leaf Spring *	3.6000	0.5000	1.8000
Radiator assembly	1.3200	0.6000	0.7920
Soft Trims:	2.0000	0.8000	1.6000
a. seat cover			
b. seat frame			
c. seat pad			
Tail/Stop/Brake/Signal and Back-up Lights	0.0500	0.6200	0.0310
SUBTOTAL	14.7800		9.8000
	Local Content Requirement		7.8400
	Assembly Allowance		2.8500
		TOTAL	10.69000

D) 15.1 TO 18 TONS GVW

Components	Points	Local Content of Component, %	Net Local Content, %
Tires	7.8800	0.7000	5.5160
Battery	0.3300	0.8000	0.2640
Horn (except Air Horn)	0.0500	0.5000	0.0250
Leaf Spring *	3.6000	0.5000	1.8000
Radiator assembly	1.3200	0.6000	0.7920
Soft Trims:	2.0000	0.8000	1.6000
a. seat cover			
b. seat frame			
c. seat pad			
Tail/Stop/Brake/Signal and Back-up Lights	0.0470	0.6200	0.0291
SUBTOTAL	15.2270		10.0261
	Local Content Requirement		8.0209
	Assembly Allowance		2.8500
		TOTAL	10.8709

NOTES:
1. "*" subject to availability in January 1, 1988; "**" whenever the part is applicable.
2. Local content requirement is 80% of the sub-total value.

3. "Points" are calculated from CKD prices of individual parts over the CKD Full Pack Price of the vehicle.
4. "Local Content of Components" are calculated from the individual selling prices of the components less imported materials and depreciation of imported equipment and other foreign costs.
5. "Net Local Content" = "Points" x " Local Content of Components"
6. Assembly Allowance represents other local materials and supplies used in the assembly of the vehicle, which is a percentage of total manufacturing cost.

CAR DEVELOPMENT PROGRAM OF THE PHILIPPINES
NET LOCAL CONTENT PERCENTAGE
Effective 01 January 1988

COMPONENT	POINTS, %	LOCAL CONTENT OF COMPONENTS, %	NET LOCAL CONTENT, %
Engine Components:			
Radiator Assembly	0.92	0.59	0.55
Radiator Hose Upper	0.04	0.90	0.04
Radiator Hose Lower	0.04	0.90	0.04
Radiator Clamp	0.01	0.90	0.01
Fan Shroud	0.19	0.70	0.13
Electrical Components:			
Battery	0.52	0.85	0.45
Battery Hold Down	0.01	0.90	0.01
Horn High	0.07	0.75	0.05
Horn Low	0.07	0.75	0.05
Tray, Battery	0.02	0.90	0.02
Holder Battery	0.01	0.90	0.01
Ignition Cord Set	0.10	0.21	0.02
Wiring Harness:			
Harness, Room Lamp	0.02	0.41	0.01
Harness, Engine	0.08	0.41	0.03
Harness, Engine Room	0.39	0.41	0.16
Harness, Front	1.29	0.41	0.33
Harness, Rear	0.30	0.41	0.13
Fusible Link	0.01	0.70	0.01
Battery Cable (+)	0.06	0.60	0.04
Battery Cable (-)	0.05	0.60	0.03
Exhaust System:			
Main Muffler	0.41	0.70	0.29
Front Exhaust Pipe	0.22	0.70	0.16
Center Exhaust Pipe	0.12	0.70	0.09
Bracket and Clamps	0.16	0.90	0.14
Fuel System:			
Fuel Pipes	0.13	0.70	0.09
Cap Assembly	0.05	0.70	0.04

COMPONENT	POINTS, %	LOCAL CONTENT OF COMPONENTS, %	NET LOCAL CONTENT, %
General Chassis Components:			
Wheel Discs	2.89	0.56	1.62
Tires	3.96	0.77	3.03
Valves	0.04	0.70	0.03
Clamp Spare Tire	0.02	0.90	0.02
Insulators	0.11	0.80	0.09
Floor Carpet	0.88	0.80	0.70
Door Trims:			
Front Door LH	0.26	0.90	0.24
Front Door RH	0.26	0.90	0.24
Rear Door LH	0.26	0.90	0.24
Rear Door RH	0.24	0.90	0.22
Ash Tray Assy RR Door	0.06	0.90	0.05
Arm Rest	0.11	0.80	0.09
Board Pin	0.06	0.80	0.05
Mat Trunk Room	0.23	0.80	0.19
Jack	0.25	0.70	0.18
Door Weatherstrips:			
Front Door LH	0.10	0.80	0.08
Front Door RH	0.10	0.80	0.08
Rear Door LH	0.10	0.80	0.08
Rear Door RH	0.10	0.80	0.08
Seat Frames:			
Front Cushion RH	0.14	0.80	0.11
Front Cushion LH	0.14	0.80	0.11
Back	0.29	0.80	0.23
Seat Adjuster:			
Left LH	0.09	0.90	0.08
Left RH	0.07	0.90	0.06
Right RH	0.07	0.90	0.06
Right LH	0.09	0.90	0.08
Seat Covers:			
FSB LH	0.32	0.94	0.30
FSB RH	0.32	0.94	0.30
FSC LH	0.25	0.94	0.23
FSC RH	0.25	0.94	0.23
RSB	0.48	0.94	0.45
RSC	0.39	0.94	0.36
Seat Pads:			
FSB LH	0.15	0.80	0.12
FSB RH	0.15	0.80	0.12
FSC LH	0.18	0.80	0.14
FSC RH	0.18	0.80	0.14
RSB	0.15	0.80	0.12

COMPONENT	POINTS, %	LOCAL CONTENT OF COMPONENTS, %	NET LOCAL CONTENT, %
RSC	0.44	0.80	0.35
Headrest Front	0.33	0.90	0.29
Glasses:			
Front Door LH	0.21	0.77	0.16
Front Door RH	0.17	0.77	0.13
Rear Door LH	0.13	0.77	0.10
Rear Door RH	0.13	0.77	0.10
Qtr Window LH	0.07	0.77	0.05
Qtr Window RH	0.07	0.77	0.05
Windshield	0.74	0.77	0.57
Back Window	0.51	0.77	0.40
Suspension:			
Front Coil/Leaf Soring	0.23	0.56	0.13
Rear Coil/Leaf Soring	0.28	0.56	0.15
Bumper, Rear Axle	0.06	0.80	0.05
Brake system:			
Disc Brake	0.27	0.70	0.19
Drum Brake	0.37	0.70	0.26
Brake Line:			
Brake Tubes	0.14	0.10	0.10
Brake Pedal	0.07	0.07	0.07
Clutch Pedal	0.04	0.04	0.04
Pedal Pad	0.01	0.01	0.01
Rod Hood Supt	0.02	0.02	0.02
Transmission	5.81	3.78	3.78
Condenser Tank Hose	0.02	0.01	0.01
Propeller Shaft*	1.30	0.29	0.29
Shock Absorber*	0.32	0.26	0.26
Turn Signal/Rear Comb. Lamps*	0.71	0.50	0.36
SUBTOTAL	31.50		21.59
		Local Content Requirement	17.27
		Assembly Allowance	15.00
		TOTAL	32.27

NOTES:

1. "*" subject to availability in January 1, 1988.
2. Local Content requirement from the list of parts = 80% of total
3. "Points" are calculated from CKD prices of individual parts over the CKD Full Pack Price of the vehicle.

4. "Local Content of Components" are calculated from the individual selling prices of the components less imported materials and depreciation of imported equipment and other foreign costs.
5. "Net Local Content" = "Points" x "Local Content of Components"
6. Assembly Allowance represents other local materials and supplies used inthe assembly of the vehicle, which is a percentage of total manufacturing cost.

MOTORCYCLE DEVELOPMENT PROGRAM OF THE PHILIPPINES
NET LOCAL CONTENT PERCENTAGE
Effective 01 January 1988

COMPONENT	POINTS, %	LOCAL CONTENT OF COMPONENTS, %	NET LOCAL CONTENT, %
FRAME COMPONENT PARTS:			
Body	6.70	64.13	4.2967
Stay, Muffler	0.16	97.92	0.1567
Engine Protector	0.20	98.33	0.1967
Reflectors	0.22	0.00	
Grip, Stand	0.19	98.25	0.1867
Rubber Parts	1.21	73.28	0.8867
Spring Tensions	0.07	90.48	0.0633
Collars	0.20	97.50	0.1950
Bushings	0.45	0.00	
Cable Clamps	0.10	90.00	0.0900
Battery Case	0.47	98.58	0.4633
Tool Case	0.47	93.62	0.4400
Swing Arm	2.10	83.65	1.7567
Rear Footrest Assembly	0.77	96.97	0.7467
Torque Link	0.14	97.62	0.1367
Chain Case Assembly	1.10	98.18	1.0800
Shaft, Swing Arm **	0.13	88.46	0.1150
Chain Adjuster	0.09	94.44	0.0850
Center Stand	0.80	99.17	0.7933
Side Stand	0.20	95.00	0.1900
Center Footrest	0.90	98.15	0.8833
Brake Pedal	0.35	98.10	0.3433
Brake Rod Assembly **	0.10	95.00	0.0950
Rear Cushion Assembly	2.40	9.79	0.2350
Handle Bar	0.68	87.25	0.5933
Grip, Left	0.15	56.67	0.0850
Grip, Right **	0.05	100.00	0.0500
Lever, Left & Right	0.25	0.00	
Lever Holder, Left & Right	0.84	0.00	
Mirror Assy., Left and Right **	0.57	55.26	0.3150
Handle Holder	0.29	68.97	0.2000

COMPONENT	POINTS, %	LOCAL CONTENT OF COMPONENTS, %	NET LOCAL CONTENT, %
FRONT CUSHION:			
Front Fork	6.08	0.00	
Steering Block	0.17	0.00	
Fork Cover Set **	0.95	100.00	0.9500
Steering Stem	1.00	0.00	
Head, Steering Stem	0.96	67.71	0.6500
Ball Races	0.29	0.00	
Front Fender	1.59	100.00	1.5900
Rear Fender **	1.10	100.00	1.1000
FRONT WHEEL:			
Front Tire Assy.	1.80	72.78	1.3100
Front Spoke Set	0.21	0.00	
Front Rim	0.60	0.00	
Front Hub	1.20	0.00	
Front Brake Panel Assy.	1.00	0.00	
Front Axle **	0.20	72.50	0.1450
REAR WHEEL:			
Rear Tire Assy.	2.00	73.33	1.4667
Rear Spoke Set	0.21	0.00	
Rear Rim	0.70	0.00	
Rear Hub	1.50	0.00	
Rear Brake Panel Assy.	1.00	0.00	
Rear Axle **	0.25	86.00	0.2150
Clutch Hub Assy.	0.50	0.00	
Rear Sprocket **	0.55	93.64	0.5150
Sleeve Sprocket	0.16	0.00	
FUEL/OIL TANK:			
Fuel Tank Assy.	2.90	68.85	1.9967
Graphics, Emblems, Stripes	1.90	54.47	1.0350
Oil Tank Assy.	1.00	70.00	0.7000
Side Cover Set	0.65	67.69	0.4400
Dual Seat Assy.	2.67	80.90	2.1600
Control Cables	0.75	0.00	
Meter Assy.	1.73	0.00	
Bracket Meter	0.20	97.50	0.1950
Ignition Switch Assy.	0.70	0.00	
Head Lamp Unit	0.76	0.00	
Head Lamp Housing Case **	0.70	95.71	0.6700
Tail Lamp **	1.20	85.00	1.0200
Bracket, License Plate **	0.50	97.00	0.4850
Turn Signal Lamp Set **	2.00	85.00	1.7000
Wire Harness	1.50	86.89	1.3033
Holder Fuse **	0.09	100.00	0.0900
Battery	1.02	86.60	0.8833
Horn	0.26	0.00	
Rectifier	0.20	0.00	
Ignition Coil	0.60	0.00	

COMPONENT	POINTS, %	LOCAL CONTENT OF COMPONENTS, %	NET LOCAL CONTENT, %
Flasher Relay Assy.	0.37	0.00	
Gear Change Pedal **	0.26	79.13	0.2058
Kick Starter Pedal	1.00	0.00	
Spark Plug Cap	0.13	0.00	
MUFFLER ASSY.:			
Exhaust Pipe	0.50	0.00	
Silencer	0.25	0.00	
Expansion Chamber	1.00	0.00	
Cover or Protector	0.25	0.00	
AIR FILTER ASSY.:			
Air Cleaner Case **	0.60	98.33	0.5900
Air Cleaner Cover **	0.20	95.00	0.1900
Air Cleaner Element	0.20	0.00	
Drive Chain	0.50	0.00	
Tool Set	0.64		
SUBTOTAL	73.60		36.2842
	Local Content Requirement		29.0273
	Assembly Allowance		15.0000
		TOTAL	44.0273

NOTES:

1. "*" subject to availability in January 1, 1988.
2. Local Content requirement from the list of parts = 80% of total
3. "Points" are calculated from CKD prices of individual parts over the CKD Full Pack Price of the vehicle.
4. "Local Content of Components" are calculated from the individual selling prices of the components less imported materials and depreciation of imported equipment and other foreign costs.
5. "Net Local Content" = "Points" x "Local Content of Components"
6. Assembly Allowance represents other local materials and supplies used inthe assembly of the vehicle, which is a percentage of total manufacturing cost.
7. "**" the content of these items are still subject to change.