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# JAPAN REPORT

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POLITICAL AND SOCIOLOGICAL

NEW LIBERAL CLUB'S TAGAWA VOICES CRITICISM OF TANAKA

Tokyo ZAIKAI in Japanese 23 March 82 pp 116-117

[Article by Ichiro Ushio: "The New Liberal Club's Savant Who Showed Manly Character in the 'Tanaka Criticism'"]

[Text] Tagawa Boom in the Political Arena

A small "Tagawa boom" is now occurring in the political arena. In an address delivered at the New Liberal Club fifth annual convention held in February, Mr Tagawa criticized by name former Prime Minister Tanaka, who, as leader of a large corps of 109 members, not only possesses the greatest influence on the Suzuki administration but also controls the LDP by having obtained the post of secretary general for his faction. "If a politician is convicted in the first instance in the Lockheed trial, it is only right for him to resign as a Diet member." Mr Tagawa has given Tanaka "advice to resign."

Mr Tagawa has said that "politics influenced by a defendant in a criminal case are not good" on various occasions such as party meetings, in speeches, or in press conferences with political reporters. However, this was the first time for him to make a criticism by specific name at an official party function such as the annual convention.

As the Tanaka corps has been expanding greatly and Tanaka's influence in the Suzuki administration has become more obvious, LDP factional leaders have been remaining silent with an eye toward "the next political power." Because Diet members are afraid of the power of former Prime Minister Tanaka and his faction, they are saying nothing about the Lockheed trial. This is the situation. Even Mr Takeo Miki and Mr Takeo Fukuda, who used to be the sharpest critics of plutocracy, say at the most: "One faction's expansion has reached an intolerable stage. If a faction becomes a party within the party, the party's order as a public party will be disturbed" (Mr Miki). Or, "Prime Minister Suzuki lacks eagerness for political reform" (Mr Fukuda). Their remarks are said to be "at most the howling of dogs" (an elder nonfaction member).

In the case of the opposition parties, as seen in the issue of the installation of fire control systems in F-4 Phantom fighters, the Komei Party has a close relationship with the Tanaka faction, while the Democratic Socialist Party has ties to the Fukuda faction and the Nakagawa group. For this reason, these two

parties have rarely criticized Tanaka. The Socialist Party also lacks an ambitious spirit. Therefore, Mr Tagawa's speech impressed many people. Both the offices of the New Liberal Club and Mr Tagawa have been receiving encouraging telephone calls from unknown citizens who say: "Mr Tagawa's opinion is right, and we hope he will maintain that attitude hereafter." There was also a secretary of an LDP Diet member who called on the telephone and said: "Thank you, Mr Tagawa, for saying this."

Mr Tagawa said: "At the start we were disappointed by the LDP's plutocratic tendency as represented by Mr Tanaka and we left the LDP to found a new party. I said what was only natural to us." Nevertheless, he has been surprised by such a big reaction. "It shows that the Tanaka issue is a cancer for politics in the immediate future and that dissatisfaction is deeply rooted in the present political arena and among people" (a leading member of the New Liberal Club).

#### Behind the Scenes of Tagawa's Speech

Mr Tagawa's speech, however, was not made merely to emphasize the founding spirit of the New Liberal Club or criticize the distorted situation in the political arena. For the leader of the New Liberal Club, a shrewd calculation can vaguely be seen.

In the 1979 general election, the New Liberal Club was miserably defeated and declined from 17 to 4 Diet seats. After the defeat, then President Yohei Kono's confrontation with then Secretary General Takeo Nishioka over the party line became apparent. As a result, Mr Nishioka left the party. Then, local assemblymen left the party one after another. Local level organizations of the New Liberal Club were dissolved one after another. The New Liberal Club found itself in a pinch for the first time since the foundation of the party.

Because of that, Mr Kono resigned from the presidency and Mr Tagawa became the president. Although the New Liberal Club obtained 10 seats in the House of Representatives and two seats in the House of Councilors in the 1980 double election of both houses and regained some of its force, it still lacks the strength it had at the time of its foundation. While Mr Yohei Kono is still said to be "equal to the New Liberal Club," Mr Tagawa has industriously been visiting local members or trying to meet and communicate with young Diet members of the New Liberal Club. By doing so, he has somehow maintained the unity of the party.

However, there were still differences between Mr Kono (currently the deputy president) and Secretary General Toshio Yamaguchi as to whether the New Liberal Club should join the middle-of-the-road parties or remain a second conservative party. At the annual convention held in February the New Liberal Club presented the idea of "a Liberal National League" intended to converge the middle-of-the-road parties and the liberal faction of the LDP, and it definitely decided to depart from the idea of two conservative parties. There were still some members in the party who strongly insisted on the two conservative party idea which involved continued ties with the LDP, but Mr Tagawa persuaded them and decided to change the party line greatly.

Therefore, Mr Tagawa needed to expose the current condition of the LDP under the tight control of the Tanaka faction in order to split with the LDP.

Another reason is to establish leadership of the New Liberal Club among the middle-of-the-road forces. Of the middle-of-the-road Komei Party, Democratic Socialist Party, New Liberal Club, and Socialist Democratic League, the New Liberal Club is the third largest. At the time of the extraordinary Diet session held last fall, the New Liberal Club and the Socialist Democratic League founded a joint organ called the New Liberal Club Democratic League in the Diet. The reason for this was to bring their forces as close as possible to those of the Komei and Democratic Socialist Parties.

Mr Tagawa pointed out the weakness of both the Komei and Democratic Socialist Parties, which would not take any action concerning the Tanaka issue because of their ties with LDP factions, and impressed the significance of the New Liberal Club's existence on people both inside and outside the party by criticizing plutocracy. This will weigh heavily in the convergence of the middle-of-the-road parties hereafter. Criticizing plutocracy is not against the founding spirit of the New Liberal Club. Consequently, this can lead to a tie with a force that is critical to plutocracy within the LDP. For this reason, some are saying: "Mr Tagawa has become suitable to be the leader of the party. Today his maneuvers are wonderful."

#### Holds Key to Convergence of the Middle-of-the-Road Forces

Mr Tagawa has had a long career in the Diet. If he had stayed in the LDP, he would have held a cabinet post. When he was an LDP member, he worked hard to improve the Japan-China relationship before the normalization of diplomatic relations between the two countries in spite of severe criticism within the party. Even today, he is one of the Japanese politicians in whom Chinese Government leaders have the most confidence. However, Mr Tagawa has a quiet nature, and because of this he has been said to be unsuitable to be the party boss.

Mr Tagawa himself has repeatedly said that "the face of the New Liberal Club is still Yohei Kono." During the annual convention, there was speculation that Mr Tagawa would pass the position as party leader to Mr Kono.

However, his skilfulness in keeping the party united during 2 difficult years is highly regarded by young members. He has shown characteristics different from Mr Kono, who has always been a star walking down a sunny road.

Among the middle-of-the-road parties, people are saying that "he may become a leader of the convergence of the middle-of-the-road forces in the future." At present, Tagawa's stock is rising sharply.

When he changes his old attitude his old attitude of "going my way" without stepping into the limelight and has the spirit of positively involving himself in reorganizing the middle-of-the-road forces, he will be a man who holds a key to the convergence of the middle-of-the-road forces.

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## POLITICAL AND SOCIOLOGICAL

### DISAFFECTION OF NON-MAINSTREAM FACTION IN LDP EXAMINED

Tokyo KEIZAI TEMBO in Japanese 1 Apr 82 pp 14-17

[Text] The FY-82 budget was finally passed in the House of Representatives after many difficulties. During the budget debates, the confusion shown by the Suzuki administration was unbearable to watch. The view that Suzuki's reelection is hopeless has already spread inside and outside the LDP. In addition, former Prime Minister Miki, who had kept silent for a long time, sharply criticized the Suzuki-Tanaka regime at a meeting of the LDP's supreme counselors. Then, former Prime Minister Fukuda joined Miki. A shaking of the Suzuki administration from inside the LDP has been realized.

Former Prime Minister Miki is a strategist shrewd enough that it can be said that the start of a political change is always initiated by him. His speech has had an uncanny impact within the party. Some declare that "a dormant volcano has erupted. It certainly spread to the Fukuda, Komoto, and Nakagawa factions to cause a great earthquake disaster." It seems that Suzuki's reelection in November is very delicate. Some people whisper the theory of a political change in June. Former Prime Minister Fukuda's view of "great disturbances in the world" has been getting more realistic every day.

#### A Rough Supreme Counselors Meeting

This is a story a little out of date. The past 19 February must have been the most unpleasant day for Prime Minister Suzuki since his cabinet was inaugurated.

On that day, the LDP's supreme counselors meeting was held at the prime minister's official residence for the first time in 8 months. This meeting was established for the purpose of gathering together current LDP Diet members who are former prime ministers and speakers of either the House of Representatives or Councilors at one place to offer advice to the current prime minister. But, beginning with the meeting held on 19 February, former Prime Minister Nobusuke Kishi joined the group even though he has already retired from politics.

There are several reasons why Kishi, who is no longer a Diet member, was added to those attending the supreme counselors meeting. In the reshuffle of the

cabinet and LDP officials at the end of the year, Prime Minister Suzuki changed his previous attitude of balancing between Fukuda and Tanaka and clearly tilted toward Tanaka. Former Prime Minister Fukuda was uneasy in his heart. Therefore, he tried to regain leadership within the LDP by making Kishi vice president of the LDP.

Suzuki rejected Fukuda's proposal and instead compromised with Fukuda by adding Kishi to the supreme counselors meeting. Although Kishi is Fukuda's former political boss and highly respected by Fukuda, Kishi is also said to be very close to Tanaka recently. Because the supreme counselors meeting has more pro-Fukuda members (Miki, Fukuda, Hirokichi Nadao, and Ken Yasui), Suzuki could correct the imbalance by adding Kishi, who also has a close relationship with Tanaka. Suzuki appears to have tried to make Kishi's addition serve two ends.

Moreover, because Kishi and Miki have been like cat and dog since the 1960 revision of the Japan-U.S. Security Treaty, Suzuki intended to give Miki a warning with the addition of Kishi. The meeting held on 19 February was called a "show with an all-star cast" for Kishi. But at this meeting Miki made a bombshell speech.

Miki's speech was well-prepared. He used carefully selected words, as is often the case in his speeches. But his speech also assumed an unexpected severity in criticizing Tanaka and his faction, which had been considered taboo.

"I really think your (the prime minister's) commitment to administrative reform is right. If you miss this opportunity, administrative reform can never be accomplished. In order to succeed, you need more than anything the people's support. A political party must be trusted by the people. If the ruling party does not reform itself, we cannot keep people's trust. On the contrary, what is the current condition of the factions? To be specific, one faction's expansion is at an intolerably large level. This faction's movement, which seems to point toward formation of "a party within the party," disturbs the order of a public party. There is an atmosphere in the party in which everybody refrains from speaking out of deference to the faction. Under these conditions, party vitality cannot be generated. Mr Kishi once said that elimination of factionalism was 'heaven's voice.' Mr Fukuda has also been trying to check the activity of factions. Right after your inauguration as prime minister, Mr Suzuki also had the party's Executive Committee resolve on the elimination of factionalism. However, recently, Mr Suzuki is tending positively to tolerate activities of the factions. This looks strange to the people, and criticism has been rising among them. I think that the prime minister needs to attend to the whole party system in a real sense. What do you think?"

To Miki's severe words, Susumu Nikaido, the LDP secretary general and alternate leader of the Tanaka faction, turned red and replied. Nikaido defended the Tanaka faction by saying: "Such is not the case. We are managing the party fairly." But it is true that the Tanaka faction has grown into an unprecedentedly large faction of 109 members, and the executive positions of the LDP are almost monopolized by the Tanaka faction. Consequently, the prime minister could do nothing but pass off the matter by smiling. Fukuda also offered his opinion of "party reform," and provided a scene to remind us of "the Miki-Fukuda tie" again.

## Uncanny Movements of Komoto

Following Miki's speech was New Liberal Club President Seiichi Tagawa's address criticizing Tanaka at the New Liberal Club annual convention held on the afternoon of the same day. Tagawa shocked people by saying in a severe tone that "I am ashamed of even having a seat in the Diet together with Kakuei Tanaka, a defendant in a criminal case." Although there are conjectures that Miki and Tagawa conspired to criticize Tanaka, they are nothing more than conjecture.

At any rate, during the LDP's 40-day struggle at the end of 1979, the New Liberal Club supported Mr Ohira rather than Mr Fukuda in the prime ministerial election. Therefore, when the New Liberal Club, which has been thought to be tilting to the Ohira (Suzuki)-Tanaka line, publicly criticized Tanaka--something other opposition Socialist and Democratic Socialist parties could not do--it was shocking.

"Miki and Tagawa were right to say so. There has been nobody else around Nagata-cho [the location of LDP headquarters] who could speak the truth in a normal manner. They broke the taboo on criticizing Tanaka. Tanaka will be criticized at every turn hereafter. This will do considerable damage to Suzuki of the right-angle [the Japanese characters for a right-angle also mean "straight to the kaku" of Kakuei] cabinet" (a member of a neutral faction). "Fukuda could not clearly talk about extremely delicate matters because of Kishi. Nevertheless, he seemed mentally to agree 100 percent with Miki. Eventually my turn [to become a minister] will come" (a member of the Fukuda faction). There is someone who has already indicated Fukuda's movement.

Economic Planning Agency Director Toshio Komoto, who has kept a certain distance from Miki, remained at least superficially silent. At the general meeting of the Komoto faction held immediately after the supreme counselors meeting, there were many who supported Miki's speech. Diet Member Mitoji Sakamoto, who is rash, did not hesitate to speak publicly about "Komoto's resignation from his cabinet post in June."

Sakamoto said: "I advised Mr Komoto not to miss the timing in the deciding game, which would be in June or July. Then, Mr Komoto said that he understood well enough."

Komoto has recently been trying to contact the Fukuda faction. He has secretly been playing golf often with MITI Minister Shintaro Abe, the prince of the Fukuda faction, and Science and Technology Agency Director Ichiro Nakagawa, and improving his friendship with them. Moreover, in order to run in the LDP presidential election this fall, Komoto has been devoting all his efforts to gaining the support of party members in preparation for the primary election.

Komoto is quite dissatisfied with the Suzuki-Watanabe economic policy line of the Suzuki cabinet. Both Abe and Nakagawa have been showing their support for Komoto's economic policies, which place top priority on stimulating the economy. They started direct and indirect criticism of Watanabe's economic management, which is solely based on balancing the budget. How great their dissatisfaction with Watanabe's economic handling is going to grow depends on the prospective revenue deficit, which will be revealed in May or June. If the revenue deficit

exceeds 1 trillion yen, Finance Minister Watanabe may have to resign. If Watanabe refuses to take responsibility and does not resign, it is quite conceivable that Komoto will resign from his cabinet post. If Abe and Nakagawa follow Komoto, it will clearly lead to "a political change."

Angry Provisional Administrative Research Committee Chairman Doko

In addition, an issue causing Suzuki headaches is the Paris summit in June. It is expected that the United States and Europe will harshly criticize Japan over the issue of trade friction. The Masumi Esaki economic mission was already sent to the United States as part of the Suzuki-Nikaido strategy line. However, as already reported by the newspapers, Esaki was asked in harsh tones by U.S. Secretary of Defense Weinburger and others to open the Japanese market and to increase Japanese defense spending; he was struck by them as if he were a sandbag, and he returned to Japan after a hard time in the United States.

This Esaki mission also provided a good opportunity for the anti-mainstream factions to criticize the bad timing of the mission's dispatch to the United States and the general lack of strategy in the Suzuki administration. Miki criticized Suzuki's lack of diplomatic sense in the following way: "It is useless to list only Japanese assertions. If I were in his position, I would tell the United States that the Japan-U.S. relationship is indispensable to both countries, and if the United States is in trouble, Japan is also in trouble. After confirming mutual recognition of each other's position, I would say that Japan will yield what we can. So, I would ask the United States to indicate specifically what it wants Japan to do."

In other words, Miki means that Suzuki should talk frankly with the leader of the United States and settle the issue through "summit diplomacy." "In that sense, Suzuki lacks his own philosophy and principle of diplomacy" (a leading member of the Fukuda faction).

In addition, in April a verdict will be handed down to the politician defendants in the Lockheed trial, Tomisaburo Hashimoto and Takayuki Sato. At present, they are likely to be convicted. In such a case, since the taboo on criticizing Tanaka was broken by Miki and Tagawa, the opposition parties will give Tanaka "advice to resign."

Furthermore, if the name of Nikaido, who has been labelled "a gray high official," also appears in the verdict, Nikaido's label will at least politically change from gray to black.

At the same time, if Nikaido's political responsibility is questioned, depending on the situation, Nikaido may resign as the secretary general, and Deputy Secretary General Noboru Takeshita will be promoted to secretary general. If a secretary general is changed in midterm, it is an abnormal situation for the ruling party. This alone will inevitably shake the future of the Suzuki cabinet.

Moreover, an even larger fetter on the Suzuki administration is the report of the Second Provisional Administrative Research Committee. The recommendation for consolidation and abolition of central ministries and agencies will be

included in the basic report scheduled for July. But the resistance of bureaucrats to this issue is strong and is expected to be a great obstacle to the Suzuki administration.

Considering these conditions, Administrative Management Agency Director Nakasone has advised Suzuki to separate the issue from the basic report scheduled for July. It was obvious that his intention was to postpone the report on this issue until after Suzuki's reelection. Consequently, Nakasone was counter-attacked by the anti-mainstream factions of the LDP. However, one man who got even angrier was the chairman of the Provisional Administrative Research Committee, Toskio Doko, who has staked his old bones on administrative reform. "Suzuki cannot be trusted. After inveigling me with much flattery, he wants to put off the difficult issue. What is all this? First of all, to interfere with the schedule of the committee is out of the question. If he interferes with us again or shows any indication of sabotage, I will immediately resign as the chairman of the Provisional Administrative Research Committee." Thus, he angrily criticized Suzuki.

If Chairman Doko resigns, Suzuki, who publicly promised to stake his political life on administrative reform, will inevitably have to resign as prime minister. The anti-mainstream factions in the LDP are eagerly watching the situation, saying that "if Suzuki upsets Mr Doko, we cannot support the Suzuki administration any longer" (a leading member of the Fukuda faction). The prime minister seems to have been cornered into a situation where he cannot step back even one foot.

#### Dependent on Tanaka As Always

Various difficulties are in store for this year's political situation, in particular in the future of the Suzuki administration. Nevertheless, Suzuki's desire for reelection is fairly great. His only hopes are the Tanaka faction in the LDP and the Komei Party outside the LDP.

If the anti-mainstream factions resist, Suzuki will dissolve the Diet and have a general election at any time. If the anti-mainstream factions oppose the Suzuki administration, it will not hesitate to leave the LDP. These bullish strategies have been spreading through the Tanaka faction's underground radio to warn the anti-mainstream factions. Stated in reverse, the Suzuki administration does not have confidence in itself to tide over the political situation. Even if the prime minister decides to have a general election within the year, there are several reasons why he cannot actually have a general election.

One of the reasons is that the LDP cannot obtain abundant campaign funds from the business and financial world because of the serious recession. Another reason is that, since the 287 seats currently held by the LDP are the maximum number the LDP could win, the LDP is certain to lose some seats in the next election. There is no reason for the LDP to increase the number of its seats if there is an election this year.

In addition, the Tanaka side is spreading a rumor about leaving the party. But this is putting the cart before the horse. Reviewing the history of Japanese

politics, it is improbable that the dirty faction would break with the party and leave the clean faction behind.

A new party will be founded only when Suzuki stubbornly seeks reelection, and the Tanaka faction concurrently approaches the Komei Party in search of a policy agreement to maintain its leadership in politics. It is clear to everyone that the future of the Suzuki cabinet will become more and more difficult.

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## POLITICAL AND SOCIOLOGICAL

### EFFECTS OF SCHISM IN SOCIALIST PARTY ANALYZED

Tokyo KEIZAI TEMBO in Japanese 15 Apr 82 pp 14-17

[Text] The depression of the Suzuki cabinet continues, what with the discord in trade relations between the United States and Japan, the rejection of tax reductions, and the like, and in all the public opinion polls support is at its lowest since the inauguration of the cabinet, with the percentage of nonsupport reaching about 50 percent. At such a time the main opposition party, the JSP, should be making a supreme effort to lay the basis for a transfer of power, yet it is only raising a slogan of "decisive political struggle in 83," while internally the party is fragmented. The ability of Chairman Asukata to govern is totally collapsing, and the disappointment of the populace is steadily deepening. Subject to jests like "Baba who?," the new secretary, Baba Noboru, is also depressed. They say: "We are not trying to fly with only the left engine; these are the labor pains of an emerging party of the whole people," which, as an excuse, is first class, but....

#### Secretary Baba Gets It From All Sides

The birth within the Socialist Party of a "single-engined executive, without the rightwing," occurred on 6 February.

At that time the sponsoring General Council of the Trade Unions of Japan (Sohyo), which had withheld recognition of the new executive of Chairman Asukata and Secretary Baba for nearly a month, froze all campaigning for the Socialist Party. Now, the members of the rightwing anti-Asukata factions, who refused to join the executive, seem ready to call an extraordinary party general meeting next fall to seek to change officeholders, placing the executive in limbo. The most rightwing elements of Sohyo, such as the All Japan Telecommunications Workers Union, are going so far as to threaten to reconsider support of the Socialist Party as long as the present situation continues.

Komeito (the "Clean Government Party"), which in January of the year before last agreed to a plan for joint political action, has suspended its provisional cooperation in the Diet and has refused meetings, not only of the party leaders, but even of the secretaries, and shows no signs of any plans to mend relations.

Within the Socialist Party some 60 percent of the Diet members belong to anti-Asukata factions, so it is fair to say that at the national level the administration of the party is paralyzed. The Asukata-Baba structure is under attack from three directions--from within the party, from Sohyo, and from the other opposition parties--and is in the situation of being unable to take any action.

However, the present chairman, Asukata, remains confident, saying: "My election was no mistake. The recent general meeting of the party was a success, and a most significant one." Secretary Baba calmly says: "Now we shall work for conciliation within the party and friendly relations outside."

The posture adopted by these two is as might be expected, but the rightwing does not join in. It is spreading plausible accounts such as: "They show no hint of reflection at all. When he was appointed secretary, Baba went home and got into bed and rejoiced to his family, 'Ah. I've finally made secretary,'" and anti-Baba sentiment is spreading.

For the rightwing, the worst aspect of the defeat in the chairmanship election was that it had urged from the start that it was necessary to transfer the posts of secretary and national chairman to the rightwing and establish a unified party structure.

However, not only was there no transfer to the rightwing, but an unknown newcomer like Baba was appointed, and the rightwing has counterattacked, saying: "The secretary is the visible face of the party. As he is inexperienced in either party or national affairs, he cannot hold his own in the struggle in the Diet or in the coming decisive political struggle of 1983." In Sohyo, too, Chairman Makieda has urged prudence on Baba, saying: "You are new as secretary of the party headquarters. You have just come up from secretary of the Kumamoto Prefecture (Baba's prefectural base) headquarters." There has never been such abuse of an individual's worth in the case of appointment as a party secretary. Accusations of incompetence are completely unheard of.

#### The Undaunted Chairman

That the counterattacks by Sohyo and the rightwing have gone so far is not at all due simply to uneasiness about inexperience. While Baba certainly is an unknown newcomer, the concern is really due to the fact that he is believed to be very close to Asukata and is assigned a major role in consolidating Asukata's position.

In July of the year before last Baba gathered young Diet members of the chukan (middle) faction of the party and put together a "New Life Study Association," which has recently become a group of some 50 persons. That this became the foundation for Asukata's victory in the chairmanship election is a fact appreciated by the well informed.

The New Life Study Association was from the start called Asukata's bodyguard, and by bringing together chukan faction members and those previously unaffiliated with any faction and creating a powerful faction that can be described as infused with youthful energy, this led directly to Asukata's victory. Also, since his installation as chairman he is said to have no desire to construct a personal faction. This rests on the view that the New Life Study Association was, in a manner of speaking, presented to Asukata by Baba as a "New Asukata Faction."

In the light of this cooperation, the appointment of Baba as secretary has the feeling of a reward for services. Because of this it can be said that Asukata's bold action in respect to this appointment was somewhat forced, in disregard of opposition. On the other hand, for much the same reason, the rightwing cannot evade resisting to the end, to the extent of refusing to serve on the executive.

Asukata certainly lacks majority support at the level of Diet members. However, he has the support of 60 to 70 percent of the 60,000 party members and of the some 400 general meeting delegates, and in this sense he has the most secure party base of any chairman in history. The basis of his confidence is there.

The matter of immediate concern to Asukata is to transfer to the rightwing the two presently vacant vicechairman positions intended for them, and the additional proposed vicechairman position allotted them by the party, always trying to improve relations. Depending on circumstances, he is also thinking of opening an additional middle-level position and giving it to them. However, he is determined that the secretary position will absolutely not be handed over.

After having forced the appointment by his own decision, if he should later revoke it the political liability would be unquestionable. He hears of grumbling among the rightwingers who have boycotted the executive that "2 years without office is hard to take. There must be some post," and appears to see that "the rightwing will by and by become conciliatory."

#### The Rightwing Goes on the Offensive

However, in contradiction to this, as already noted, Sohyo and the rightwing are pressing for the holding of a party general meeting this autumn to reverse these appointments, and at present there is no sign at all of a conciliatory spirit.

Rather they are pondering their inferiority in numbers in both party members and delegates and are girding themselves to move to reconstruct their organization. The rightwing, that is, the anti-Asukata faction, derives from the Seiken Kozo Kenkyu-kai (Society for the Study of Building Power) led by Yamaguchi Tsurao, and the Shakai-shugi Kenkyukai (Society for the Study of Socialism) led by Hirabayashi Go, and now they are pressing to strengthen cooperation between the two groups.

The former Eda group within the Seiken Kozo Kenkyukai continues under former National Chairman Tanabe Makoto, who has formed a "Wednesday Association." This is a heterogeneous grouping comprised of the former Eda faction, the former Kawamaki faction, the former "New Stream Society," the Hori group, and so on, and in order not to give it the appearance of a faction, the former Eda faction had been revitalized and designated the "battle group."

The aim of the rightwing is to "bring down Baba" at all costs. However, though the aim is to remove Baba, at present there is no idea that Asukata will agree. Therefore the desperate feeling persists that "under the circumstances there is no alternative but to drive Asukata to resign," and the strategy seems to be aimed at shaking the Asukata-Baba structure from its roots and completely changing officeholders.

Chairman Makieda and head of the executive office Tomizuka of Sohyo are fully behind this move of the rightwing. They take the view that their priorities are the Spring Struggle and unifying the labor movement, reforming the operation of the three public corporations, including the National Railways, and the 1983 decisive political struggle, and that "with Baba as secretary we cannot carry on at all," and they show themselves ready to establish a cooperative committee of the top levels of the Socialist Party and Sohyo to press for the change in officeholders.

However, in contrast to this tough attitude of Sohyo, the attitude in the circles around Asukata is one of confidently seeing feet of clay. "Makieda is in any case leaving office in June. Tomizuka also has indicated to the headquarters that he intends to stand at the next general election, so both men are "lame ducks." What do they really think to accomplish?" They have no thought of handing over anything but "some posts, not including that of secretary, more or less for the sake of appearances" (a source near Asukata).

Still, even for Asukata, who is persistently confident, it is not true that there is no concern. The fact that his own people in the rightwing and Sohyo are continuing all-out opposition has an impact harmful to the image of the party. And the spirits of Baba, whom he has praised as "a man who will be very valuable in the future; we expect youth and energy," are not improving at all.

Further, more than anything else, he must be worried that relations with the other opposition parties, such as Komeito, are awkward. The socialists are unavoidably isolated in Diet business and will find it difficult to establish electoral cooperation in next year's unified regional and House of Counselors elections.

Concerning relations between the Socialist Party and Komeito, after Komeito at its party general meeting at the end of last year switched to a pragmatic line on security and defense policies, the Socialist-Komeito agreement on a plan to attain power in reality become empty. Then, the Socialist Party also

acted to widen the gap between the two parties by turning to the left with the election of Chairman Asukata. The complete withdrawal from the executive by the rightwing, an act profoundly related both to the emergence of Baba and to Komeito, has had the effect of spurring on this tendency.

The Armament Expanding LDP, the Armament Reducing JSP

Naturally, neither the Socialist Party nor Komeito is at present thinking of tearing up the Socialist-Komeito agreement on plans to attain power. Komeito desires to preserve its revolutionary image by maintaining the relationship with the Socialist Party, and for the Socialist Party it would hardly do to abandon lightly its aim of approaching power through electoral cooperation and a joint struggle of all opposition parties.

However, relations between the Socialist Party and Komeito, and even more with the moderate parties, have been frozen since the appearance of the violent conflict that can be called "the persecution of Baba." During the recent tax reduction battle, Baba was constantly nagged by Yano, secretary of Komeito, and others, and was finally reduced to continually saying, "You're quite right," so that within the party he had to suffer the outcry, "Has he become a yes-man?" Fear of Komei merges into fear of the moderates, of being in a position where the party cannot maneuver independently.

Asukata himself has adopted the posture of "waiting," saying: "It will be resolved in due course." Then he boldly travelled to Europe, where he concentrated on publicizing the view of an "armaments reducing Socialist Party" against an "armaments expanding Liberal-Democratic Party," and took a position in the forefront of the antinuclear and arms reduction movements.

Thereby Asukata displayed nostalgia for the "politics of defiance" of the Socialist Party of the sixties Security Treaty era, and a feeling that he would rather have the party reborn through antinuclear and arms reduction campaigns than switch to a pragmatic line. Chairman Sasaki of the Democratic Socialist Party and others do not conceal their cautious concern: "If the situation is to tilt now so that the moderates get their turn, it will depend on the Socialist Party. We are critical of the turn to the left, but if, in return, there should be an unexpected revitalization of power...."

However, there is nothing to do but wait for the people to decide whether the Asukata line on party administration and political style will receive popular support. The problem is that if this abnormal situation of flying on a single engine, without the rightwing, continues indefinitely and the conflict lasts for long, it will place stress on the organization, for which reason alone things depend on how soon the situation can be brought under control.

However, if Baba resigns it will lead to his own resignation. Just transferring a few posts to the rightwing will not bring the situation under control. Unless both resign together the confrontation will continue.

Even in Baba's base organization, the New Life Study Association, there is discord due to unhappiness at his appointment. Similarly, within the Socialism Association, (Association faction), which supported Asukata, there is a move to abandon him in reaction to his high-handedness. Asukata is in a difficult position.

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MILITARY

NATIONAL, INTERNATIONAL FACTION DEFENSE POLEMICS EXAMINED

Tokyo TOKINO KADAI in Japanese Apr 82 pp 72-75

[Interview with Hachihiro Nakagawa, assistant professor at Chikuba University, by Tetsu Sakuwa: "The Defense Arguments of National and International Factions"]

[Text] Public Problem

It may be an exaggeration to call it urgent, but this month I would like to report on an interview with Hachihiro Nakagawa (assistant professor at Chikuba University). The reason for the interview with Nakagawa is that he is in the thick of a trial.

Perhaps this trial may be called a "defense argument" trial with Masamichi Iinoki (former president of the Defense Academy), or a "freedom of speech" trial.

[Question] What is the origin of this affair?

[Nakagawa] At present, the defense arguments are in an era of a "split in conservatism." It is not an era of confrontation between conservatives and leftists. It is a confrontation among conservatives between those who want to amend the constitution and the U.S.-Japan Security Treaty and those who want to maintain the status quo.

Commentator Yasushi Sakurai wrote in the monthly publication SHORON that this is a confrontation between the international faction and the national faction. And Masamichi Iinoki of the national faction (the faction for maintaining the present status quo) has criticized the international faction (this includes those who advocate the Soviet threat theory) in CHUO KORON as follows:

"If a situation in which the Soviet military very simply gains supremacy over Japan is depicted by those with 'uncertain expertise,' there are many good Japanese who would shudder. As a result, the authors of the Soviet threat theory would frustrate the intent of Japanese resistance in an objective manner and would render service to the USSR's political objectives.

"I do not want to doubt the 'good intentions' of these people, but it results in giving the impression that Japan would surrender without a fight. They themselves fall, as it were, into the Soviet 'trap.'

"The Soviet threat theory should be severed from the issues of maintaining and strengthening Japan's defense capability. It is especially foolish for our attention to be absorbed solely by northeast Asia or the Far East. It is natural that the stationing of Soviet troops on Kunashiri, Etorofu and Shikotan excited Japanese public opinion, but if one is surprised at such an event, his competence for living in the decade of the eighties in the 20th century must be doubted."

Therefore, I, a member of the so-called international faction, wrote in GETSUYO HYORON that such comments from Iinoki "make it seem he has become a representative of the Soviet Government." Then, he did not refute this in writing but brought a civil suit against me.

[Question] Do you think your expression was too severe?

[Nakagawa] No, it was not. If Iinoki, a rational intellectual, is surprised at such an expression, he himself should not have expressed himself in the following manner.

First of all, he did not use specific names, but it is widely known in press circles that the literary scholar is Jun Eto and the philosopher is Michitaro Tanaka.

"I think the scenario in which people who know nothing of law develop strange treatises on legal principles is comical. The situation is serious if this is an era of '100 million citizens negating the entire law.' If it were thought that there are few eminent constitutional scholars, I can understand the feeling of men of learning in other fields wanting to argue the constitution, but the constitutional arguments by a literary scholar and philosopher have no meaning beyond the opinions of individual citizens."

He also heaped scorching words on Ikutaro Shimizu. Let me give you some excerpts.

"We can conclude that this man's treatise (Shimizu) is 'an enormous lie with sprinklings of brilliant truth.'" "He (Shimizu) has entered the stage as a fanciful leader of the militarists." "His method (Shimizu's treatise) is extremely clever." "Certainly there is something in common between the assertions of Shimizu and those of Hitler." Or his comment concerning Ichiro Hatayama: "When Ichiro Hatayama was singing the song of constitutional revision as he drooled...." (SHUKAN GENDAI)

He even used the expression, "drooling" when he criticized Hatayama's arguments for constitutional amendment.

[Question] You were sued for libel by Iinoki, weren't you?

[Nakagawa] Yes. But this is what is strange. The object of the treatise I wrote is a defense essay concerned with the nation's security, and that is ultimately concerned with the advantages and disadvantages to the public and a matter of intense general concern and interest. Its purpose was not the disclosure of his public activities and unrelated private life, nor simply an attack on his person, but clearly something related to the common good.

Iinoki served as president of the Defense Academy for a long time, and at present he holds the position of chairman of the "Peace and Security Research Institute," a foundation authorized by and under the joint jurisdiction of the Defense Agency and the Ministry of Foreign Affairs; and he is a person with the power of influencing government policies. Since he published the treatise under his title of chairman, if one cannot discuss and criticize it, the present democratic system of our country, based on freedom of speech, will crumble at its roots.

By the way, using the FY-80 statement of accounts as an example, the Peace and Security Research Institute is unmistakably a public institution, having received 26.1 million yen from the Defense Agency and 2.5 million yen from the Ministry of Foreign Affairs.

#### Comparison with Soviet Claims

The following account appears in "Nihon no Boei: Shoten to Moten" [Japan's Defense: Focal Points and Blind Spots] (published by Nikkei Shimbunsha) by Tatsuo Yoshikawa.

"Masamichi Iinoki's reaction to 'Kaku no sentaku' [Choice of Nucleus], written by Ikutaro Shimizu, was extremely cold-blooded. Iinoki somehow seems to have rotated to the left in his reaction to this report by Shimizu. And I think it was about that time that it was rumored that Iinoki also took to task the Hideaki Kase-Osamu Miyoshi group as a 'pressure group' and declared that he drew the line between the position of his own research institute as a 'research institute' and theirs. That is to say, Iinoki, who had the backing of the Self-Defense Forces officials until that time, declared his 'estrangement from the self-defense officials.'"

The world, and especially the arguments on defense, are at a turning point. Perhaps this trial is an incident which seems to symbolize the changes of the era.

I asked Nakagawa: "In what way is there a resemblance between Iinoki's statements and statements by the USSR?"

#### Concerning the Soviet Military in the Northern Territories

[Nakagawa] The USSR stated: "There is no basis for Japan to regard it as a threat with just a few troops stationed on the southern Kurile Islands."

Iinoki said: "I am utterly opposed to the thinking that Japan must maintain and strengthen its defense capability since the USSR has built up its

military strength in the Far East area." He also said: "...However, it is quite sad to say we must equip and strengthen our defense capability to confront the stationing of a military force on the three islands."

#### Concerning Soviet Threat

The USSR says: "In the same way, it is wrong to put forward the 'Soviet threat' lie, which is often used in order to justify the position of the Japanese Government" and "Japan is the same; in many countries, influential persons who try to place responsibility on the USSR for the competition in military expansion and the intensification of international tension are very active and are circulating the fabrication about the 'Soviet military threat.'"

On the other hand, Iinoki says: "The scholastic debate over whether the USSR is or is not a threat to Japan, although it may be a liability, is in no way an asset for Japan's defense capability preparedness." And "I want to say that the discussion of whether the USSR is a threat or not is not only unproductive but quite useless and detrimental."

#### Concerning Such Problems as USSR Internal Economy

The USSR's comments are: "During the recent 5-year period, there were 3 years with poor crop harvests. It is natural for us to improve the plan, adapting the planning centered on agriculture to additional factors. For that reason, it is unavoidable that growth will slow a little. Because of that alone, the USSR cannot help but consider reducing somewhat the military burden. Certainly, the Soviet economy's GNP is low compared to that of the United States. It is painful that military expenditures take a large slice of it."

As for Iinoki's assertions: "It is clear that Japan, a neighbor of the USSR which has such strengths and weaknesses, must not make the 'threat' from the USSR the basis for its defense capability preparedness. It is infinitely foolish for Japan to consider the USSR, which suffers from difficult internal and external problems, a 'threat.'"

#### Concerning the Minsk

The USSR said: "There is also much talk about the Minsk, but those who are upset forget that, in fact, there are a total of six carriers in the U.S. fleets, two in the Seventh Fleet and four in the Third Fleet. As can be seen when the figures are listed, there is no threat at all."

Iinoki's view is: "If there is an uproar when the antisubmarine cruiser comes, or a loud cry is raised when the Ivan Rogoff appears, it will only make the Soviets grow more impudent and take advantage of Japan. The same thing can be said of the stationing of the 'Backfire' bomber or intermediate-range ballistic missile, the SS-20."

In fact, what will happen in this trial?

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CSO: 4105/94

## SCIENCE AND TECHNOLOGY

### MAZDA'S TECHNOLOGY DEVELOPMENT FOR THE 1980'S REPORTED

Tokyo ADVANCE TECHNOLOGY DEVELOPMENT FOR THE 1980's in English 1980 pp 1-21

[Text]

#### INTRODUCTION

Energy saving has become a major premise to control our daily life in recent years. The energy consumption in the case of an automobile is classified broadly into material producing energy, vehicle manufacturing energy and vehicle driving energy, and the ratio of these three elements is estimated at 10:5:85. Since the fuel economy is a decisive factor to determine the total economy of a vehicle, it is of a nature which, unlike the exhaust emissions and safety, cannot be satisfied merely by clearing the mandatory standards, but which has to vie for superiority at a much higher level than the mandatory level.

Under these circumstances, we are concentrating our effort on developing various techniques including engine improvement and adoption of electronics for optimum engine control, weight reduction and reduction of running resistance to improve the fuel economy without sacrificing the vehicle performance, drivability, utility, etc. We are aiming at improving the fuel economy by 30% by 1985 through the improvement of these factors mentioned above.

## Engine Improvement

Although we cannot overlook the development of a continuous combustion engine such as a Stirling engine and a gas turbine engine as an alternative engine in the future, these engines in their current state of art are unsatisfactory in respect of their thermal efficiency.

In order to improve the thermal efficiency, it is necessary to raise the operating gas temperature, which to a great extent depends on the development of materials to bear the high temperature. Therefore, we believe, the leading engines in the 1980's are a spark ignition Otto cycle engine and a diesel engine as used to be. In the following, we express our views and prospects on the further improvement with regard to the Otto cycle engine and diesel engine.

### 1 IMPROVEMENT IN EFFICIENCY OF OTTO CYCLE ENGINE

The improvement in engine efficiency will be achieved by the precise engine controls applying electronics, in addition to the improvement in thermal efficiency, reduction of cooling loss, and improvement in mechanical efficiency.

#### 1-1 Improvement in thermal efficiency

The thermal efficiency normally improves if the theoretical thermal efficiency and the combustion efficiency are improved. In order to improve the theoretical thermal efficiency, it is most effective to increase the compression ratio. The relationship between the theoretical thermal efficiency and the compression ratio is shown in Fig. 1.

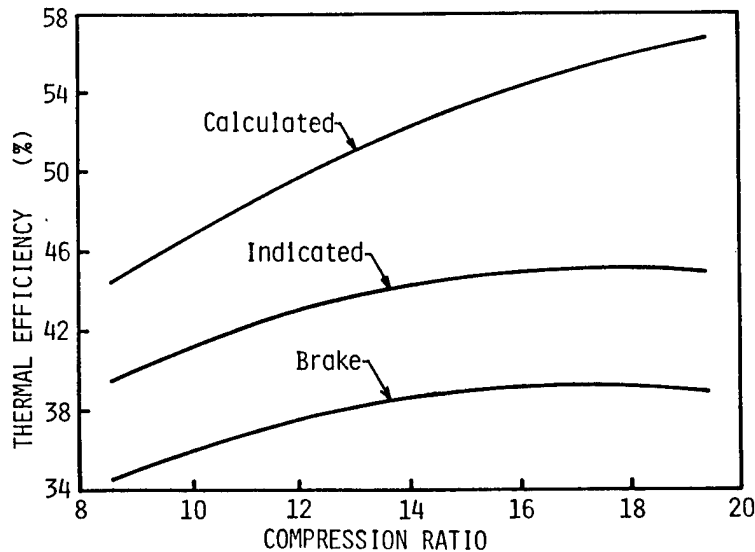
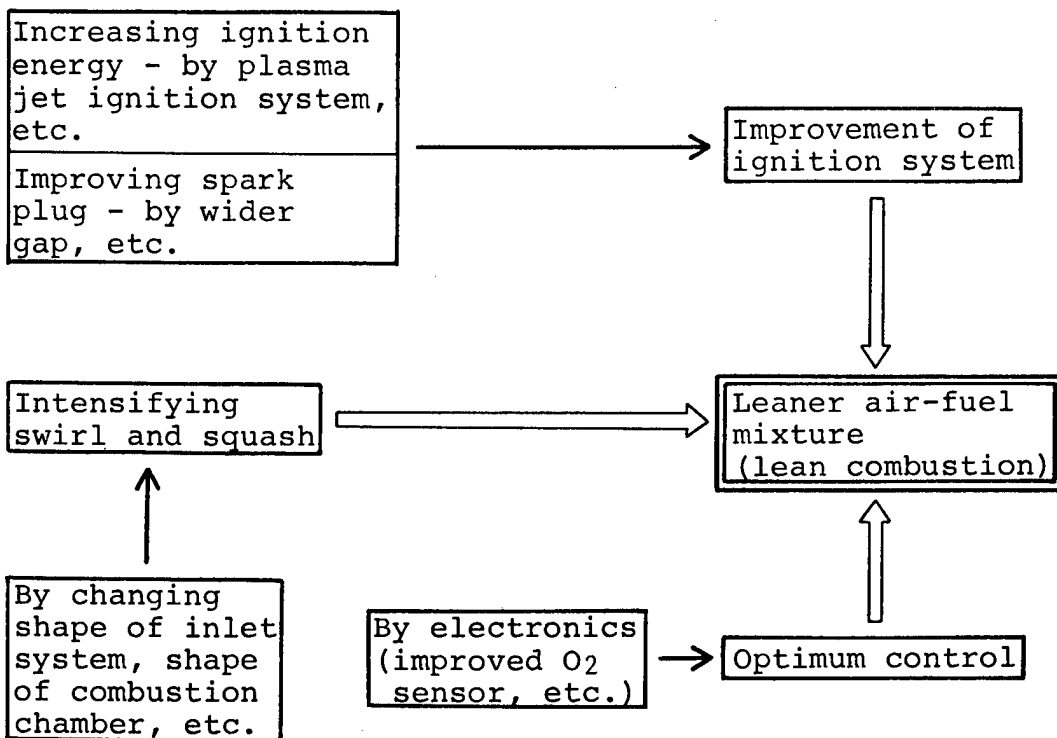


Fig. 1 Effect of compression ratio on thermal efficiency

Increasing the compression ratio requires high-octane fuel, however, since tetraethyl lead among others cannot be added to the high-octane fuel, it now becomes the major subject to conduct research and development not only on the fuel side such as methanol additives and methanol reformed gas additives but also on the anti-knocking measures by improving the combustion mechanism through stratified combustion and wall evaporation. Our target is to achieve the compression ratio of 10 - 11 : 1 in the immediate future and 14 - 15 : 1 in the latter half of the 1980's. If the compression ratio of 14 - 15 : 1 is achieved, the fuel economy of the gasoline piston engine will be improved to a level comparable to the current diesel engine's. In order to improve the combustion efficiency, operating at a leaner air-fuel mixture is the main subject and we are continuing the research in the following direction.



Although the lean combustion with intensified swirl and squash has already been proved in the Mazda Stabilized Combustion System (MSCS), which is applied to the Japanese and North American versions of Mazda gasoline piston engine, we are continuing the research and development to improve this further.

An example of the effect of the ignition system and combustion chamber on the leaning of air-fuel ratio is shown in Fig. 2. It is very clear from this figure that how the swirl in the combustion chamber and ignition energy affect the stable combustion at a leaner air-fuel mixture.

The target of the thermal efficiency improvement by a leaner air-fuel mixture is expected to be about 5 - 10%.

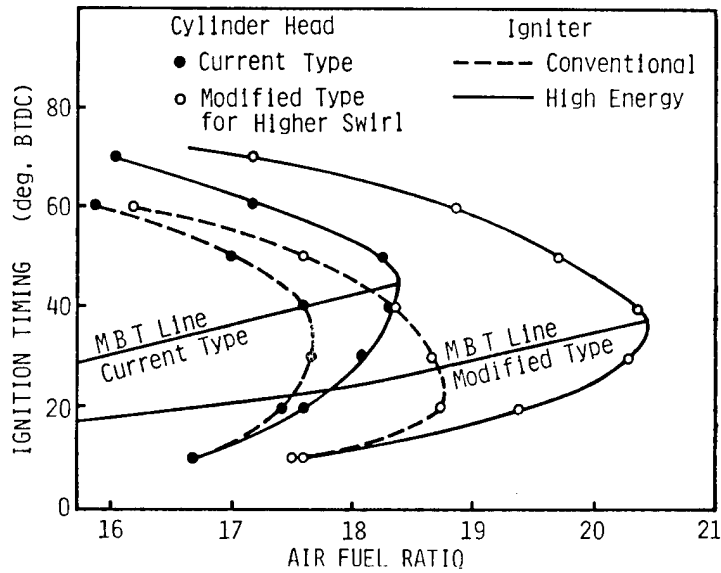


Fig. 2 Effects of high energy ignition and modified cylinder head for higher swirl on misfiring limit

### 1-2 Improvement in mechanical efficiency

When the engine mechanical friction loss is reduced by 10%, we can expect to improve the fuel economy by about 3%. Fig. 3 shows an analysis of the mechanical friction loss and the improved target of mechanical friction loss.

In order to reduce the friction loss, it is the most effective to reduce the piston friction. In addition, the weight reduction in moving parts, such as the crankshaft, connecting rods, pistons, valve train, etc., is also important.

We have already adopted aluminum rocker arms and we are conducting further research to use aluminum or Fiber Reinforced Metal as a material for connecting rods, rocker arms, etc. In addition, there are many accessories which consume power such as

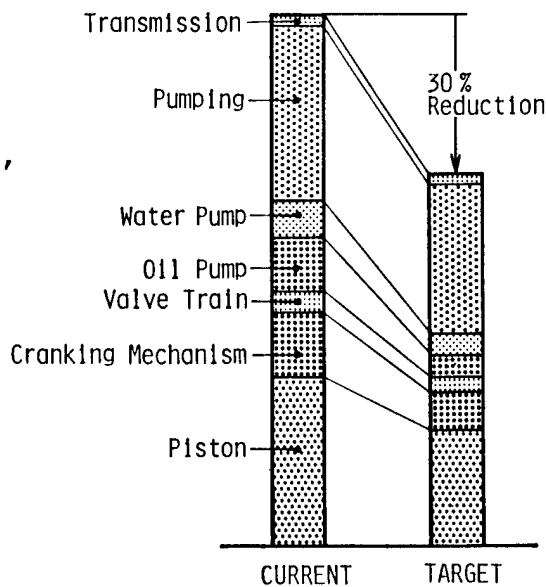


Fig. 3 Analysis of mechanical friction loss and reduction target

an oil pump and a water pump, and we have begun a development to increase the efficiency of these accessories. By putting all these factors together, we are aiming at an improvement in mechanical efficiency by about 30% by the second half of the 1980's. The fuel economy improvement by this activity is projected at approximately 10%.

### 1-3 Electronic engine control

As the air-fuel mixture is made increasingly lean to improve fuel economy, the demands for a precise fuel control, an optimum ignition control and a precise EGR control are getting stronger. In order to meet these demands, we are in process of developing an electronic control, which has already been applied actively to heavy duty vehicles, for light duty vehicles. The electronically controlled carburetor is generally a closed loop type using an O<sub>2</sub> sensor, and it has been clarified that we shall be able to obtain 4 - 5% improved fuel economy by controlling to the stoichiometric air-fuel ratio by this method. However, it is necessary to control the air-fuel mixture on the leaner side than the stoichiometric air-fuel mixture for the purpose of further increasing the effect. For this purpose, it is necessary to develop, for example, a new O<sub>2</sub> sensor which precisely controls mixture at a leaner air-fuel ratio.

In case of adopting the fuel injection method, there will be a greater freedom in selecting the air-fuel ratio by using the closed loop control method coupled with the MAP control method. Furthermore, there will be several other advantages such as simplified starting system, reduced evaporative emission and improved cornering performance, and we believe that the fuel injection system has a higher potential for the future fuel supply system.

We are also conducting research on electronically controlled ignition, EGR, and fuel supply systems. Fig. 4 indicates the improvement in fuel economy by these measures.

Reducing the cost by simplifying the system is as important as improving the effects on the fuel economy and the drivability, and we are now working hard on these themes.

	IMPROVEMENT RATE
Fuel Supply System	4 - 5%
Ignition System	2 - 3%
Exhaust Gas Recirculation System	2 - 4%
TOTAL	8 - 12%

Fig. 4 Improvement of fuel economy by electronic control

#### 1-4 Others

As the future measures to improve the fuel economy, one of our research subjects is to put into practical use a variable mechanism to optimize the lift of the intake and exhaust valves and the open and close timings according to the driving condition. In addition, since the fuel efficiency is especially sacrificed till the engine is warmed up, an atomization device is under development to improve this condition. The effect of the improved fuel economy by this device is expected to be about 20% in short distance driving and about 5% in the U.S. city mode.

#### 1-5 Supercharging

We are currently studying a turbo-charger from two directions. The first is to use the turbo-charger on the current engine/body combination and create the high performance vehicle while keeping the fuel economy at the same level as it is. The second direction is to contrive an increase in low and middle speed torque by combining the turbo-charger with the engine and to reduce the engine displacement by the amount of increase in the torque while maintaining the current performance. According to the test results, it becomes clear that the low-middle speed torque can be improved by nearly 30% by adopting the turbo-charger and if the improved amount is appropriated to the reduction of engine displacement, it improves the fuel economy by nearly 30%. Thus, the merit for improved fuel economy is large. But, there are several problems to be solved by the time of its practical use.

- (1) Improvement of the characteristic of turbo-charging to uplift the low speed torque.
- (2) Reduction of knocking in the low speed range
- (3) Reduction of friction loss
- (4) Cost reduction of turbo-charger

It will take some time to solve these problems and, therefore, the first generation of turbo-charged automobiles will be the former one with optimum fuel economy.

Concerning the first direction, the turbo-charged gasoline piston engine, rotary engine and diesel engine all indicate the similar characteristics. Fig. 5 is a sketch of the turbo-charged piston engine and the performance at laboratory level is shown in Fig. 6.

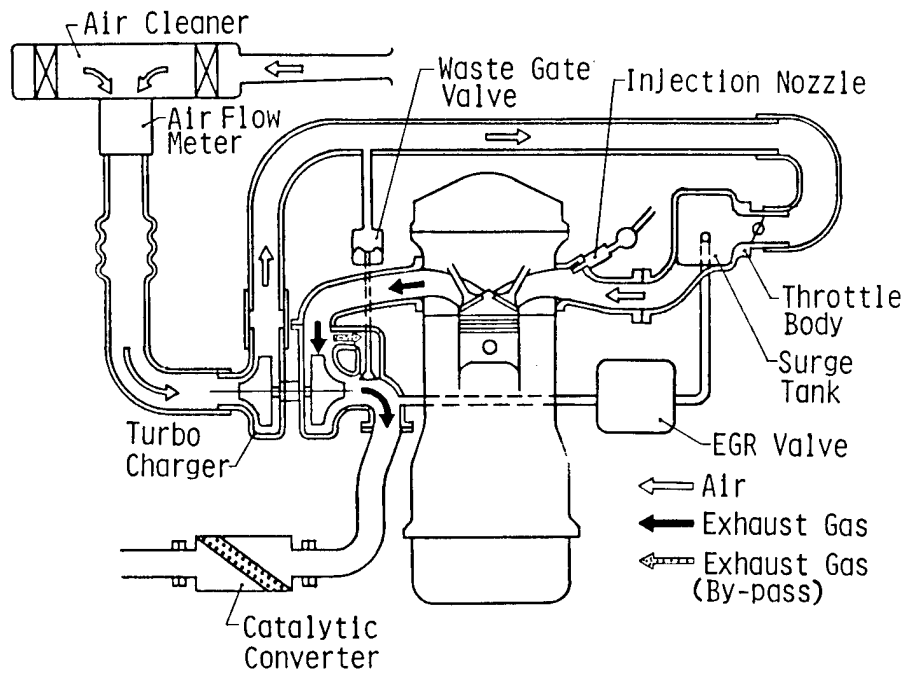


Fig. 5 Turbo-charged engine

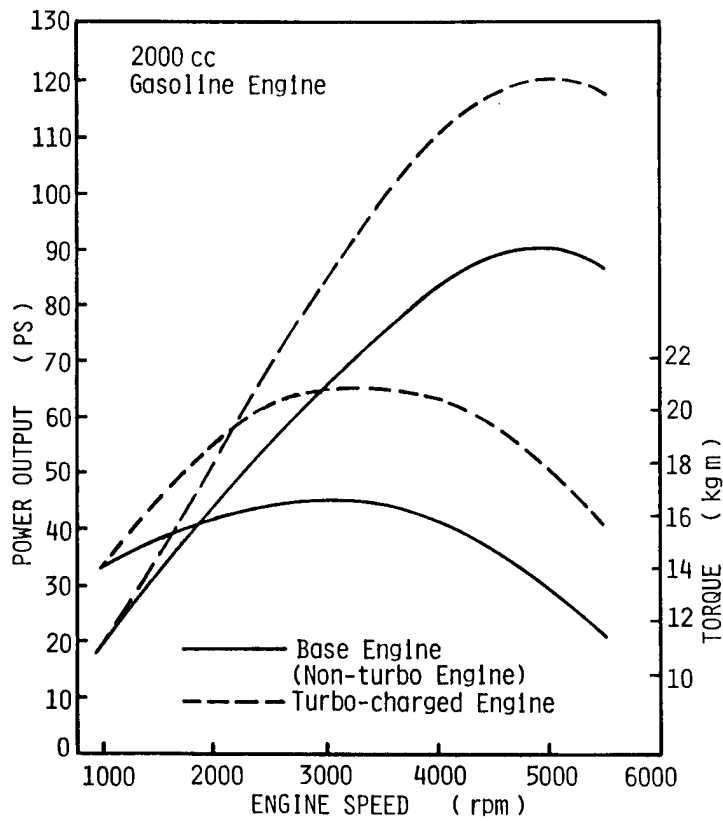


Fig. 6 Performance comparison of turbo-charged engine and non-turbo engine

## 2 FUTURE PROSPECT OF ROTARY ENGINE

The rotary engine is well known as an automobile power plant for its compact size, high output, light weight, quietness, and relative freedom from vibration. It is expected that the environments in which the rotary engine can show its advantages will be even greater in the latter half of the 1980's than at present. It is also fully expected that the rotary engine for automotive use will, with simple modifications, become applicable to new fields, such as marine application as an engine for a motor boat.

It is not too much to say that the chief interest in the rotary engine is the prospect of how much improvement the rotary engine can achieve in its fuel economy in the future. The combination of the rotary engine with catalyst had been deemed impossible in the past, but was put into practical use as a result of Toyo Kogyo's extensive development effort. The rotary engine combined with catalyst was introduced in the Japanese market in September 1979 and will be introduced in the North American market from the 1981 model year. Fig. 7 indicates the fuel economy improvement by the catalyst system and the fuel economy targets of the Mazda RX-7 for 1981 and 1983.

Through the application of catalyst, the rotary engine has been improved in its fuel economy by about 20 % in the Japan's 10-mode test and is already at a level close to a piston engine of the same class. A wide variety of research and development activities are being pushed forward in an attempt to improve the fuel economy by improving the gas sealing efficiency, shape of the combustion chamber, ignition system, and air-fuel mixture supply system among others.

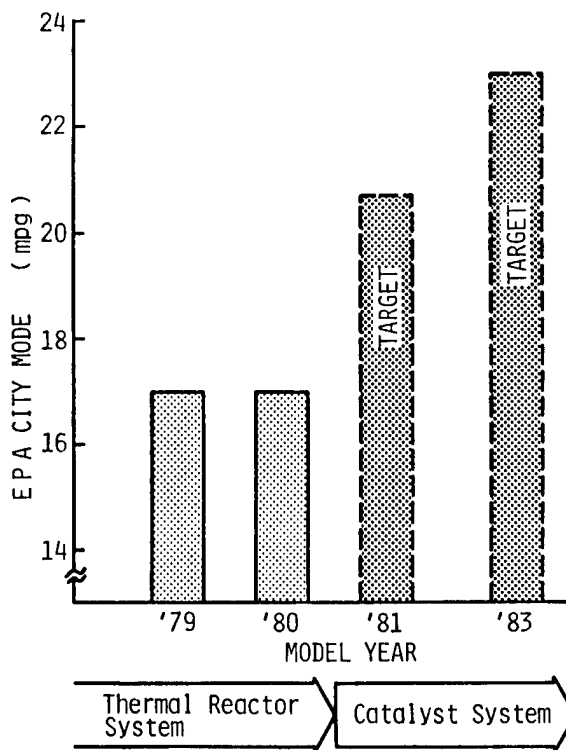


Fig. 7 Fuel economy improvement targets for rotary engine of the RX-7

At the same time, the medium- and low-speed torque is being improved through betterment of the gas seals and intake system (Fig. 9). Various studies are being made, centering around a supercharging system called the TISC (Timed Induction with Super Charge) (Fig. 8), and it is expected that the rotary engine will make rapid progress in its torque at medium and low speeds not in the too distant future.

The realization of this improved torque at these speeds would make it feasible to decrease the final gear ratio and reduce the displacement of the engine and, when coupled with abovementioned techniques to improve the fuel economy, would make it possible to place the rotary engine over the piston engine in fuel economy level.

It is as a matter of course that the rotary engine, which is an Otto cycle engine, should utilize most of the technical innovations discussed in the previous chapter.

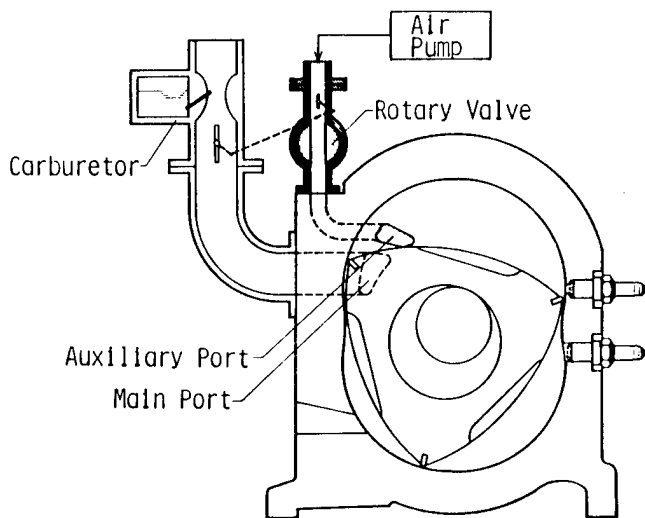


Fig. 8 TISC system  
(Timed Induction with Super Charge)

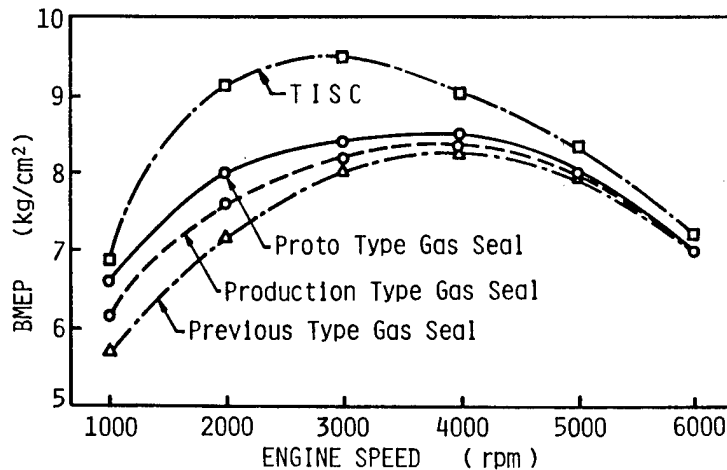


Fig. 9 Effects of TISC and gas seal Improvement on performance at W.O.T.

### 3 FUTURE PERSPECTIVE OF DIESEL ENGINE

Since 1967, Toyo Kogyo has been producing and marketing diesel engined light-duty trucks. In recent years utilization of a diesel engine into the field of a light duty truck has been rapidly expanding in Japan, and the percentage of the diesel engine versions in 2 ton trucks reached 95% in 1979 compared with 54% in 1970. Toyo Kogyo has recently realized utilization of a diesel engine even on 0.75 ton trucks.

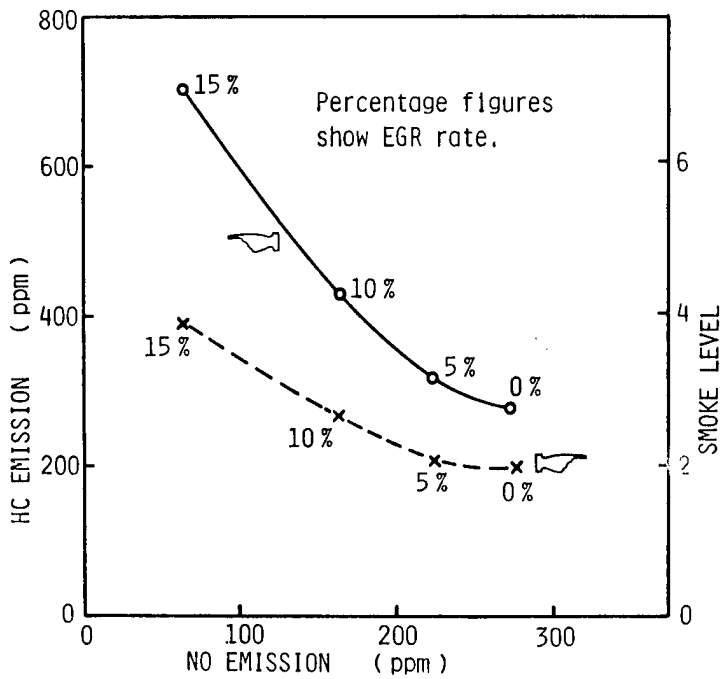
Meanwhile, utilization of a diesel engine in the passenger car field has also been rapidly accelerated in accordance with the gasoline price increase. Though the diesel engine has problems in the aspects of vibration, noise, performance, etc., its fuel consumption is 20 - 35% better than the Otto cycle engine. Whether or not the diesel engine will form the main stream of the passenger car engines in the future will be, however, greatly affected by the pace of the further improvement and progress of the diesel engine and also by the improvement in the fuel economy of the piston engine. Other than the abovementioned, there are problems which affect the future of the diesel engine such as vibration, noise, exhaust gas including NOx and particulates and the diesel oil supply.

We believe that the engine weight reduction and heat insulation of the combustion chamber are the most important to achieve less noise and less vibration as well as improved fuel economy of the diesel engine for passenger cars. As for the heat insulation, we are making every effort to develop adiabatic metals for the combustion chamber and ceramics for some parts. On the other hand, for improvement in the power output and fuel economy, we have already started the research and development of a turbo-charged diesel and a small sized direct injection diesel, because we believe that the feasibility of these engines is the key element. As for the measures against exhaust emissions such as NOx and particulates, development of the optimum swirl chamber shape, selection of the most suitable fuel injection system and development of the after-treatment system are essential.

EGR is a possible measure to reduce NOx; however, when the EGR ratio is increased, the HC and smoke levels increase as shown in Fig. 10.

To cope with this problem and to meet the future particulate regulation, we are studying a particulate trap system.

Fig. 11 is an example of the particulate trap efficiency when a particulate filter is used.



To solve various problems of the diesel engine, the advantage of fuel economy over the gasoline piston engine must always be kept. Therefore, we cannot simply rely on the combustion improvement, but we have to create a total engine system to solve these problems.

Fig. 10 Effect of exhaust gas recirculation on NOx for the diesel engine

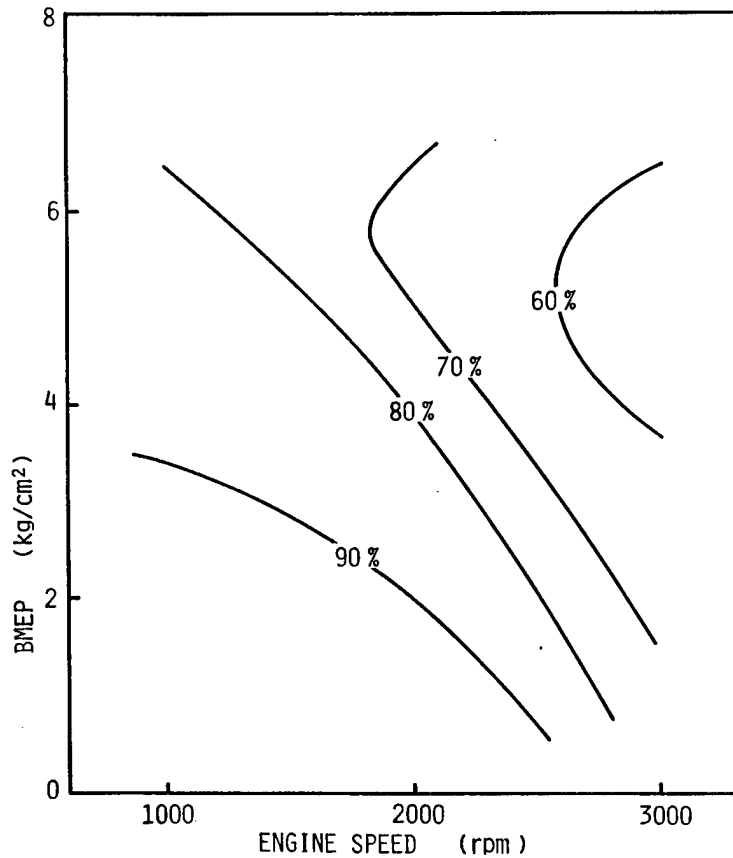


Fig. 11 Particulate trap efficiency

#### 4 ALTERNATIVE FUEL APPLICATION

Because of the shortage of the fossil resources, various types of alternative fuel are becoming spot-lighted in the recent years, such as alcohol-gasoline blend and LPG. LPG is very popular fuel in Japan because the most of the taxi cabs are powered by LPG due to its cost advantage. Toyo Kogyo is a producer of LPG cars for taxi cabs.

Since we have no experience in gasoline/LPG mixed fuel, which is used in some overseas markets, we have started a research and development work on this fuel, too. In the case of alcohol-gasoline blend, application is more complicated than LPG because some kinds of alcohol and additives require special techniques to run the engines on them.

##### Alcohol-gasoline blended fuel

We have been evaluating both methanol and ethanol. According to our test results, ethanol-gasoline blend at a 10% rate, which is already put into practical use in the U.S.A., does not pose any severe problems except some deterioration of vapor locking, hot start characteristics and evaporative emissions.

When methanol is mixed by more than 10% into gasoline, these problems get deteriorated further and wear of the engine components becomes also accelerated in both gasoline piston and rotary engines.

We are carrying out extensive tests on the ethanol-gasoline blend and also carefully studying the acceptability of the methanol-gasoline blend, and development of the following points are important:

- (1) Increase in the compression ratio to utilize higher octane rating of the alcohol fuel
- (2) Ignition control by a knocking sensor to cope with a variety of octane ratings of fuel in the markets
- (3) Development of the fuel injection system to cope with the deterioration of the evaporative characteristic
- (4) Development of the fuel control system for obtaining optimum air-fuel ratio to cope with a variety of fuel in the markets.

## WEIGHT REDUCTION

The effect of the vehicle weight on the fuel economy is great. In the same body shape, the weight reduction of 10% improves the fuel economy by about 2-5%. If the improvement in performance due to the weight reduction is added to the calculation, the improvement rate in the fuel economy becomes more than the double, i.e. about 5-8% improvement in the fuel economy can be expected by the 10% weight reduction. As general methods of the weight reduction, [1] down sizing, [2] rational design, and [3] use of light materials are conceivable. In case of large-sized automobiles, the down sizing may yield great effect on weight reduction. In case of small-sized cars, however, a limit for the down sizing of the vehicle itself naturally exists. Therefore, [2] and [3] become basic measures against the weight reduction.

Regarding the rational design, optimization of the body size, effective design structure, down sizing of the component parts, and reduction of the excess use of materials, become important. In order to make the study on these areas, strength and rigidity analyses under the finite element method and simulations by computers have been widely utilized at Toyo Kogyo. This tendency will be further accelerated in the future.

### 1 TARGET OF THE WEIGHT REDUCTION

By 1985 Toyo Kogyo aims at reducing the vehicle weight by about 10% over the 1980 models (based on the similar equipment level). By this reduction, about 5-8% improvement in the fuel economy is expected to be attained. In order to realize this target of the weight reduction, it is certainly necessary to overcome many problems such as cost, reliability, noise, vibration and safety.

### 2 APPLICATION OF LIGHT MATERIALS

Application of light materials is effective for substantially reducing vehicle weight. When selecting new materials, evaluation of production energy required for each material has to be made.

#### 2-1 Light weight metal

It is clear from Fig. 12 that steel will still hold its dominant position for quite some time to come. Therefore, in order to reduce weight by efficient use of steel, use of high strength steel becomes more important since about 75% of the vehicle weight is currently occupied by steel.

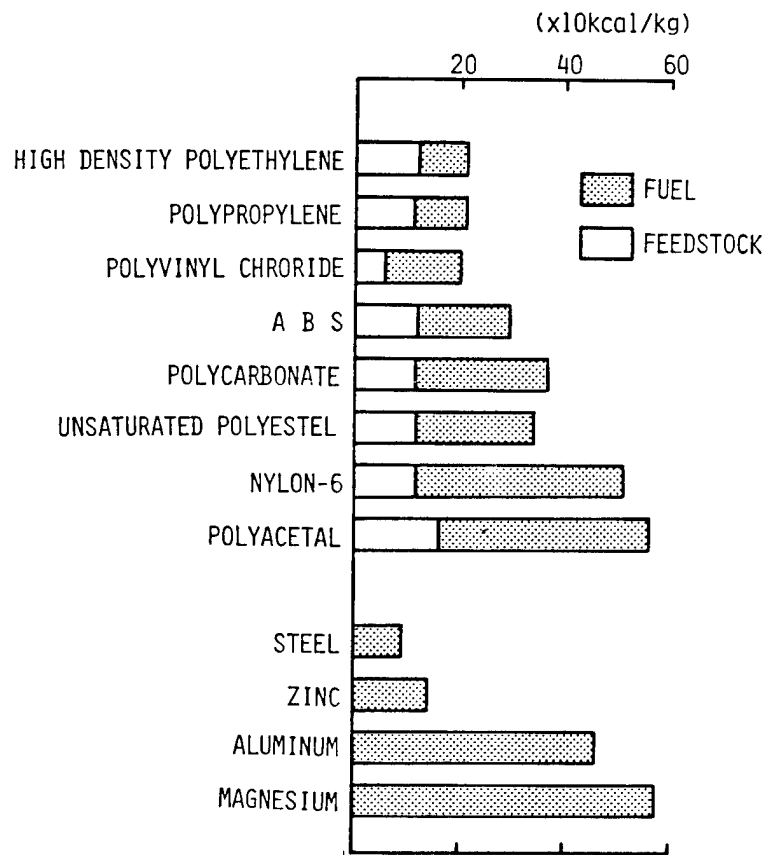


Fig. 12 Energy requirement for producing various materials

In case of Toyo Kogyo, the high strength steel has already been applied to new Mazda 323/GLC. Although the high strength steel will be used mainly for body reinforcement members as shown in Fig. 13 for the time being, it is expected to be gradually expanded over external body panels. Since, the high strength steel sheet enables the reduction of the conventional steel thickness by 10 - 15%, it is possible to decrease the weight by 10 - 15%.

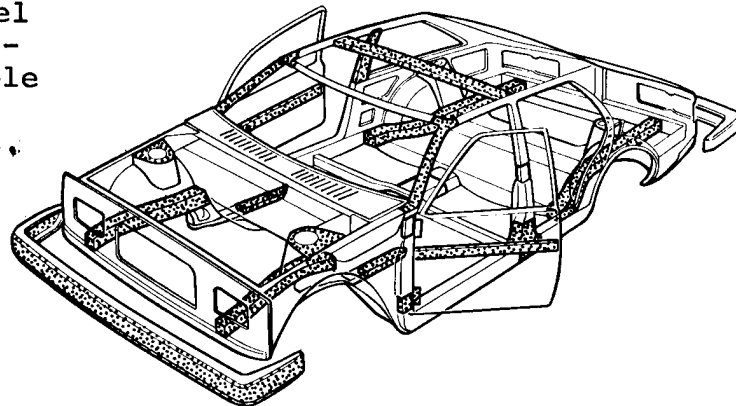


Fig. 13 Application of high strength steel

Materials such as aluminum and magnesium have already been applied to automobiles to some extent and these materials will be more widely used in the future (Fig. 14, 15 and 16).

Especially magnesium is an attractive material, and its applications to the transmission case, clutch housing, timing chain case, etc. are being studied at Toyo Kogyo.

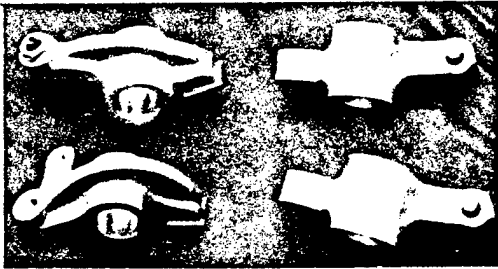


Fig. 14 Aluminum rocker arm



Fig. 15 Aluminum shift fork

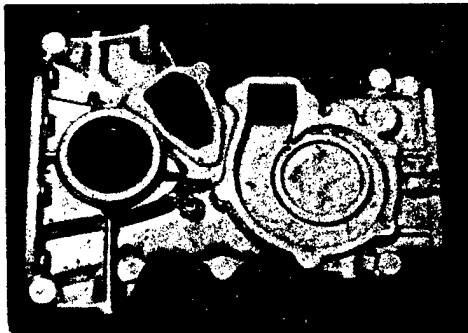


Fig. 16 Magnesium timing chain case

## 2-2 Plastics

Plastics will play an important role in the weight reduction in the future, and Toyo Kogyo is carrying out the development in the following fields in addition to the application of general purpose plastics (Fig. 17).

(1) Engineering plastics

Engineering plastics like nylon, phenolic, etc. are being studied for application to many parts such as cylinder head cover, oil pan, timing belt pulley, and carburetter (Fig. 17, 18 and 19). Many of these will be realized in the first half of 1980s.

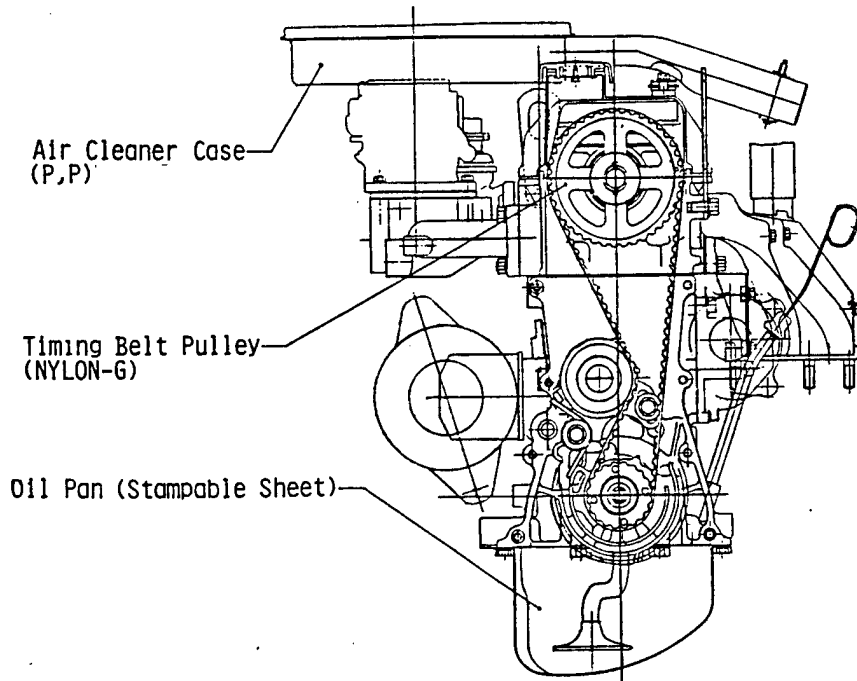


Fig. 17 Application of general purpose plastics and engineering plastics

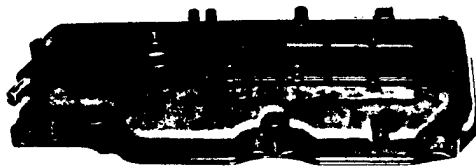


Fig. 18 Plastic cylinder head cover



Fig. 19 Plastic thermostat cover and change control case

(2) Reinforced reaction injection molding

Study of reaction injection molding (materials like polyurethane which is produced by hardening two types of liquid materials injected into a mold) is now being carried out to reinforce its rigidity with fiber glass, etc. for future applications to external body panels such as fender and external door panel (Fig. 20). There is a great possibility that these applications will also be realized in the first half of 1980s.

(3) Fiber glass reinforced plastics

Polyester reinforced by fiber glass is being studied at Toyo Kogyo as an attractive material in terms of cost, strength, and rigidity, but problems of surface finish, shrinkage, etc. must be solved. Bumper beam, bonnet, trunk lid, sun roof, etc. are considered as its area of use (Fig. 20).

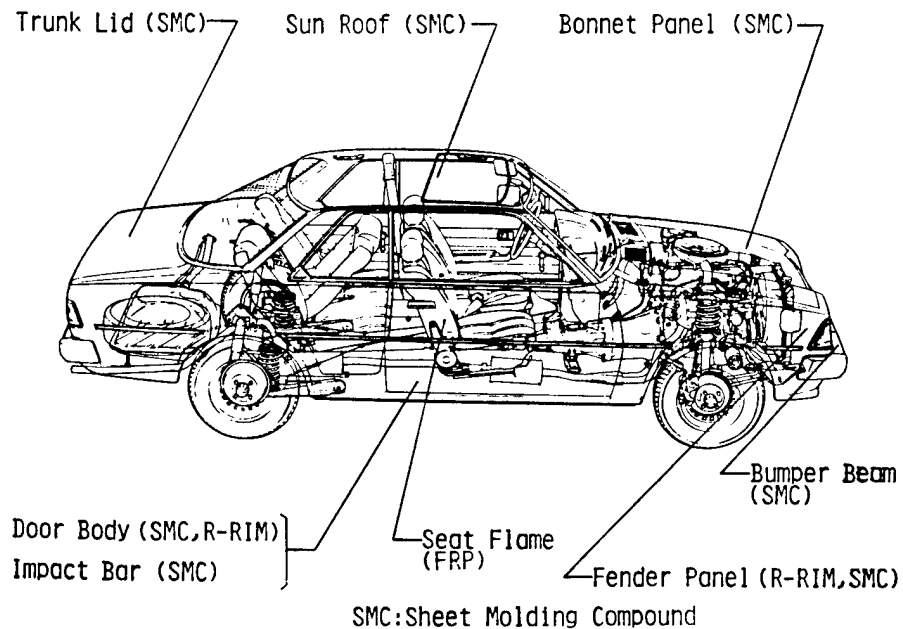


Fig. 20 Application of reinforced reaction injection molding and fiber glass reinforced plastics

(4) Graphite fiber (carbon fiber) reinforced plastics

Although this is plastics reinforced with expensive carbon fiber, researches on its application to the component parts which require strength and rigidity are being carried out. A sharp reduction in the production cost can be expected if mass production facilities will be set up in the future. Its applications to propeller shaft, leaf spring, suspension arm, etc. are being studied (Fig. 21).

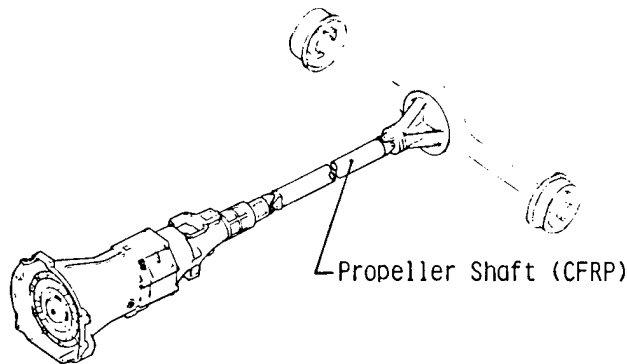


Fig. 21 Application of graphite fiber (carbon fiber) reinforced plastics

### 3 PROCESSING TECHNIQUE

Research subjects among others are techniques of manufacturing thin plastics and cast metals which will accomplish both the weight and cost reductions and of producing a compact structure by using electron beam welding. The subjects for energy saving measures also include techniques of plasma carburizing, powder forging and the methods with which welding time is short and welding distortion occurs less.

#### Running Resistance

From the standpoint of fuel saving, the reduction of running resistance is an important factor as well as the improvement of engine itself and the reduction of vehicle weight.

Running resistance can be classified into two factors; air drag and rolling resistance. As shown in Fig. 22, the air drag increases sharply when vehicle speed increases while the rolling resistance moderately rises with the increase in the vehicle speed. At around 50 - 60 mph, the air drag reaches the equivalent level to the rolling resistance and at the higher speeds, the air drag plays a critical part in running resistance.

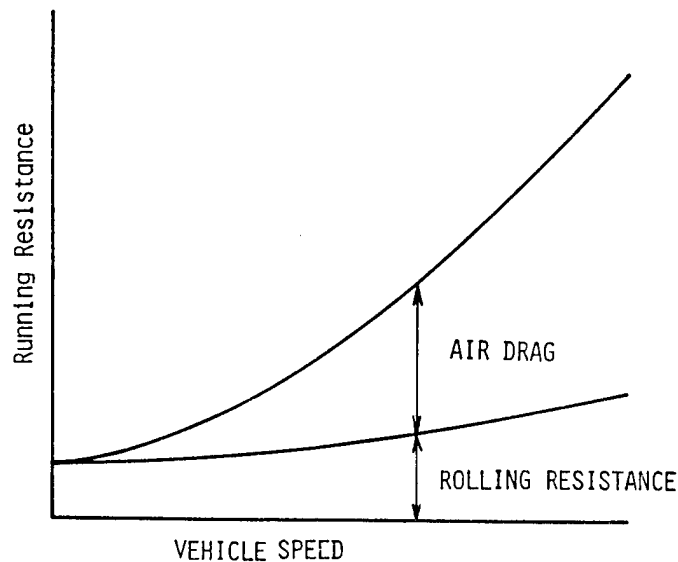


Fig. 22 Relation between running resistance and vehicle speed

## 1 AIR DRAG

Air drag is determined by the multiplied product of frontal projected area, air drag coefficient ( $C_d$ ) and dynamic pressure, while the frontal projected area cannot be changed greatly from the standpoint of an interior space requirement.

In case of Mazda,  $C_d$  of existing models varies within the range of 0.36 - 0.51 depending on vehicle types or body shapes.  $C_d$  can be substantially reduced without making any profound change of the basic body shape of the vehicle if various portions are effectively designed. Fig. 23 shows an example of achieving nearly 25% reduction of  $C_d$  from the original with the least change in various parts of vehicle design.

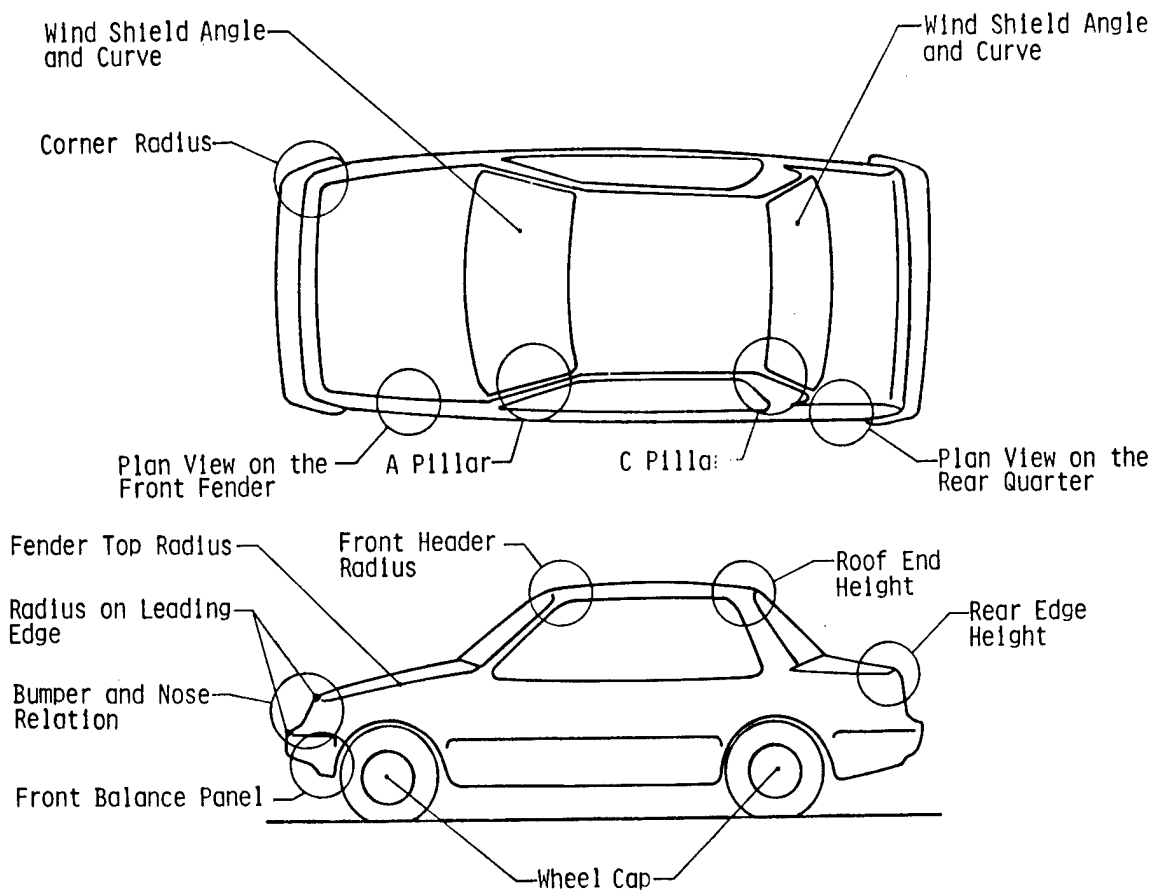


Fig. 23 Effect of various parts design on Cd reduction

Although Mazda 626 has already reached the Cd level of 0.38, which is one of the best in its class, Toyo Kogyo is further advancing its researches into aerodynamics aiming at the Cd target of 0.35 (sedan) - 0.30 (sports and sporty types) in the latter half of 1980's. With this improvement in aerodynamic efficiency, more than 10% fuel economy improvement in highspeed driving can be expected to be obtained.

## 2 ROLLING RESISTANCE

Rolling resistance is caused by the tire, brake drag and friction of the drive train. About 90% of the rolling resistance is by the tire and, therefore, major reduction of the rolling resistance can be accomplished by improving the tire.

Rolling resistance by the tire is mainly generated by an hysteresis loss caused by the distortion of the rubber and code of the tire. Therefore, we are carrying out the study on the selection of the optimum structure

and material which causes less hysteresis loss to reduce rolling resistance.

Toyo Kogyo is also making every effort studying suspension among others to further improve cornering performance, handling stability and comfort, which generally contradicts the reduction of rolling resistance.

Currently 30% reduction of rolling resistance is aimed at improving fuel economy by 4% in city driving and by 6% in highspeed driving.

CSO: 4120/274

## SCIENCE AND TECHNOLOGY

### STRATEGY FOR COAL LIQUEFACTION DISCUSSED

Tokyo ENERUGI FORAMU in Japanese Apr 82 pp 16-17

[Text] Japan's coal liquefaction policy now stands at the crossroads.

The first shock came last year when the SRC-II coal liquefaction project, a joint project of the United States, West Germany and Japan, was suddenly terminated. The second came this February with the decision to delay construction of the EDS (Exxon donor solvent) method pilot plant, another project for coal liquefaction depending on international cooperation.

Ministry of International Trade and Industry (MITI) and NEDO (New Energy Development Organization) circles, however, seem to have taken the calm view that this is "a natural result of the situation in which the United States finds itself."

The real problem now is that of how to formulate an independent Japanese liquefaction strategy. But because this is a time in which the interim long-term energy supply and demand forecast is being revised and the 1985 goal for new energy--primarily liquefaction of coal--is said to have undergone a "major downward revision" of more than 10 million kl from the earlier goal of 38.5 million kl, commercial expectations have been deflated. It is hardly possible for the private sector alone to pursue projects such as coal liquefaction, and positive, indirect aid from the government sector is now more necessary than ever.

The primary reason that the United States has postponed its coal liquefaction projects at this time is the collapse of crude oil prices which accompanied the worldwide decline in demand for oil. The result was the decision to slow down the development of alternative energy sources.

Moreover, the U.S. possesses abundant domestic petroleum, coal and oil shale resources, and has a broad range of options--including alternative sources of energy--for its total future energy supply. It can thus be assumed that there is little need to expend great effort promoting coal liquefaction just when the price gap between coal and crude oil is closing (that gap had been growing wider in recent years as crude oil prices shot upward). The postponement of coal liquefaction in the United States was a reasonable move.

But for Japan, which has scant domestic energy resources, the encouragement of alternative sources of energy is something which must be given full effort, no matter what the market conditions are for crude oil. The diversification of crude oil import sources and the promotion of alternative sources of energy to diversify risk have become even more important to Japan's economic security.

Consequently, MITI and NEDO have decided to reinforce Japan's strategy through unification of three domestic liquefaction projects. Previously the Sunshine Plan had covered parallel development of: (1) solvent extraction liquefaction technology, (2) solvolysis liquefaction technology, and (3) direct hydrogenation liquefaction technology.

With regard to (1) solvent liquefaction, the Sumitomo group (Sumitomo Metal Industries and Sumitomo Coal Mining Co) is now operating a coal processing experimental plant which handles 1 ton per day. The (2) solvolysis method, which is one form of solvent liquefaction (it is characterized by the possibility of reactions with only atmospheric pressure in the reactor vessel), is being developed by the Kyushu Industrial Laboratory and Mitsubishi Heavy Industries; a 1-ton-per-day experimental plant is now in operation.

And as for (3) direct hydrogenation, Nippon Kokan KK, Mitsui Shipbuilding & Engineering and others are now operating a 2.4 ton per day experimental plant.

Thus, for each of the methods there is only an experimental plant with a capacity of 1 or 2 tons per day. Considering that a 250-ton-per-day pilot plant is already operating in the United States using the EDS method, for which Exxon is said to have decided a postponement, one cannot deny that Japan is far behind.

However, a technical analysis of the three methods shows that both the solvent extraction method and the solvolysis method use hydrogen, so there is no clear-cut difference separating the three.

Therefore, in light of the emerging strategy of focusing investment of talent and finances, and considering fiscal cutbacks on the basis of "administrative reform," there is growing support for "consolidation of the three methods into one." Both MITI and NEDO seem to have begun studies and analyses on consolidation into one method with a tentative target date of August, when the budget for the coming year is to be firmed up.

At present, Australian lignite liquefaction is the only international cooperation project for unaided "Hinomaru coal liquefaction," part of the Sunshine liquefaction plan. Japan Lignite Liquefaction Co (a private joint venture of five companies including Kobe Steel and Mitsubishi Chemical Industries) is now operating a half-ton-per-day experimental plant at Kobe Steel.

Current policy is to go ahead quickly with commercialization; work has begun on construction of a 50-ton-per-day pilot plant in Victoria, Australia, which is to begin operation in 1984. The total construction cost is to be

40 billion yen, of which NEDO is to disburse 12.3 billion yen for FY-82. NEDO is said to be strengthening its liquefaction strategy with a focus on two lines: this Australian lignite method and the three Sunshine methods. Study is also being given to reconstituting SRC-II as a completely Japanese project.

The biggest problems now are fostering a liquefaction industry and procuring funds. A commercially viable plant which processes in excess of 20,000 tons per day would require from 600 million to 1 trillion yen. The prerequisites are formation of a large market and cooperation between government and private sectors in procurement of funds.

In the case of international projects, procurement of funds in the dollar market is essential, and will require the efforts of the Japanese to whom coal liquefaction is most attractive. It is certain that, in the words of a MITI official, "What would take one year now will take 3 or 4 years in another decade."

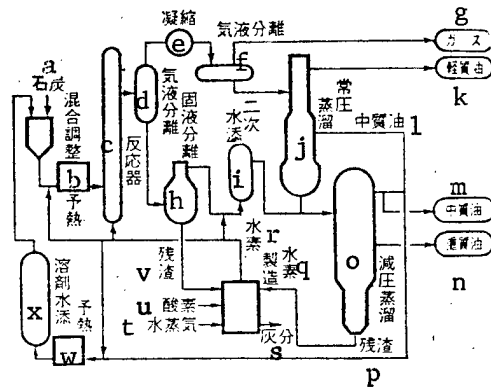


Diagram: Solvent Extraction Liquefaction Project

Key:

- |                             |                          |
|-----------------------------|--------------------------|
| a. Coal                     | n. Heavy oil             |
| b. Preheating of mixture    | o. Vacuum distillation   |
| c. Reactor                  | p. Residue               |
| d. Gas/liquid separation    | q. Hydrogen production   |
| e. Condensation             | r. Hydrogen              |
| f. Gas/liquid separation    | s. Ash                   |
| g. Gas                      | t. Steam                 |
| h. Solid/liquid separation  | u. Oxygen                |
| i. Secondary hydrogenation  | v. Residue               |
| j. Atmospheric distillation | w. Preheater             |
| k. Light oil                | x. Solvent hydrogenation |
| l. Medium oil               |                          |
| m. Medium oil               |                          |

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