

Current I/M practice and a future national I/M regulation of China

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1. Introduction

In most Chinese cities/towns, there has been an I/M program in place since 1980s, which focuses mainly on safety performance of vehicles. Idle/free acceleration emission tests are currently included in the system, but the lack of a national code regarding the practice of such emission testing largely reduced the effectiveness. The existing I/M program was managed by the public security department before, it is required by the new Clean Air Act amendments (2000) to be jointly supervised by both environmental protection agencies and the public security department, with environmental protection agencies responsible for emission tests. This paper will present an analysis of current I/M program with regard to emission tests, supplemented by the recommendation of a future national I/M regulation concerning motor vehicle emissions.

2. Current I/M program in Chinese cities

2.1 General situation in China

“Periodic inspection, obligatory maintenance, repair if needed” is the principle of vehicle maintenance in China. For commercial vehicles, maintenance must be implemented on schedule, according to the travel miles or interval prescribed by transportation administration department. The maintenance includes daily maintenance, first-, second- and third-degree maintenance.

The emission control of newly produced vehicles is essential to preventing and controlling vehicle pollution. Meanwhile, the effective supervision and administration of maintenance program is an important piece of the resolution for in-use vehicles emissions.

At present, the test method of I/M program in China is primarily idle test for petrol vehicle, with 2 speed idle test in some regions like Beijing, and snap acceleration smoke test for diesel. In general, the test program includes periodic and unscheduled inspection:

- Periodic inspection and maintenance test (PIMT)

The annual inspection, which means periodic test on in-use vehicles annually, is commonly implemented by traffic administration office under public security department.

- Unscheduled inspection

It includes roadside testing and spot-checking where necessary. The inspection items are implemented according to the demand.

2.1 Repair industry management

In order to guarantee the quality of maintenance, industrial standard --the Criterion of Vehicle Maintenance Technique-- was issued in 1995 by ministry of

transportation. It placed such factors that affect exhaust as the cleanness of gasoline filter, air cleaner, spark plug gap, ignition distributor gap, valve gap and carburettor on the list of second-degree maintenance. Meanwhile, inspection of other factors affect exhaust such as spark advance angel, cylinder pressure is required so as to decide whether repair is needed or not. Besides, the standard also demands exhaust inspection in second-degree maintenance to assure vehicles after maintenance can meet the national requirement on vehicle emission. Therefore the second-degree maintenance is an important tool for vehicle emission control.

At present, the industry of vehicle maintenance in China is turning from being occluded and self-serving to open and community-running step by step. A relatively stable and active market for maintenance has been formed with State-owned, group-owned, private, Sino-foreign cooperative or Sino-foreign joint venture enterprises. Multi-channels, multi-forms and multi-levels feature this market with more than 220 thousand enterprises.

2.3 The I/M system in Beijing and Shanghai

At present, there are 38 inspection stations with integrated capability in Beijing, which includes 68 vehicle inspection lanes and 11 motorcycle inspection lanes. 9 stations are responsible for giving registration license to new vehicles, as well as the inspection of old in-use vehicles beyond 10 years, while the other stations are in charge of annual inspection of vehicles only.

The I/M program in Beijing covers all types of vehicles. The inspection is implemented annually and the adopted method is 2 speed idle, with detailed limit values referred to DB11/044-99. The organization form of I/M program in Beijing is primarily a mixing one, that is, the periodic annual inspection is implemented in inspection station for all vehicles, and the vehicles that fails the exhaust emission tests should return to inspection station for retest after maintenance. In most of the inspection stations, repair service and maintenance sites are supplied, which allows maintenance of the vehicles that fail in exhaust tests implemented in the station.

In Shanghai, the periodic inspection is annually implemented, along with the safety check in traffic administration. The inspection lanes for inspection of vehicle performance used in Shanghai can be divided into two types by function, the inspection lanes for safety and the lane with integrated capability. The overall inspection lanes amount to more than 130, including those under manufacturers and first- and second-class maintenance enterprises. The approximate distribution status is listed in table 1-1.

Table 1-1 Distribution of vehicle inspection lanes in Shanghai

Property of inspection lanes	Possessor department	Number of lanes
Lanes for annual inspection	Municipal vehicle administration office under police	44
Inspection lanes for maintenance	Municipal vehicle maintenance administration office	17

	Public transportation corporations in Shanghai	8
	Municipal government affiliated vehicle groups	1
	Taxi corporations in Shanghai	5
	Friendship taxi corporation	2
	Zhenhua taxi corporation	1
	Donghu taxi corporation	1
	Volkswagen taxi corporation	3
	Garages (maintenance stations)	75
Inspection lanes for quality supervision during production	Volkswagen, Buick automobile limited corporation	4
	Enterprises such as Zhonglian, Wanxiang	11
Inspection lanes for vehicle research and chassis dynamometers	Technological center of automobile(motorcycle) industry in Shanghai	1
	Shanghai Fanya automobile technological center by Sino-American joint venture	1
	Shanghai united electronic corporation	1
	Shanghai tractor and automobile corporation	1
	Automobile academy of Shanghai Tongji university	1
	Shanghai transportation research institute (scaffolding)	1
	Shanghai diesel engine institute (diesel chassis dynamometer)	1
	Shipping transportation research institute (diesel chassis dynamometer)	1

3. Weakness of current system and needs for a national rule

I/M program in China is primarily involved with three administrative departments, which consists of traffic administration agency under police, transportation agency and environmental protection bureau. Traffic administration agency under police is in charge of the organization and administration of annual inspection and transportation agency for maintenance. Environmental protection bureau participates giving license to inspection and maintenance enterprises and supervises the quality of inspection and maintenance, Cooperation among the three departments is the key issue for a successful I/M program.

Air Pollution Prevention and Control Law of PRC (revised) was admitted in the 15th conference of 9th standing committee of the NPC. The 35th term in this law

concerns the commission to environmental protection departments the charge of annual inspection for in-use vehicles. The detail is as follows:③The chief administrative department of environmental protection under people's government of a province, autonomous region and municipality directly under the central government can delegate the implementation of annual inspection on vehicle emission pollution according to the code to those enterprises in charge of the inspection that has been given license by police.⑤⑤The chief administrative department environmental protection under local government of a county or the upper can implement supervision and spot inspection of the pollutant emission from in-use vehicles at the parking places.⑨

Major problems identified in the current system is listed below:

- Cooperation among the administrative organizations is to be strengthened.
- It is lack of effective supervision method to the irregular behavior of drivers, inspection and maintenance personnel.
- Supervision on the quality of vehicle maintenance is to be strengthened.
- There is insufficient knowledge of I/M program for drivers and daily service in the society.
- It is lack of effective method for the analysis of implementation effect that involved organizations are hard to adopt aimed improvement measures according to the current status of implementation.

4. Framework of a national I/M regulation

The new I/M regulation will be targeted to reducing vehicle emissions, with the Environmental Protection departments in the core of administration. The basic idea is, a framework will be defined in the national regulation, under this the local government, mainly municipal governments could implement their own I/M programs. 2 types of I/M program will be defined, i.e. basic I/M and enhanced I/M programs, referring to unloaded tests and loaded tests respectively. According to air quality needs, local government can make the judgement of what type of I/M programs they should be implementing, in light of the criteria set out by the national rule, criteria parameters include air quality status, motor vehicle numbers, GDP level, as well as population.

The recommended I/M network type is a fully centralized one, which is proved internationally to be the most cost-effective way of enforcement. National government will develop a series of tailpipe emission test procedure and limit values, for both types of I/M programs. Local government can change the vehicle coverage, choose the test procedure to be used, given that it comply with the regulations. In addition, local authorities can increase the test frequency, or choose a more comprehensive test procedure than required, to make the program more stringent. That means, the national regulation sets out the baseline content of requirements, local authority can go even more stringent, but not more lenient.

Furthermore, the national regulation will set out requirements on quality control, public awareness raising, quality auditing, data reporting, and effectiveness

evaluation. These components are crucial toward a complete and successful I/M program. Very often some parts of these key issues are missed in the current I/M programs, which largely reduced the potential effectiveness.

5. City-wide implementation of new I/M programs

According to the new national I/M rule, local governments, usually local Environmental Protection Bureau (EPB) which will be taking the lead, shall make an assessment and feasibility study, before they can submit an implementation plan to the national authority (or up one level government agency) responsible for I/M supervision. The implementation plan shall document all items defined in the national I/M regulation, to make sure that a complete package of I/M program will be implemented, and the emission reduction target could be achieved.

After the implementation plan is approved by the upper level authority, local government will take actions to implement it. A lot of enforcement mechanisms shall be done at the local level, requiring coordination among different government departments such as the public security (police), and transportation departments. Finally, the effectiveness evaluation process is very important for the further improvements of I/M programs, as well as problems identification.

6. Discussions

I/M program is widely considered as an important component of motor vehicle pollution control strategy. A well maintained I/M program can be very cost effective, both for reducing emissions from gross-polluters and supplement to emission controls of new vehicle standards. But it requires very careful design and well monitoring, otherwise it can be very expensive and inefficient. Cheating is the most common problem arisen from all kinds of I/M program, which is also one of the key issue in current Chinese practice. A fully centralized network can be easily monitored to avoid this problem at the lowest cost, which is highly recommended by the new national I/M regulation. Quality control and auditing is always the most important part of a successful I/M, while this is largely overlooked in a lot of real programs. Therefore, a national rule to highlight such key issues will help to enhance the effectiveness of a real I/M program greatly.