
THE AUTOMOBILE AND TECHNICAL REGULATIONS

1 Introduction

Amid growing interest in environmental and energy issues, various countries are continuing to tighten regulations. In addition, concerns over real driving emissions (RDE, which measure emissions while driving on the road) by the emissions scandal have prompted Japan and Europe to take the lead in establishing RDE regulations.

In terms of safety regulations, new regulations and guidelines concerning vehicle-to-vehicle (V2V) communication, cybersecurity, e-Call, and other matters involving communication outside the vehicle are being established at an accelerated pace.

2 Overall Trends

2.1. Japan

On the topic of mutual recognition, the establishment of the International Whole Vehicle Type Approval (IWV-TA) scheme proposed by Japan, which served as chair and led discussions at the United Nations, has been deliberated, and preparations to issue the UN regulation (UN R0) in June 2018 are underway.

With respect to emissions regulations, the test cycle for light-duty passenger vehicles and light-duty trucks will change to the Worldwide harmonized Light vehicles Test Cycles (WLTC) on October 1, 2018, and regulation values for emissions were revised and brought in line with those of the current cycle.

In response to the diesel vehicle emissions scandal, a government review panel is drafting guidelines on the prohibition of illegal devices (defeat strategy).

2.2. The U.S.

Work related to advanced safety technologies is moving forward rapidly, as exemplified by the issuance of a draft proposal on V2V a communication, voluntary guidance on cybersecurity, and a draft proposal for a voluntary guidance on autonomous driving. In anticipation of the spread of those technologies, a guidance, rather than

a regulation, is being issued in more and more cases.

The Environmental Protection Agency (EPA) has started applying the Tier 3 emissions regulations, which are equivalent to the California LEV III regulations that came into effect with the 2015 model year, to 2017 model year and later light-duty vehicles in the U.S. The California Air Resources Board (CARB) made various amendments, including revisions to the fault criteria for the OBD regulation applying to the LEV III regulations and detailed provisions on the diagnostics requirements for hybrid vehicles.

Although the EPA had completed its midterm review ahead of schedule and determined not to change the GHG regulations for the 2022 to 2025 model years, the new EPA Administrator overturned that decision and, as with the CAFE regulations, the review will proceed as originally planned.

2.3. Europe

Commission Delegated Regulation (EU) No. 2017/79, which establishes detailed technical requirements concerning the mandatory installation of the system that automatically make an emergency call in the event of a traffic accident (eCall) stipulated by Regulation (EU) 2015/758, was issued and will come into effect from the end of March 2018.

The introduction of the Worldwide harmonized Light vehicles Test Procedure (WLTP, which applies a new test cycle and procedure) and of the real driving emissions (RDE, which measure emissions while driving on the road) regulations synchronized with the September 2017 Euro 6c standards, as well as the application of the revised procedures for the evaporative emissions test method starting with September 2019, have been determined. For the WLTP, global standardization expanding the scope from the new test cycle and procedures under the UN framework to other regulatory items (such as low temperature test methods), is being assessed. The European Commission is actively participating in those

assessments with an eye toward incorporating them in EU regulations.

Taking the introduction of the WLTP regulations into account, the NEDC-based CO₂ regulations scheduled to start in 2020 (regulation values of 95 g/km for light-duty passenger vehicles and 147 g/km for light-duty commercial vehicles) will be replaced by WLTP-based values starting in 2021. The assessment of the strengthening of the post-2020 CO₂ regulations has begun, and remains a policy directive at this stage. In the meantime, the European Commission is planning to issue a regulation proposal that includes regulation values firmly based on the WLTP.

2.4. Other Regions

China has promulgated the two-phase China 6 emissions regulations, which will be applied to light-duty passenger vehicles nationwide from July 2020 and July 2023. The early introduction of the China 6 regulations in important regions is under consideration. In addition, a draft policy proposing mandatory quotas and credit management for new energy vehicles was presented to the WTO.

In Hong Kong, for light-duty vehicles the Euro 6b will apply from July 2017, and the Euro 6c from September 2019, while for heavy-duty vehicles, the Euro VI will apply from January 2018.

The various ASEAN members are adopting safety standards and tightening emissions regulations as they prepare to implement harmonized standards and mutual recognition. Already determined regulations include the adoption of UN Regulation No. 19 in Cambodia (June 15, 2019) and the application of Euro 4 emissions regulations in Vietnam (January 2017 for gasoline vehicles, and January 2018 for diesel vehicles).

2.5. United Nations

2.5.1. Harmonization of Standards

The World Forum for Harmonization of Vehicle Regulations of the United Nations Economic Commission for Europe (WP29) was established as the body to promote international harmonization of automotive technical standards. WP29 has been meeting regularly to discuss the 1958 Agreement (mutual recognition agreement) and the 1998 Agreement (global agreement). The aim of the 1958 agreement, currently signed by 53 European and other countries as well as 1 region, is to formulate UN regulations to establish uniform technical standards for vehicles and obtain mutual recognition of those standards. There

are currently (as of the end of 2016) 138 such UN regulations, with new regulations for additional items currently being formulated. The 1998 Agreement went into effect in August 2000 as a means of establishing and realizing GTRs, and includes 34 participating countries and 1 participating region as of the end of 2016. The addition of WLTP and tires in 2014 has brought the number of items covered by established GTRs to 16. Furthermore, additional GTRs on items such as light-duty vehicle emissions, fuel economy testing methods, hydrogen and fuel cell vehicles (phase II), pedestrian protection (phase II), tires (phase II), and quiet vehicles (acoustic vehicle alerting system), are also being revised or formulated.

2.5.2. System for Mutual Recognition of International Whole Vehicle Type Approval

The WP 29 discussions on the establishment of a system for the mutual recognition of International Whole Vehicle Type Approval (IWVTA) have entered the final stages. Within the framework of revision 3 of the 1958 Agreement, the IWVTA scheme, an initiative, proposed by the Japanese government to extend the current 1958 Agreement-based mutual recognition of approval for devices, parts and systems to cover the whole vehicle, is scheduled to be established in June 2018 as UN R0 and make mutual recognition mandatory from March 2019 in countries that adopt UN R0.

3 Japan

3.1. Vehicle Safety

3.1.1. Progress of Safety Measures

In a report on the course of future automobile safety measures compiled in June 2016, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) raises (a) addressing accidents involving children or the elderly, (b) measures for the safety of pedestrians and automobile occupants, (c) measures to address grievous accidents involving heavy-duty vehicles, and (d) addressing new technologies such as automated driving as its four pillars of vehicle safety measures.

3.1.2. Strengthening of Safety Regulations and Harmonization of Vehicle Regulations

Based on the 1958 Agreement, the MLIT is revising Japanese technical standards in line with revisions to UN Regulations. In 2016, the standards concerning the safety performance of hydrogen vehicles, full lap frontal impacts, daytime running lamps, devices for indirect vision, acoustic vehicle alerting system (AVAS) (specifically pro-

hibiting a pause switch), and tire installation were introduced. In addition, based on the aforementioned report, revised Japanese standard on mandatory automatic head light and technical guidelines on systems that respond to driver abnormalities were drafted ahead of the revisions to UN regulations.

3.2. Emissions

3.2.1. Promotion of Measures on Emissions

Based on the 12th report on the Future Policy for Vehicle Emission Reduction submitted to the Minister of the Environment in February 2015 by the Central Environmental Council of Japan, the current test cycle was replaced with the Worldwide harmonized Light vehicles Test Cycles (WLTC) specified by UN-ECE/WP29 for passenger and other vehicles. Exhaust emissions regulation values, OBD thresholds, and other criteria were also revised. These changes will apply from October 2018, and work to establish the rules and standards enabling WLTC certification to start ahead of that date. Test methods and other parts of the evaporative emissions regulations were also revised based on the above report.

3.2.2. Strengthening of Regulations for Diesel Heavy-Duty Vehicles

Starting in October 2016 (2018 for OBD), the strengthening of regulations on nitrogen oxides (NOx), the change of test cycles (from the current JE05 to the WHDC), the introduction of a test methodology and regulation values for off-cycle emissions (Off-cycle Emissions (OCE) Global Technical Regulation), the mandating of advanced on-board diagnostics devices, and relaxed mandatory installation requirements for blow-by gas reduction devices on vehicles equipped with superchargers meeting regulatory requirements, will be applied gradually.

3.2.3. Diesel Vehicle Emissions Scandal

A government review panel is drafting guidelines on the prohibition of illegal control in diesel passenger and other vehicles to prevent a diesel vehicle emissions scandal. In addition, test conditions, standards, and other criteria are being examined to introduce real driving emissions tests (RDE) similar to those adopted in Europe.

3.3. Fuel Economy

The tighter fuel economy standards set to apply in 2020 for passenger vehicles and 2022 for light-duty trucks will be measured using the current test cycle (JC08). However, the switch to fuel economy measured according to the Worldwide harmonized Light vehicles Test Cycles (WLTC) for catalog values is under examina-

tion. The values for both the JC08 cycle and WLTC will be indicated during the transition to the latter.

3.4. Promotion of the Spread of Low-Emissions & Fuel Efficient Vehicles

A tax system (the so-called green tax system or fuel-efficient car tax reduction) that reduces vehicle-related taxes, such as the vehicle excise tax, motor vehicle weight tax, and vehicle acquisition tax, is in effect to promote the spread and popularization of low-emissions and fuel-efficient vehicles. The criteria for vehicle eligibility are stipulated in the outline of the 2017 tax reform. The standards for 2017 are stricter than the current ones, and will be further tightened in 2018. In terms of exhaust emissions criteria, compliance with the current 4-star low emissions certification standard is required.

3.5. Substances of Concern

Regulations mandating regulatory content limits and labeling for headlamps and other products containing mercury have been enacted.

4 The U.S. and Canada

4.1. Vehicle Safety in the U.S.

4.1.1. Vehicle-to-Vehicle (V2V) Communication

In January 2017, a draft proposal to make the Basic Safety Message (BSM) specification, performance requirements for dedicated short-range communication (DSRC) equipment, and other on-board devices mandatory was issued.

4.1.2. Acoustic Vehicle Alerting Systems (AVAS)

The final rule mandating the installation of a sound generating device in EVs and HEVs was issued in December 2016.

4.1.3. Cybersecurity

A voluntary guidance on approaches to cyberattacks and other cyberthreats was issued in October 2016.

4.1.4. Distracted Driving

The phase 2 voluntary guidelines draft proposal that also covers portable devices, including smartphones and navigation systems, were issued in December 2016.

4.1.5. Automated Driving

A draft proposal for a voluntary guidance, including a 15-point safety assessment, was issued in October 2016. It applies to autonomous driving defined as level 2 and above in the SAE J3016 standard.

4.2. Emissions in the U.S.

4.2.1. Federal Regulations

The EPA has set Tier 3 emissions regulations that are

almost fully harmonized with the California LEV III regulations and started implementing them with the 2017 model year. In addition to the emissions regulations, the OBD regulations have also been brought in lines with those of California. In response to the emissions scandal, they tighten evaluations of emissions control system and also add a road test to the certification test.

Spurred by the below mentioned proposal from California, work on formulating Low NOx standards for heavy-duty vehicles by 2024 has begun.

4.2.2. California

4.2.2.1. ZEV 2.0 Regulations

The tightening of regulations from the 2018 model year requires making plug-in hybrid electric vehicles, electric vehicles, and fuel cell vehicles compliant, and requirements concerning the number of vehicles are becoming more stringent every year. The details of the regulations are revised on a regular basis, with the next revision in March 2017, and the state government currently has no plans to make amendments.

4.2.2.2. Emissions Regulations

The LEV III regulations were implemented from the 2015 model year, and corporate average exhaust gas regulation values are being strengthened every year. In addition, PM regulations are also being tightened in stages, to 3 mg/mile from the 2017 model year, and 1 mg/mile from the 2025 model year.

4.2.2.3. OBD Regulations

The regulations were made stricter with the 2016 amendments, which include setting malfunction thresholds for LEV III compliant vehicles, defining clear diagnostics requirements for hybrid vehicle parts, and expanding the number of test items and amount of required data during certification.

4.2.2.4. Low NOx Standards for Heavy-Duty Vehicles

An initiative to implement a regulation reducing low NOx standards up to tenfold over the current standards by 2023 has been put in motion.

4.3. Fuel Economy and GHG Regulations in the U.S.

4.3.1. CAFE and GHG Regulations

The EPA and NHTSA released a Technical Assessment Report in preparation for the review of the regulations for 2022 to 2025 determined in 2012. Although the previous EPA Administrator had moved up the schedule and decided in January 2017 not to change the GHG regulations, but due to the need to examine CAFE and GHG

regulations concurrently, the new Administrator reinstated the original schedule, and the review of regulations for the 2022 and subsequent model years will proceed.

In accordance with a 2016 congressional directive, the penalties for non-compliance with CAFE regulations will become approximately 2.5 times higher starting with the 2019 model year.

4.3.2. EPA Fuel Economy Labels

Explaining the disparity between fuel economy labels and actual fuel economy has long been a problem. After purchasing vehicles on the market and carrying out its own road load tests, the EPA used the results to issue new guidelines with stricter monitoring requirements for road load. In addition, it has revised the coefficient used in the 5-cycle fuel economy formula. Both changes come into effect from the 2017 model year.

4.3.3. Phase 2 Fuel Economy Standards for Heavy-Duty Vehicles

The Phase 2 standards to come into effect in three stages in 2021, 2024, and 2027 were announced. A new Cycle Average method is now employed, and for hybrid vehicles powertrain tests will be required.

4.4. Substances of Concern in the U.S.

In 2016, the federal Toxic Substances Control Act (TSCA) was updated, broadening EPA authority and also strengthening its powers for the purpose of enabling more effective gathering of and management of information concerning risks related to existing chemical substances. The use of substances of concern, copper, and copper alloys in brake friction material will be gradually prohibited (5% from 2021, and 0.5% from 2025 onward). The use of the current refrigerant (R134a) will be banned in light-duty vehicles sold in the U.S. starting with the 2021 model year.

The Safer Consumer Products (SCP) regulations have come into force in California, with restricted substances and products covered by the regulations specified every year.

4.5. Canada

4.5.1. Vehicle Safety

The final Side Impact Protection Regulations (CMVSS 214) harmonized with the U.S. FMVSS 214 were issued in October 2016. In November 2016, the regulation covering rear view mirrors (CMVSS 111) was aligned with the U.S. FMVSS 111 with a draft proposal on the mandatory installation of rear view cameras, and a draft proposal for

a new ejection mitigation regulation (CMVSS 226) harmonized with the U.S. FMVSS 226 was issued.

4.5.2. Fuel Economy and GHG Regulations

Harmonizing with the U.S., the Canadian federal government has decided to apply fuel consumption label values based on the 5-cycle test methodology, and simultaneously changed the design of the labels, which apply from the 2016 model year. As in the U.S., GHG regulations were strengthened starting with the 2017 model year, but a higher multiplier has been set for advanced technology vehicles. Quebec and other provinces are moving to adopt the GHG or ZEV regulations.

4.5.3. Environmental Protection

Regulations mandating reporting and labeling for headlamps and other products containing mercury have been enacted. There are plans to prohibit the use of the current refrigerant (R134a) in light-duty vehicles to follow U.S. starting with the 2021 model year.

5 Europe

5.1. Whole Vehicle Type Approval (WVTA)

Amendments to European Directive 2007/46/EC, which establishes a framework for vehicle type approval in the EU are under review and include strengthening current market surveillance requirements, implementing type approval procedures, streamlining multi-stage approval, making obligation of the certification of aftermarket parts, and addition of requirements on repair and maintenance, and so on. The dialogue between the European Commission, the European Parliament, and the European Council started in July, and the amended regulations are expected to be finalized in 2017.

5.2. Vehicle Safety

5.2.1. eCall

Detailed technical regulations for the regulation that mandates the installation of a eCall system in which emergency call are automatically or manually made an emergency call center with the vehicle's data and location data in the event of a traffic accident were issued in September 2016. The UN is also currently examining those same technical regulations as new regulation proposals retaining compatibility with the European ones.

5.2.2. GSR

The mandatory installation of advanced safety technologies (AEBS, ISA, LKA, ESS, EDR, SBR on all seats, direct TPMS, rear view monitors, driver monitors, and pedestrian airbags), as well as the introduction of collision

safety requirements (full lap collisions, small overlap collisions, far-side occupant protection in side collisions, and rear-end collisions) are under examination as amendments to GSR ((EC) No. 661/2009), which aims to improve the safety and environmental performance of vehicles while also simplifying the legal system. The European Commission has set halving the number of 2010 traffic accident fatalities by 2020, and is planning to issue an amendment proposal that accounts for not only cost effectiveness, but also market competitiveness, in early 2018.

5.3. Emissions and OBD

5.3.1. Light-Duty Vehicles

The RDE regulation effective from September 2017 stipulates NOx and PN regulation values, and stricter NOx values will apply from January 2020. Examinations to finalize the still undetermined in-service test requirements by the end of 2017 are making progress. The evaporative emissions test procedure incorporating revisions such as a shorter preparation cycle before the test, longer diurnal test period, and additional durability requirements will come into effect in September 2019. With respect to the WLTP, the discussions involving following up on the establishment of the new test cycle and procedures under the UN framework (Phase 1) with the addition of items such as a low temperature, durability, and market test methods, as well as OBD regulations (Phase 2) are still underway. The European Commission is actively taking the lead in those activities with an eye toward both incorporating them in its own regulations and ensuring they integrate EU aims.

5.3.2. Heavy-Duty Vehicles

The uncovering of the European manufacturers' defeat device scandal has prompted the examination of a proposal aimed at making it mandatory to submit detailed data on engine control as part of the certification documents.

5.4. CO₂ (Fuel Economy)

In conjunction with the introduction of the WLTP regulations in September 2017, the NEDC-based CO₂ standard scheduled to start in 2020 will be replaced with the WLTP-based value, which will be applied the following year in 2020, based on each manufacturer's 2020 NEDC-based CO₂ compliance rate.

The study to start implementing more stringent post-2020 CO₂ regulations between 2025 and 2030 currently underway is expected to offer proposals focused on the

establishment of strict WLTP-based regulation values, the expansion of ZEV and low-emission vehicle market share (through, for example, revisions to vehicle and fuel taxes), and the setting of pre-2030 midterm targets.

The European Commission is now developing VECTO, a simulation tool for the certification of heavy-duty vehicle CO₂ emissions and fuel economy requirements. Monitoring is planned to start in stages from 2018.

5.5. Recycling and SOCs

The end-of-life vehicles (ELV) Directive (2000/53/EC) restricts and reduces the use of four types of heavy metals (lead, mercury, cadmium, and hexavalent chromium). Metals other than lead are already fully prohibited, and the 8th revision to strengthen the regulation is currently awaiting the publication of an Official Journal of the European Union. Initial audit requirements applicable from 2012 (2009/1/EC) were added to the Directive concerning WVTAs with respect to recyclability certification (2005/64/EC).

REACH, the European Community Regulation on chemicals and safe use that entered into force in June 2007, has the requirement about the registration and reporting of chemical use to government authorities, as well as the disclosing information to users of chemicals, mandatory ((EC) No. 1907/2006). Any usage restrictions on chemical substances related to automotive products will generally be handled under this regulation. Prohibiting methanol in window washer fluid and phthalate acid in plastic components is currently under consideration.

The classifying, labeling, and packaging (CLP) regulation, which stipulates the requirements for the classification, labeling, and packaging of hazardous substances, is currently in force and applies to items such as puncture repair sealants, adhesives, oils, and window washer fluid ((EC) No. 1272/2008).

The existing Biocides Directive (98/8/EC) was revised as a biocidal products regulation and any chemical substances applied to vehicle parts as a biocide are subject to the usage restrictions and information disclosure requirements ((EU) No. 528/2012).

5.6. Vehicle Exterior Noise

The UN issued a regulation stipulating AVAS requirements (UN R138), and is also deliberating a requirement to prohibit the pause function in alerting systems as part of the 01 series. The acoustic vehicle alerting system (AVAS) requirements in the EU regulations on vehicle exterior noise will be amended based on UN R138.

5.7. Russia

In the Eurasian Customs Union (EACU), the Technical Regulation of the Customs Union (TR CU), a common approval system based on Russian regulations, came into effect for new models starting in January 2015. These regulations apply to all vehicles starting in July 2016. It was decided to make it mandatory for vehicles to be equipped with the Russian version of the European eCall system (ERA GLONASS) ahead of Europe. The requirement (which, unlike European eCall, also applies to heavy-duty vehicles) was applied to new model vehicles starting in January 2015 and has been extended to existing vehicles from January 2017. Euro 5/V regulations for emissions came into force in January 2014 for new models, and in January 2016 for existing passenger vehicles but were postponed to January 2018 for other than passenger vehicles.

6 Central and South America

6.1. Mexico

6.1.1. Vehicle Safety

Regulations from major areas (U.S., EU, UN and others) on basic safety systems for light-duty vehicles (head restraints, seats, seat belts, controls and indicators, speedometers, mirrors, hood latches, defrosters and defoggers, wipers and washer systems, lamps, tires, brakes, and glazing materials) came into effect with the 2017 model year. Regulations on frontal and side collision, ABS, and seat belt reminder will come in effect from the 2020 model year (for new models) and the 2021 model year (for all models).

6.1.2. Emissions

Emissions standards contained in U.S. and European laws (equivalent to Tier 2-Bin 7 and Euro 4) have been fully introduced. Emissions standards for large diesel trucks equivalent to U.S. 2004 or Euro IV regulations have been introduced and are scheduled to be strengthened to US 2010/Euro VI equivalent regulations from 2019.

6.1.3. CO₂ (Fuel Economy)

Since 2014, fuel economy regulations modeled on the US CAFE have been introduced.

6.2. Brazil

6.2.1. Vehicle Safety

The installation of three-point seat belts and head restraints on all seats in passenger vehicles, and of CRS anchorage systems, will become mandatory January 2018.

In all cases, the international standards represented by UN regulations and FMVSS are accepted as alternative performance requirements. Additionally, the installation of ESC will apply starting from new 2020 models.

6.2.2. Emissions

The L7 regulations that strengthen the L6 regulations currently in effect are currently being examined.

6.3. Chile

6.3.1. Vehicle Safety

The vehicle-category-based phase-in of the mandatory installation of airbags on light-duty passenger vehicles has applied to all vehicles since December 2016. A draft proposal to make ABS and ESC mandatory on light-duty passenger vehicles has been submitted to the WTO. An implementation schedule of 24 months after the regulation is issued for ABS on new models, and 36 months for ABS on existing vehicles as well as ESC on all vehicles, is under consideration. In addition, the installation of safety systems such as seat belt, safety glass, and head restraints already mandatory on light-duty vehicles was extended to apply to medium-duty vehicles from January 2016. Only safety glass is currently mandatory for heavy-duty vehicles, but regulations for brakes, seat belts, seats and fuel tanks are under consideration.

6.3.2. Emissions

Emissions standards equivalent to Euro 5 or the U.S. Tier 2-Bin 5 are currently in effect for light-duty diesel and gasoline vehicles. Euro V standards are in effect for heavy-duty vehicles, and moving up to Euro VI standards from 2019 is under consideration. Plans to apply the stricter Euro 6 standards to light-duty vehicles from the latter half of 2020 have been under discussion.

6.3.3. Noise

Acceleration noise standards equivalent to those in the UN R51.02 have been issued for light-duty vehicles. The WTO has been notified of test method encompassing UN R51.03 which, in conjunction with the regulation values, will apply 24 months after being issued. Regulations for heavy-duty vehicles are under consideration.

6.4. Argentina

6.4.1. Vehicle Safety

In addition to the mandatory installation of front airbags and rear side seats head restraints in light-duty passenger and commercial vehicles, ESC will be mandatory on new models starting in 2018. It was decided to make the installation of speed limiters mandatory on heavy-duty vehicles. Implementation is scheduled No-

vember 2016 for M2 and M3, and May 2017 for N2 and N3.

6.4.2. Emissions

Standards equivalent to Euro 5 have been in effect since January 2015 for new light-duty passenger vehicles and since January 2017 for all vehicles. For light-duty commercial vehicles, Euro 5 have been applied since January 2016, and will apply to all vehicles in January 2018. After a one year delay, the implementation of Euro V-equivalent standards to heavy-duty diesel vehicles was applied to new models in January 2016 and will apply to all vehicles in January 2018.

6.5. Columbia

6.5.1. Vehicle Safety

The installation of ABS, airbags and head restraints for light-duty vehicles, and ABS for heavy-duty vehicles, became mandatory as of January 2017. The study of new safety regulations scheduled to apply to light-duty vehicles and buses from January 2020 has begun. For light-duty vehicles, compliance with UN regulations or FMVSS on frontal-, side- and rear-end collisions, seats, and head restraints will be required, while for buses, compliance with UN regulations or FMVSS for the upper structure, seat, seat belt, seat belt anchorage, and flame retardant interior materials and the installation of ESC and automatic fire suppression systems will be made mandatory.

6.5.2. Emissions

Standards equivalent to Euro 2 or Tier 1 are currently in effect for light-duty gasoline vehicles. There are plans to strengthen them to Euro 4 or the U.S. Tier 2 Bin 8, but the schedule for applying those remains undetermined. Standards equivalent to Euro 4 or The U.S. Tier 2 Bin 9 for light-duty diesel vehicles, and to Euro IV or the U.S. 2004 for heavy-duty diesel vehicles, have been in effect since January 2015. Mandating fuel economy labels has also come under consideration.

6.6. Ecuador

6.6.1. Vehicle Safety

The regulation mandating safety systems (RTE INEN 034) was revised and has been enacted since 2015. It mainly introduces UN regulations, but retains some Ecuador-specific requirements. Since October 2016, it has become mandatory to submit documents proving compliance with the each requirement. Even after the certification system began operations, the regulations have frequently been amended, adding alternative regulations

from nations such as Japan, the U.S. or China, and postponing the mandatory installation of ESC on light-duty vehicles to the 2020 model year.

6.6.2. Emissions

Since January 2017, regulations equivalent to Euro 3 or the U.S. Tier 1 have applied to light-duty gasoline (imported) vehicles. Locally produced vehicles benefit from a grace period lasting until September 2017.

6.7. Uruguay

6.7.1. Vehicle Safety

Starting in April 2018, the installation of an anchorage system (ISOFIX or LATCH) allowing a child restraint system to be set on the right side of the rear row of seats of M category vehicles seats will become mandatory.

6.7.2. Emissions

Applying emissions standards equivalent to Euro 4 to passenger vehicles and light-duty commercial vehicles from June 2018 is being examined. The application of mandatory fuel economy labels from January 2018 for passenger vehicles is also under consideration.

6.8. Peru

6.8.1. Emissions

The current standards for light-duty vehicles are Euro 3 or U.S. Tier 1. Application of Euro 4 or U.S. Tier 2 for new and existing gasoline and diesel vehicles is scheduled to start from December 31, 2017. On the same date, Euro IV will apply to heavy-duty vehicles.

6.9. Costa Rica

6.9.1. Emissions

For light-duty vehicles, there are plans to apply standards equivalent to Euro 4 or the U.S. Tier 2 from January 2018, and to Euro 6 or the U.S. Tier 3 from January 2021.

6.9.2. Noise

Since October 2015, stationary noise regulations based on unique limit values and test methods have applied to in-use vehicles.

7 Middle East and Africa

7.1. Gulf Cooperation Council (GCC)

7.1.1. Vehicle Safety

The GSO 42 general safety requirements have undergone a major revision and came into effect from the 2017 model year, but this was subsequently made voluntary for the 2017 model year and compulsory from the 2018 one. Stipulating specific test methods for ESC, tire pres-

sure monitoring systems (TPMS) and brake override in separate regulations is being considered.

7.1.2. Emissions

Although the GSO 42 indicates that emissions regulations will be strengthened to Euro 4 starting with the 2018 model year, the lack of quality improvement in diesel market fuel, has limited that strengthening to Euro 3 for diesel vehicles.

7.1.3. Fuel Economy

Fuel economy labels on light-duty passenger vehicles and light-duty trucks have been mandatory since January 2015 in Saudi Arabia, and starting with the 2017 model year in other GCC countries.

7.2. South Africa

7.2.1. Vehicle Safety

Updates to the current safety regulations based on those of the UN and Europe were under consideration for implementation starting in 2017, but are now likely to be delayed until 2020 or later.

7.2.2. Emissions

Raising the current emissions regulations (Euro 2) to Euro 4 from 2020 for new models and 2022 for existing vehicles is being considered.

New clean fuel regulations (equivalent to Euro 5) were scheduled to apply starting in 2017, but have been postponed due to delays in improving fuel quality. Based on the lead time needed for improvement and repairs, the local petroleum industry is calling for a postponement until around 2023.

7.3. Egypt

The adoption of UN regulations (10 items) started in 2010 (Phase 1). The adoption of the next stage of safety items (Phase 2) that had been set to start on September 16, 2016, were postponed on the grounds of revising the items to adopt. It is not known when it will come into effect after the postponement.

7.4. Morocco

WVTA items or equivalent UN regulations have been adopted since 2010 and applied to all vehicles starting in 2015.

7.5. Algeria

In April 2015, many regulations requiring the installation of safety systems were issued, and approximately 30 items of UN regulations became mandatory. However, regardless of compliance to these regulations, due to factors such as the mandating of local investment by automakers and the imposition of quota system, on vehicle

imports are being restricted by the government.

8 Asia

8.1. China

8.1.1. Vehicle Safety

The GB 7258-2012 Safety specifications for power-driven vehicles operating on roads standard is being revised (e.g., mandatory installation of event drive recorders or radio frequency identification).

8.1.2. Emissions

The China 6 regulations were promulgated for light-duty vehicles. Regulation values will be strengthened in two phases, with China 6a, which is equivalent to Euro 6c, being implemented nationwide from July 2020, and China 6b, which is even stricter than Euro 6c, to be implemented starting in July 2023. The city of Beijing is considering the Beijing 6 (equivalent to the U.S. LEV III), but has yet to issue them and the China 6 regulations are anticipated to come into effect first.

The next emissions regulations (China 6) for heavy-duty vehicles are being considered and are expected to be equivalent to the Euro VI.

8.1.3. Fuel Economy

Since January 2016, both fourth-stage fuel economy (corporate average fuel economy) standards and third-stage individual vehicle fuel economy standards with strengthened target values have been in force for light-duty passenger vehicles. The WTO has been notified of the law on the calculation of passenger vehicle corporate average fuel economy, which stipulates items such as fuel consumption calculation methods, reporting procedures, penalties and credits for new energy vehicles in the fourth-stage fuel economy standards. The quotas for the introduction of new energy vehicles and the timing of their implementation are being reexamined based on the opinions of various countries.

Second-stage regulations have been in effect for heavy-duty vehicles since July 2014. A draft proposal for third-stage fuel economy standards is currently under consideration.

8.1.4. New Energy Vehicles

Promotion of the spread of new energy vehicles is leading to rapid progress in the drafting of new energy-related national standards, and work on drafting and amending standards concerning safety requirements for items such as electric vehicle batteries, motors, charging, and EMC is underway.

8.2. Hong Kong

8.2.1. Vehicle Safety

The adoption of resolutions based on those of the UN for parts such as door latches and hinges, lamps and brakes is an ongoing issue on which little progress is being made.

8.2.2. Emissions

It has been decided to adopt the stricter Euro 6/VI regulations gradually, starting from July 2017 for light-duty vehicles, and from October 2018 for heavy-duty vehicles, with the primary objective of reducing NOx.

8.3. Taiwan

8.3.1. Vehicle Safety

Safety standards based on UN regulations are updated and newly adopted annually. The mandatory installation of daytime running lamps, ESC and BAS, as well as requirements on external protrusion and the identification of control indicators are the upcoming requirements set to gradually apply to new models starting in 2018.

8.3.2. Environmental Protection

A proposal to raise the current Euro 5 emissions regulations to Euro 6 from September 2019 is being discussed with the industry. That proposal also includes in-use performance ratio (IUPR) monitoring requirements, which are not currently in effect.

The corporate average fuel CO₂ regulations that had just come into effect with units sold in 2016 were suspended on the grounds of having achieved the initial targets. However, corporate average fuel economy regulations are being implemented as planned, and a proposal to make average target values 45% stricter in 2022 has been announced.

In terms of future vehicle exterior noise, the gradual adoption of regulations equivalent to UN R51.03 from July 2018 is under consideration.

8.4. Thailand

8.4.1. Vehicle Safety

The Thai Industrial Standard Institute (TISI) and Department of Land Transport (DLT) are sharing the work of harmonizing standards with UN regulations and applying new regulations.

For passenger vehicles, the DLT has decided to adopt UN R43 (glass) as of January 2018, as well as UN R28 (warning devices) and UN 51 (noise) as of January 2019. The gradual introduction of other UN regulations is also being examined.

For its part, TISI has decided to apply UN R30 (pas-

senger vehicle tires), UN 54 (commercial vehicle tires) as of January 2018, and UN R117 (tire noise) as of January 2022.

8.4.2. Emissions

Euro 4 regulations have been in effect for light-duty vehicles since December 2012, while Euro III regulations have been in force for heavy-duty diesel vehicles since March 2013. The strengthening of emissions regulations for both light- and heavy-duty vehicles is under consideration.

8.5. Malaysia

Since joining the 1958 Agreement in 2006, Malaysia has been actively making the application of UN regulations mandatory, with approximately 30 UN regulations for items such as seat belts, brakes, and collisions becoming mandatory as of January 2012.

The Malaysian Ministry of Transport is considering making ESC mandatory from June 2018, and eCall (automatic emergency notification system) mandatory from January 2019.

Preparations are underway for almost all UN regulations, including the latest standards such as pedestrian protection for light-duty vehicles or emergency braking systems in heavy-duty vehicles, as well as cab strength requirements, to become mandatory by 2020.

8.6. Indonesia

Phase 1 of the ASEAN Mutual Recognition Agreement (MRA), which involves integrating UN regulations in the national standards, is being studied. There are plans to introduce Euro 4/IV regulations in 2018 or later, but the prerequisite of making market fuel compliant with those regulations available nationwide makes the timing of that introduction unclear.

8.7. Singapore

The Euro 4 emissions regulations have been in effect since April 2014 for gasoline vehicles (excluding the Type 6 low-temperature test), and the Euro 5/V regulations were introduced in January 2014 for diesel vehicles. The introduction of Euro 6/VI regulations starting in September 2017 for gasoline vehicles and January 2018 for diesel vehicles as the next regulations has been announced.

8.8. India

8.8.1. Vehicle Safety

The Indian Standards (IS) and Automotive Industry Standards (AIS) sets of technical standards are gradually being harmonized with UN regulations. Work on building

the infrastructure for certification tests such as collision safety testing, pedestrian protection, and electromagnetic interference is moving forward. In conjunction with the completion of those facilities, new models will be subject to the standards on the protection of occupants in the event of the steering mechanism moving back in a frontal collision (AIS 096), in the event of an offset frontal collision (AIS 098), or in the event of a lateral collision (AIS 099) starting in October 2017, and to the standard for the protection of pedestrians (AIS 100) in October 2018. The Indian Ministry of Road Transport and Highways (MoRTH) has decided to mandate the installation of ABS on new passenger vehicles from April 2018.

8.8.2. Emissions

The application of the Bharat Stage (BS) IV (equivalent to Euro 4/IV) regulations was expanded to all cities in 2017. In February 2016, the Indian government decided to skip over the BS V (equivalent to Euro 5/V) and apply BS VI (equivalent to Euro 6/VI) to new models starting in April 2020.

8.8.3. Fuel Economy

The Indian government has decided to introduce of the corporate average fuel economy regulations applying to light-duty passenger vehicles as of April 1, 2017. Also, the Bureau of Energy Efficiency (BEE) is considering making the originally optional application of fuel economy labels mandatory.

8.9. Vietnam

8.9.1. Vehicle Safety

Starting mainly with standards for parts such as vehicle glass, mirrors, tires, lighting devices, fuel tanks and aluminum wheels, the gradual application of UN regulations is moving forward.

8.9.2. Environmental Protection

The Euro 4/IV emissions regulations were introduced in January 2017. A recycling law aimed at the recovery of waste products (Decision No. 16/2015/QD-TTg) was enacted, with its scope extending to parts such as batteries, tires and air conditions as of July 2016 and scheduled to apply to the entire vehicle as of January 2018.

8.10. The Philippines

The three-point seat belt, airbag (driver and passenger seats), head restraint (outer seat) and ABS safety systems were made mandatory for passenger vehicles in March 2016, and regulatory items for a further tightening of safety restrictions starting in 2018 are being considered. Euro4/IV exhaust emission standards (excluding

OBD requirements) were enforced from January 2016 on all vehicles.

8.11. Brunei

The three-point seat belt, airbag (driver and passenger seats), head restraint (outer seat) and ABS safety systems have been mandated for passenger vehicles since March 2016. Additional requirements such as seat belt warnings, ISOFIX anchors, side and curtain airbags and ESC are under consideration.

8.12. Cambodia

The adoption of 19 UN regulations, including UN R13 (brakes), UN R14 (seat belt anchorage), from January 2017 was announced in the context of the ASEAN Mutual Recognition Agreement (MRA).

9 Oceania

9.1. Australia

9.1.1. Vehicle Safety

The individual Australian Design Rules (ADR), including their unique requirements, are being reviewed in line with a policy of adopting UN regulations. After the revision, compliance certification for the technical requirements in UN regulations cited in the ADR, or for subsequently issued UN regulations up to the latest version, will be recognized.

9.1.2. Emissions

The Euro 5 emissions regulations stipulated in ADR79/04 have been applied to all light-duty gasoline vehicles starting in November 2016. The Euro V regulations already applied to all heavy-duty vehicles since January 2011, and both the U.S. 2007 regulations and Japanese 2005 regulations (new long-term regulations) are recognized as alternative standards. A Ministerial Forum established by the Australian Government is taking a whole-of-government approach to studying the next emissions regulations, but progress is slow due to the bottleneck caused by the need to improve market fuel quality.

9.2. New Zealand

Vehicles that are manufactured in Japan (complying with Japanese technical standards and the like), Europe (EC/UN regulations), the U.S. (FMVSS), and Australia (ADR) are accepted.

10 Motorcycles

10.1. Japan

10.1.1. Vehicle Safety

Electromagnetic compatibility (UN R10) has applied to both new models and existing models since August 2016. Lighting devices (UN R50) and Headlamps emitting a symmetrical passing beam (UN R113) were adopted in June 2015 and will apply to new models and existing models starting in June 2020, but the period for Installation of lighting devices (UN R53) has not been determined. Control/tell-tales (UN R60) will apply to both new models and existing models from July 2017. In addition, ABS/CBS will be mandatory as of October 2018 for new models, and October 2021 for existing models.

10.1.2. Emissions

The third phase of emissions regulations equivalent to Euro 4 apply to new models in October 2016, and to existing models in September 2017, with evaporative emissions and OBD regulations coming into effect at the same time.

10.1.3. Noise

Motorcycle noise regulations (UN R41.04) were applied from January 2014 for new models, and January 2017 for existing models. Relative limit values were stipulated for proximity stationary exhaust noise, coming into effect from October 2016 for new models and from September 2021 for existing models.

10.2. The U.S.

10.2.1. Vehicle Safety

There were no significant changes in the laws or regulations.

10.2.2. Emissions

The emissions regulations of the EPA were strengthened in the past to establish a Class III HC+NO_x regulation value of 0.8 g/km from the 2010 model year. There have been no subsequent other moves to further strengthen the regulations. For greenhouse gases, coefficients can be reported up to the 2017 model year, and the use of coefficients for the 2018 and later model years, is being considered. The new CARB evaporative emissions regulation value and test method for off-road motorcycles and ATVs starting with the 2018 model year, and to all existing models up to the 2021 model year.

10.3. Canada

There were no significant changes in the laws or regulations, and standards are being harmonized with those

of the U.S.

10. 4. Europe

Regulations for a new uniform European vehicle type approval system were completed in 2014 and came into effect in January 2016 for motorcycles, and in January 2017 for mopeds. The three delegated and implementing acts concerning the environment, functional safety, and vehicle structure were passed in July 2016 and came into effect in October 2016.

10. 4. 1. Vehicle Safety

It was made mandatory for vehicles in the L3e category (two-wheeled motorcycles) to be equipped with an ABS and have either an automatic daytime running light system, or an automatic headlight on system when the ignition is switched on. In addition, L3e-A1 category vehicles (low-performance motorcycles below 125 cc) must now be equipped with ABS, CBS, or both. Detailed technical requirements on aspects such as the electrical safety of electric powered vehicles are also applied as a deterrent to modifying such vehicles. New requirements on steer-ability, cornering properties and turn-ability were added.

10. 4. 2. Emissions

Euro 4 regulations were applied to new models in starting 2016, and to existing models in 2017. Crankcase emissions, evaporative emissions, durability, and OBD requirements for the have been incorporated into the regulations in addition to mode emission test. Euro 4 for the L1e category (mopeds), which is exempted from OBD and evaporative emissions, will apply to new models in starting 2017, and to existing models in 2018. The European Commission will finish examining the period and details of Euro 5 and preparing the regulations by 2016, which are currently planned to apply to new models in 2020 and to existing models in 2021.

10. 4. 3. Noise

For L3e category vehicles, UN R41.04 was applied to new models in starting 2016, and starts applying to existing models in 2017. It will apply to the L1e and L2e (three-wheeled mopeds) categories in 2017 for new models and in 2018 for existing models.

10. 4. 4. Technical Information for Repair and Maintenance

It was stipulated that automakers must maintain websites through which information on OBD as well as vehicle repair and maintenance can be obtained.

10. 5. Central and South America

10. 5. 1 Brazil

The date for the legislation making it mandatory for vehicles to be equipped with anti-theft devices to go into effect was postponed indefinitely. The gradual application of advanced ABS/CBS systems started in 2016, and will reach 100% in 2019.

The Second-stage PROMOT4 fuel emissions regulations (which add stricter regulation values and evaporative emissions requirements) will apply to both new models and existing models as of January 2016.

The noise regulations are currently equivalent to those in UN R41.03, but authorities are examining whether to strengthen these for equivalence with UN R41.04.

10. 5. 2. Peru

The Euro 3 emissions regulations were applied as of January 1, 2017.

10. 7. Asia

10. 7. 1. Taiwan

The installation of ABS or CBS will become mandatory in January 2019 for new models and January 2021 for existing models. The installation of automatic headlight on system or daytime running lamps is also going to become mandatory in January 2017 for new models and January 2019 for existing models.

Sixth-generation emissions regulations (equivalent to Euro 4) came into effect in January 2017 for new models and will apply to existing models from January 2018. The fifth-generation fuel economy regulations for the WMTC test cycle were introduced in January 2017.

Sixth-generation noise regulations (equivalent to UN R41.04) came into effect in January 2017 for new models and will apply to existing models from January 2018. Unique regulations will apply for proximity stationary exhaust noise.

10. 7. 2. Indonesia

Emissions regulations equivalent to Euro 3 and alternative regulations that use the WMTC test cycle were added. These have applied to new models since August 2013, and to existing models since August 2015.

10. 7. 3. Malaysia

In terms of safety, the regulations on electromagnetic compatibility (UN R10), filament lamps (UN R37), and controls/tell-tales (UN R60) were applied to new models from January 2015 and to existing models from January 2017.

The Euro 3 emissions regulations and UN R41.03 noise

regulations came into effect in January 2016 for new models and in January 2017 for existing models. The UN R41.04 and regulations equivalent to Euro 4 are also under consideration as the next regulations to be applied to new models from January 2020 and existing models from January 2022.

10.7.4. The Philippines

Examinations are underway to harmonize ASEAN standards and apply UN regulations. The incorporation of UN regulations for horns (UN R28), tires (UN R75), speedometers (UN R39), and other safety-related standards is being considered.

Emissions regulations equivalent to Euro 3 came into force for new models in September 2015, and the application of regulations equivalent to Euro 4 as the next generation of regulations is under consideration.

The application of the UN R41.03 noise regulation to new models from 2018 and to existing models from 2020 is being studied.

10.7.5. India

In terms of safety, regulations on electromagnetic compatibility amended to be equivalent to UN R10.03 came into effect in October 2013 for new models and in October 2015 for existing models. In addition, the installation of ABS/CBS will become mandatory in April 2018 for new models and April 2019 for existing models, and the mandatory installation of automatic headlight on system or daytime running lamps is effective as of April 2017.

The Bharat Stage (BS) 4 emissions regulations, including the application of evaporative emissions requirements, came into effect in April 2016 for new models and in April 2017 for existing models. For the next regulations, BS 5 will be skipped and the BS 6 emissions regulations, equivalent to Euro 5, will apply to vehicles produced in April 2020 and later, at the same time as the OBD Stage I requirements will come into effect. Moreover, the OBD Stage II requirements will apply from April 2023.

10.7.6. Vietnam

Emissions regulations equivalent to Euro 3 have applied to all vehicles since January 2017, and fuel economy regulations are under consideration.

10.7.7. Thailand

A safety regulation on horns (equivalent to UN R28.00) will come into effect in January 2018 for new models and

January 2020 for existing models.

Although sixth-generation emissions regulations equivalent to Euro 3 are in effect, the use of the WMTC test cycle is not recognized. The introduction of seventh-generation Euro 4 equivalent emissions regulations from 2018 as the next-generation regulations is under examination.

Noise regulations equivalent to UN R41.03 are in effect, and regulations equivalent to R41.04 are under consideration as the next regulations to be applied to new models from 2018 and to existing models from 2020.

10.7.8. China

In terms of safety, the mandatory installation of ABS/CBS is under consideration.

The China 4 (equivalent to Euro 4) emissions regulations will apply to new models as of July 1, 2018, and their application to all vehicles will become mandatory as of July 1, 2019.

The application of amendments to the noise regulations (equivalent to UN R41.04) and the strengthening of fuel economy regulations at the same time as the China IV emissions regulations is under consideration.

10.7.9. Hong Kong

Revising the emissions regulations to the equivalent of Euro 4 is being examined.

10.7.10. Singapore

Revising the emissions regulations to the equivalent of Euro 4 is being examined.

10.7.11. South Korea

The Euro 4 emissions regulations are effective as of January 1, 2017. In addition, Euro 5 is being considered for the next-generation regulations to apply as of January 1, 2020.

10.7. Oceania

10.7.1. Australia

In September 2014, the wheel guard requirements in ADR42/04 – General Safety Requirements were revised. Also, ADR43/04 – Vehicle Configuration and Dimensions and ADR57/00 – Special Requirements for L-Group Vehicles were amended in November 2015, and the overall maximum width of vehicles was revised to 1,100 mm. The mandatory installation of ABS is currently being examined.

There were no significant changes in laws and regulations concerning either emissions or noise.