

IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF MICHIGAN

)	
JAGUAR LAND ROVER LIMITED,)	Civil Action No.
)	
Plaintiff,)	
)	
v.)	
)	
MANDO CORPORATION, and)	JURY TRIAL DEMANDED
MANDO AMERICA CORPORATION,)	
)	
Defendants.)	
)	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff, Jaguar Land Rover Limited (“JLR”), by and through their undersigned counsel, hereby bring this Complaint to protect JLR’s patented and award-winning Hill Descent Control (“HDC[®]”) and Electronic Traction Control (“ETC”) technologies from infringement by Defendants Mando Corporation and Mando America Corporation (collectively “Mando” or “Defendants”). JLR alleges as follows:

NATURE OF THE ACTION

1. This is a civil action for infringement. This action is based upon the patent laws of the United States, 35 U.S.C. § 1 *et seq.*

THE PARTIES

2. Plaintiff JLR is incorporated and registered in England and Wales, having a principal place of business at Abbey Road, Whitley, Coventry, CV3 4LF, England.

3. On information and belief, Mando Corporation is organized and existing under the laws of Republic of Korea having a principal place of business at 32, Hamanho-gil, Poseung-eup, Pyeongtaek-si, Gyeonggi-do, South Korea.

4. On information and belief, Mando America Corporation is organized and existing under the laws of the State of Michigan having a principal place of business at 29930 Hudson Drive, Novi, Michigan 48377.

JURISDICTION AND VENUE

5. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a) because this action arises under the Patent Laws of the United States, Title 35, United States Code, including 35 U.S.C. § 271 *et seq.*

6. This court has personal jurisdiction over Defendants by virtue of the activities Defendants conduct within the State of Michigan. On information and belief, Mando America Corporation is organized and existing under the laws of the State of Michigan and has a principal place of business at 29930 Hudson Drive, Novi, MI, 48377. Mando Corporation, directly or through subsidiaries manufactures, uses, sells, or offers to sell its products within the State of Michigan.

Defendants conduct continuous and systematic parts of their business within the State.

7. Venue is proper in this District pursuant to 28 U.S.C. §§ 1331, 1338(a), 1391(b), (c) and (d) and 1400(b).

THE ASSERTED PATENTS

8. On August 24, 1999, the PTO, after full and fair examination, duly and legally issued U.S. Patent No. 5,941,614 (“the ’614 patent”) entitled “Wheeled Vehicle.” JLR holds all right, title, and interest in the ’614 patent with full rights to enforce the ’614 patent and sue and recover for past, present, and future infringement. A true and correct copy of the ’614 patent is attached as Exhibit A.

9. On February 27, 2001, the PTO, after full and fair examination, duly and legally issued U.S. Patent No. 6,193,333 (“the ’333 patent”), entitled “Vehicle Brake Control.” JLR holds all right, title, and interest in the ’333 patent with full rights to enforce the ’333 patent and sue and recover for past, present, and future infringement. A true and correct copy of the ’333 patent is attached as Exhibit B.

10. On June 5, 2001, the PTO, after full and fair examination, duly and legally issued U.S. Patent No. 6,243,640 (“the ’640 patent”), entitled “Vehicle Brake Control.” JLR holds all right, title, and interest in the ’640 patent with full rights to enforce the ’640 patent and sue and recover for past, present, and future infringement. A true and correct copy of the ’640 patent is attached as Exhibit C.

11. On June 29, 2004, the PTO, after full and fair examination, duly and legally issued U.S. Patent No. 6,755,488 (“the ’488 patent”), entitled “Traction Control System.” JLR holds all right, title, and interest in the ’488 patent with full rights to enforce the ’488 patent and sue and recover for past, present, and future infringement. A true and correct copy of the ’488 patent is attached as Exhibit D.

12. The ’614, ’333, ’640, and ’488 patents are collectively referred to herein as “the Asserted Patents.”

13. Mando has been on notice of the ’614, ’333, and ’640 patents since at least March 24, 2014. In a March 24, 2014 letter from JLR to Mando, JLR identified certain vehicles having a hill descent control feature and Mando brake systems, and alleged that the Mando brake systems infringed one or more of the ’614, ’333, and ’640 patents. A true and correct copy of the March 24, 2014 letter from JLR to Mando is attached as Exhibit E.

JLR’S PATENTED ELECTRONIC TRACTION CONTROL (“ETC”) AND HILL DESCENT CONTROL (“HDC[®]”) TECHNOLOGIES

14. For over sixty years, JLR has manufactured and sold some of the most innovative and technologically advanced four-wheel drive vehicles in the world. This rich history of innovation continues today and is reflected in JLR’s current line-up of award winning vehicles: Discovery Sport, LR4, Range Rover Evoque, Range Rover Sport, and The Range Rover.

15. Among the groundbreaking technologies in these vehicles are JLR's patented Electronic Traction Control ("ETC") and Hill Descent Control ("HDC[®]") technologies.

16. JLR's ETC technology electronically controls a vehicle's brake system and engine speed by monitoring wheel speed, engine torque demand, and engine torque output to simultaneously prevent the vehicle's wheels from spinning and its engine from stalling. When the system detects wheel spin, it applies the brakes to equalize rotational speed of the wheels. Unlike standard traction control systems, JLR's patented technology also monitors engine torque output and demand, and applies the brakes to achieve maximum torque output. As a result, JLR's ETC technology avoids engine stall—a common situation with standard traction control systems.

17. JLR's HDC[®] technology allows a vehicle to descend hills at a controlled speed without driver intervention by maintaining a constant speed and applying braking separately to each wheel during descents of difficult slopes.

18. Before the introduction of HDC[®], a driver approaching a steep hill in rough terrain would put the car in first gear in the low-range and then descend the hill without using any pedals, using the engine as a brake. Paul Beever, *Hill Descent Control: A Braking Revolution*, Landrover.co.uk, (May 11, 2015), available at <https://live.landrover.co.uk/technology/land-rover-hill-descent->

control-revolutionised-braking-technology. In places where the hill was particularly steep or road conditions particularly poor, engine braking might be insufficient and the driver might still need to use the brakes. With HDC[®], a car can make a controlled descent of a steep, off-road hill without skilled inputs from the driver. Instead, the HDC[®] system automatically slows vehicles on steep hills, which improves both safety and control. *Land Rover Celebrates Queens Awards for Enterprise Success*, AM Online (Apr. 21, 2001), available at <http://www.am-online.com/news/2001/4/21/land-rover-celebrates-queens-awards-for-enterprise-success/1490/>.

19. JLR's HDC[®] technology has received significant recognition in the automotive industry. For example, in 2001, HDC[®] won the prestigious Queen's Award for Innovation. *Land Rover Wins Two Queen's Enterprise Awards*, Automotive Intelligence News (Apr. 25, 2001), available at <http://www.autointell.com/News-2001/April-2001/April-25-01-p4.htm>.

20. JLR's ETC and HDC[®] technologies are included as standard features across several of JLR's vehicles. ETC technology, as disclosed in the '488 patent, was available as a standard feature in the LR2 and Range Rover Evoque through 2014. HDC[®] is a standard feature on the Discovery Sport, LR4, LR2, Range Rover Sport, Range Rover Evoque, and Range Rover, and was also standard on the LR2 through 2014.

MANDO'S TRACTION CONTROL AND DOWNHILL BRAKE CONTROL SYSTEMS

21. Mando manufactures Traction Control Systems (“TCS”). Like JLR’s ETC technology, Mando’s TCS is designed to detect wheel spin during acceleration. Mando’s TCS uses both engine power and brake force to transfer power to wheels that need increased traction. This results in both increased control and traction for the vehicle. *See, e.g., Kia Sorento 2016 Safety Features*, Kia, <http://www.kia.com/us/en/vehicle/sorento/2016/features> (last visited Apr. 28, 2016) (“The advanced Traction Control System (TCS) can sense wheel spin during acceleration. Using a combination of engine power and brake force, power is transferred to the wheels that have the most traction offering increased control and traction.”).

22. On information and belief, Mando supplies its TCS to vehicle manufacturers, including Kia. The Mando TCS can be found as a standard safety feature in the Kia Sorento.

23. Mando also manufactures Downhill Brake Control (“DBC”) systems. Like JLR’s HDC[®] technology, Mando’s DBC is designed to assist drivers in downhill driving. When descending a steep hill, the DBC slows the vehicle automatically, without the driver pressing the brake pedal, enabling the driver to focus on steering the vehicle. *Downhill Brake Control (DBC)*, Hyundai Santa Fe

Owner's Manual, http://www.hyundaisantafemanual.com/santafe-204-downhill_brake_control dbc_.html (last visited Apr. 28, 2016).

24. On information and belief, Mando supplies its DBC systems to vehicle manufacturers including Hyundai and Kia. Mando's accused DBC systems are included as standard safety features on the Hyundai Santa Fe and Kia Sportage sports utility vehicle ("SUV") models. *See, e.g., 2017 Sante Fe: Features & Specifications*, Hyundai, <https://www.hyundaiusa.com/santa-fe/specifications.aspx> (last visited Apr. 28, 2016); *Sportage 2017 Features & Specs, Safety*, Kia, <http://www.kia.com/us/en/vehicle/sportage/2017/features> (last visited Apr. 28, 2016); *2016 Sportage Brochure*, Kia, http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwi38r_Au9fLAhWBdx4KHZBqDaMQFggcMAA&url=http%3A%2F%2Fwww.kia.com%2Fus%2Fk3%2Fcontent%2Fmedia%2Fall%2Fvehicles%2Fsportage%2Fbrochures%2Fbrochure_sportage_2016.pdf&usg=AFQjCNHnsMiAwpJT5EyBbF0Jv44v7sIIA_ (last visited Apr. 28, 2016).

25. Mando's TCS and DBC systems each infringe one or more of the Asserted Patents, either literally or under the doctrine of equivalents. Mando's manufacture, use, sale, offer for sale, and/or importation of these infringing products has damaged and will continue to damage JLR, causing irreparable harm,

for which there is no adequate remedy at law, unless Mando's wrongful acts are enjoined by this Court.

CLAIMS FOR RELIEF

26. The allegations in the following Claims For Relief have evidentiary support or will likely have evidentiary support after a reasonable opportunity for further investigation or discovery. Plaintiff does not yet have the benefit of any discovery from Mando.

27. The Court has not construed the meaning of any claims or terms in the Asserted Patents. In providing these detailed allegations, Plaintiff does not intend to convey or imply any particular claim constructions or the precise scope of the claims. Plaintiff's claim construction contentions regarding the full meaning and scope of the claim terms will be provided in compliance with the case schedule and any applicable orders.

28. Plaintiff contends that Mando directly infringes the asserted claims.

29. Plaintiff further contends that each element of each asserted claim of the Asserted Patents is literally present in Mando's accused TCS and DBC products. If the Court's constructions or other determinations indicate that an element of an asserted claim is not literally present, Plaintiff contends that each such element is present under the doctrine of equivalents. If necessary, Plaintiff

will provide more detailed doctrine of equivalents contentions after discovery from Mando or a claim construction order by the Court.

COUNT ONE — INFRINGEMENT OF THE '614 PATENT

30. JLR repeats and realleges the allegations of Paragraphs 1 through 29 above as if fully set forth herein.

31. Mando has directly infringed and continues to infringe at least claim 16 of the '614 patent by making, using, offering for sale within the United States and/or importing into the United States its DBC systems.

32. Claim 16 of the '614 patent discloses:

16. A brake control system for a wheeled vehicle having a plurality of wheels, a plurality of braking means each for braking one of said wheels, wheel lock detection means for detecting locking of any of said wheels and vehicle speed detection means for detecting the speed of the vehicle, the system comprising control means which has an activated state and a de-activated state;


wherein in the activated state the control means is arranged to apply each braking means to slow the vehicle when a detected vehicle speed is above a predetermined target speed and wheel locking is undetected, to release any of the braking means if locking of its respective wheel is detected while the detected vehicle speed is above said target speed, and to control a rate of change of speed of the vehicle towards the target speed if the vehicle speed is substantially different from the target speed.

33. On information and belief, Mando's DBC satisfies all of the limitations of claim 16 of the '614 patent.

34. Claim 16 of the '614 patent recites: “A brake control system for a wheeled vehicle having a plurality of wheels, . . .” Mando’s DBC is designed to be incorporated into vehicles that have a plurality of wheels.

35. Claim 16 of the '614 patent further recites that the vehicle has “a plurality of braking means each for braking one of said wheels, . . .” Mando’s DBC is incorporated into vehicles that have a plurality of brakes each for braking one of the vehicle’s wheels, where the brakes are the same as or equivalent to the structures described in the '614 patent specification and drawings for performing the function of braking the vehicle’s wheels.

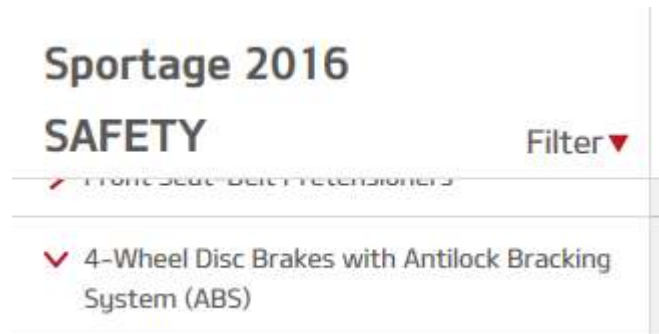
36. For example, the Hyundai Santa Fe has four-wheel disc brakes, an Anti-Lock Braking System (“ABS”) with Electronic Brake-force Distribution (“EDB”) and Brake Assist (“BA”). *See, e.g., 2017 Santa Fe: Features & Specifications*, Hyundai, <https://www.hyundaiusa.com/santa-fe/specifications.aspx> (last visited Apr. 28, 2016).

 Santa Fe Gallery Exterior Interior Performance	
SE \$30,800 MSRP	
VIEW DIFFERENCES ONLY + EXPAND ALL	
4-wheel, 4-channel Anti-lock Braking System (ABS) with Electronic Brake-force Distribution (EBD) and Brake Assist (BA)	Standard
Downhill Brake Control (DBC)	Standard

See also, Hyundai Santa Fe Returns In 2014 With New Safety Technologies And Premium Comfort Features For The Whole Family (“Santa Fe also features a state-of-the-art braking package. The package includes four-wheel disc brakes (12.6 inch front and 11.9 inch rear), an Anti-Lock Braking System (ABS) including Brake Assist providing maximum braking force when a panic stop is detected, and Electronic Brake-force Distribution (EBD) to automatically adjust the braking force to front and rear axles, based on vehicle loading conditions.”) (<http://hyundainews.com/us/en-us/Media/PressRelease.aspx?mediaid=39207>); *id.* (“All 2014 Santa Fe trims feature Hyundai’s Hillstart Assist Control (HAC) and Downhill Brake Control (DBC) to maximize control on steep hills. HAC minimizes rolling backwards on steep ascents, while DBC helps the driver maintain vehicle control and speed on steep downhill descents. By selecting the DBC switch, the Hydro-Electronic Control unit manages the wheel speed sensors, steering angle sensor and acceleration sensor to maintain control and speed on steep declines without having to use the brake.”); *Hyundai Santa Fe Owner’s Manual*, at Section 5, page 28 (“Your vehicle has power-assisted brakes that adjust automatically through normal usage.”).

37. Similarly, the Kia Sportage, which also incorporates Mando’s DBC, has “4-Wheel Disk Brakes with Antilock Braking System (ABS).” *See, e.g., Kia Sportage 2016 Features & Specs: Safety*, Kia,

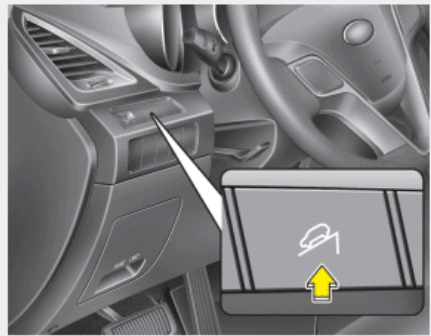
<http://www.kia.com/us/en/vehicle/sportage/2016/features> (last visited Apr. 28, 2016).



38. Claim 16 of the '614 patent further recites that the vehicle containing the brake system has “wheel lock detection means for detecting locking of any of said wheels and vehicle speed detection means for detecting the speed of the vehicle, . . .” Vehicles utilizing Mando’s DBC have both wheel lock detection means that detect locking of any of the vehicle’s wheels and vehicle speed detection means for detecting the speed of the vehicle, where the wheel lock detection means and vehicle speed detection means have structures that are the same as or equivalent to the structures described in the '614 patent specification and drawings for performing the respective functions of “detecting locking of any of said wheels” and “detecting the speed of the vehicle.” *See, e.g.*, Hyundai Santa Fe Owner’s Manual, at Section 5, page 33 (“The ABS continuously senses the speed of the wheels. If the wheels are going to lock, the ABS system repeatedly modulates the hydraulic brake pressure to the wheels.”)

39. Claim 16 of the '614 patent further recites “the system comprising control means which has an activated state and a de-activated state . . .” The Mando DBC is operated by a brake system controller, and the DBC can be turned on and off at the push of a button. Thus, the Mando DBC’s controller has both an activated (on) and de-activated (off) state. When the Mando DBC is turned on, it operates consistent with the “activated state” as described in the rest of claim 16. *See, e.g.*, Press Release, Hyundai Santa Fe Returns in 2014 with New Safety Technologies and Premium Comfort Features for the Whole Family, Hyundai (Oct. 1, 2013), available at https://www.hyundaiusa.com/about-hyundai/news/corporate_hyundai_santa_fe_returns_in_2014_with_new_safety_technologies_and_premium_comfort_features-20131001.aspx (“[b]y selecting the DBC switch, the Hydro-Electronic Control unit manages the wheel speed sensors, steering angle sensor and acceleration sensor to maintain control and speed on steep declines”); Hyundai Santa Fe Owner’s Manual, at Section 5, pages 40–41 (“DBC defaults to the OFF position whenever the ignition is turned on. The DBC can be turned on or off by pushing the button.”); *Downhill Brake Control (DBC)*, Hyundai Santa Fe Owner’s Manual, http://www.hyundaisantafemanual.com/santafe-204-downhill_brake_control_dbc_.html (last visited Apr. 28, 2016). The Mando DBC’s

brake system controller is the same as or is equivalent to the structure described in the patent specification and drawings for performing the control function.



Mode	Indicator light	Description
Standby	Green light illuminated	Press the DBC button when the vehicle speed is under 25 mph (40 km/h). The DBC system will turn ON and enter the standby mode. The system maintains the standby mode when vehicle speed is under approximately 38 mph (60km/h).
Activated	Green light blink	In the standby mode, DBC will activate automatically under the following conditions: <ul style="list-style-type: none"> • The incline is over a certain degree. • The brake pedal or accelerator pedal is not depressed.
OFF	Green light OFF	The DBC will turn OFF under the following conditions: <ul style="list-style-type: none"> • The DBC button is pressed again. • The vehicle speed is over approximately 38 mph (60 km/h).
Temporarily deactivated	Green light illuminated	In the activated mode, the DBC will temporarily deactivate under the following conditions: <ul style="list-style-type: none"> • The hill is not steep enough. • The brake pedal or accelerator pedal is depressed. When the above conditions are gone, the DBC will automatically activate again.

40. Claim 16 of the '614 patent recites “wherein in the activated state the control means is arranged to apply each braking means to slow the vehicle when a detected vehicle speed is above a predetermined target speed and wheel locking is undetected, . . .” Mando’s DBC satisfies this limitation, and has a brake system controller that is the same as or equivalent to the structure described in the patent specification and drawings for performing the function of “apply[ing] each braking means to slow the vehicle when a detected vehicle speed is above a predetermined target speed and wheel locking is undetected.”. When the Mando DBC is turned on, it applies the car’s brakes to slow the vehicle when the detected speed is above the predetermined target speed. *See, e.g.*, 2011 Kia Sportage Button Panel, York Kia of Medford (Sept. 17, 2010), *available at* <https://www.youtube.com/watch?v=Ko8aZldFe2U> (screen shot captured from YouTube video).



See also Press Release, Hyundai Santa Fe Returns in 2014 with New Safety Technologies and Premium Comfort Features for the Whole Family, Hyundai (Oct. 1, 2013), available at https://www.hyundaiusa.com/about-hyundai/news/corporate_hyundai_santa_fe_returns_in_2014_with_new_safety_technologies_and_premium_comfort_features-20131001.aspx (“[b]y selecting the DBC switch, the Hydro-Electronic Control unit manages the wheel speed sensors, steering angle sensor and acceleration sensor to maintain control and speed on steep declines”); Kif Richmann, *Kia Sorento Makes a Great Winter Vehicle*, McGrath Kia (Dec. 11, 2012), available at <http://blog.mcgrathkia.com/kia-sorento-makes-a-great-winter-vehicle/> (“Equipped with Hill Decent Control, the Kia Sorento engages the appropriate anti-lock brake to maintain 5 mph throughout the downhill trip, allowing you to focus on steering. The brake system also detects when individual wheels begin to skid, helping you maintain control and reduce stopping distance.”); *Downhill Brake Control (DBC)*, Hyundai Santa Fe Owner’s

Manual, http://www.hyundaisantafemanual.com/santafe-204-downhill_brake_control_dbc_.html (last visited Apr. 28, 2016) (“The Downhill Brake Control (DBC) assists the driver when descending a steep hill without the driver depressing the brake pedal. It slows the vehicle to under approximately 6.3 mph (10 km/h) and lets the driver concentrate on steering the vehicle.”).

41. Claim 16 of the '614 patent further recites that the control means in an activated state will “release any of the braking means if locking of its respective wheel is detected while the detected vehicle speed is above said target speed, . . .” In the activated state, the Mando DBC’s controller releases the braking means if locking of its respective wheel is detected while the detected vehicle speed is above said target speed. Mando’s brake system controller is the same as or equivalent to the structure described in the '614 patent specification and drawings for performing the function of “releas[ing] any of the braking means if locking of its respective wheel is detected while the detected vehicle speed is above said target speed.” *See, e.g.*, Hyundai Santa Fe Owner’s Manual, at Section 5, page 33 (“The ABS continuously senses the speed of the wheels. If the wheels are going to lock, the ABS system repeatedly modulates the hydraulic brake pressure to the wheels.”).

42. Claim 16 of the '614 patent further recites that the control means in an activated state will “control a rate of change of speed of the vehicle towards the

target speed if the vehicle speed is substantially different from the target speed.” In the activated state, the Mando DBC’s brake system controller satisfies this limitation because it “offers peace of mind when descending steep grades by automatically engaging the Anti-lock Braking System (ABS) to maintain a steady descent speed of up to 5 mph . . .,” thereby controlling the rate of change of speed of the vehicle towards the target speed if the vehicle speed is substantially different from the target speed. *Sportage 2017 Features & Specs, Safety*, Kia, <http://www.kia.com/us/en/vehicle/sportage/2017/features> (last visited Apr. 28, 2016). The “steady descent” of the vehicle while the Mando DBC is in use matches the claimed controlled “rate of change of speed” in the ’614 patent. Mando’s brake system controller is the same as or equivalent to the structure described in the ’614 patent specification and drawings for performing the function of “control[ling] a rate of change of speed of the vehicle towards the target speed if the vehicle speed is substantially different from the target speed.”



43. As described in the preceding paragraphs, each limitation of claim 16 of the '614 patent is met by the accused Mando DBC, either literally or under the doctrine of equivalents.

44. Mando has infringed and continues to infringe the '614 patent by making, using, selling, offering for sale, and/or importing into the United States the Mando DBC covered by one or more claims of the '614 patent. Mando is liable to JLR for infringement of the '614 patent pursuant to 35 U.S.C. § 271(a).

45. Mando has been on notice of the '614 patent and the Mando brake systems accused of infringing the '614 patent since at least March 24, 2014. Mando's infringement of the '614 patent has been and is willful and deliberate, entitling JLR to enhanced damages pursuant to 35 U.S.C. § 284 and recovery of attorneys' fees and costs pursuant to 35 U.S.C. § 285.

46. Mando's infringement of the '614 patent will continue to damage JLR's business, causing irreparable harm, for which there is no adequate remedy at law, unless Mando's wrongful acts are enjoined by this Court pursuant to 35 U.S.C. § 283.

47. Mando's infringement has caused and continues to cause damage to JLR and JLR is entitled to recover damages in an amount subject to proof at trial pursuant to 35 U.S.C. § 284.

COUNT TWO — INFRINGEMENT OF THE '333 PATENT

48. JLR repeats and realleges the allegations of Paragraphs 1 through 47 above as if fully set forth herein.

49. Mando has directly infringed and continues to infringe at least claim 6 of the '333 patent by making, using, offering for sale within the United States and/or importing into the United States its DBC systems.

50. Claim 6 of the '333 patent discloses:

6. A braking system for a vehicle having wheels and a transmission which can be shifted between a plurality of transmission ratios including a higher ratio and a lower ratio, the system comprising brakes for braking the wheels, a controller for controlling application of the brakes, and a ratio detector for detecting at which ratio the transmission is operating, wherein the controller defines a target speed and a magnitude of the target speed is dependent on which transmission ratio is selected, the controller is arranged to control the brakes so as to maintain the speed of the vehicle at the target speed, and the target speed is higher when the higher ratio is selected than when the lower ratio is selected.

51. On information and belief, Mando's DBC satisfies all the limitations of claim 6 of the '333 patent.

52. The preamble of Claim 6 recites: "A braking system for a vehicle having wheels and a transmission which can be shifted between a plurality of transmission ratios including a higher ratio and a lower ratio, the system

comprising . . .” If the preamble is a limitation, Mando’s accused DBC product meets the limitation.

53. Vehicles utilizing Mando’s DBC have both wheels and transmission systems that can be shifted. For example, the Kia Sportage is available with a six-speed automatic transmission. *See, e.g., 2016 Kia Sportage Features & Options*, Kia Media, <http://www.kiamedia.com/us/en/models/sportage/2016/features> (last visited Apr. 28, 2016). Each of the six-speeds is associated with a higher or lower transmission ratio.

2016 Kia Sportage Features & Options

S = Standard -- = Not Available O = Optional

MECHANICAL	LX	EX	SX
2.4L GDI I4 Engine	S	S	--
2.0L Turbo GDI I4 Engine	--	--	S
6-speed automatic transmission with H-Matic	S	S	S

54. Claim 6 of the ’333 patent further recites that the patented system comprises “brakes for braking the wheels, a controller for controlling application of the brakes, and a ratio detector for detecting at which ratio the transmission is operating, . . .” Vehicles utilizing Mando’s DBC also have each of these features.

55. First, the vehicles have brakes. *See e.g., Hyundai Santa Fe Returns In 2014 With New Safety Technologies And Premium Comfort Features For The*

Whole Family (“Santa Fe also features a state-of-the-art braking package. The package includes four-wheel disc brakes (12.6 inch front and 11.9 inch rear), an Anti-Lock Braking System (ABS) including Brake Assist providing maximum braking force when a panic stop is detected, and Electronic Brake-force Distribution (EBD) to automatically adjust the braking force to front and rear axles, based on vehicle loading conditions.”) (<http://hyundainews.com/us/en-us/Media/PressRelease.aspx?mediaid=39207>); *id.* (“All 2014 Santa Fe trims feature Hyundai’s Hillstart Assist Control (HAC) and Downhill Brake Control (DBC) to maximize control on steep hills. HAC minimizes rolling backwards on steep ascents, while DBC helps the driver maintain vehicle control and speed on steep downhill descents. By selecting the DBC switch, the Hydro-Electronic Control unit manages the wheel speed sensors, steering angle sensor and acceleration sensor to maintain control and speed on steep declines without having to use the brake.”).

56. Second, the accused Mando DBC has a controller. *See e.g.*, Press Release, Hyundai Santa Fe Returns in 2014 with New Safety Technologies and Premium Comfort Features for the Whole Family, Hyundai (Oct. 1, 2013), *available at* https://www.hyundaiusa.com/about-hyundai/news/corporate_hyundai_santa_fe_returns_in_2014_with_new_safety_technologies_and_premium_comfort_features-20131001.aspx (“[b]y selecting the

DBC switch, the Hydro-Electronic Control unit manages the wheel speed sensors, steering angle sensor and acceleration sensor to maintain control and speed on steep declines”).

57. Third, vehicles containing Mando’s DBC have a ratio detector to determine the transmission ratio in which the vehicle is operating. For example, when the vehicle is set to reverse gear, the vehicle detects that gear and enables certain features. The Kia Sportage has a rear view camera that automatically operates when the car is on and the transmission shift lever is positioned in reverse. The camera automatically stops operating when the transmission lever is set to a different gear. *Kia Sportage 2016 Owner’s Manual*, at 251.

58. Claim 6 of the ’333 patent further recites “wherein the controller defines a target speed and a magnitude of the target speed is dependent on which transmission ratio is selected, the controller is arranged to control the brakes so as to maintain the speed of the vehicle at the target speed, . . .” Mando’s DBC satisfies this limitation. It operates through a controller, which defines the target speed and controls the brakes to maintain the speed of the vehicle. *See e.g.*, Pres Release, Hyundai Santa Fe Returns in 2014 with New Safety Technologies and Premium Comfort Features for the Whole Family, Hyundai (Oct. 1, 2013), *available at* https://www.hyundaiusa.com/about-hyundai/news/corporate_hyundai_santa_fe_returns_in_2014_with_new_safety_tec

hnologies_and_premium_comfort_features-20131001.aspx (“[b]y selecting the DBC switch, the Hydro-Electronic Control unit manages the wheel speed sensors, steering angle sensor and acceleration sensor to maintain control and speed on steep declines”); *Downhill Brake Control (DBC)*, Hyundai Santa Fe Owner’s Manual, http://www.hyundaisantafemanual.com/santafe-204-downhill_brake_control_dbc_.html (last visited Apr. 28, 2016) (“The Downhill Brake Control (DBC) assists the driver when descending a steep hill without the driver depressing the brake pedal. It slows the vehicle to under approximately 6.3 mph (10 km/h) and lets the driver concentrate on steering the vehicle.”).

59. Claim 6 of the ’333 patent further recites that “the target speed is higher when the higher ratio is selected than when the lower ratio is selected.” On information and belief, Mando’s DBC has different target speeds which correlate to different transmission ratios.

60. As described in the preceding paragraphs, each limitation of claim 6 of the ’333 patent is met by the accused Mando DBC, either literally or under the doctrine of equivalents.

61. Mando has infringed and continues to infringe the ’333 patent by making, using, selling, offering for sale, and/or importing into the United States the Mando DBC covered by one or more claims of the ’333 patent. Mando is liable to JLR for infringement of ’333 patent pursuant to 35 U.S.C. § 271(a).

62. Mando has been on notice of the '333 patent and the Mando brake systems accused of infringing the '333 patent since at least March 24, 2014. Mando's infringement of the '333 patent has been and is willful and deliberate, entitling JLR to enhanced damages pursuant to 35 U.S.C. § 284 and recovery of attorneys' fees and costs pursuant to 35 U.S.C. § 285.

63. Mando's infringement of the '333 patent will continue to damage JLR's business, causing irreparable harm, for which there is no adequate remedy at law, unless Mando's wrongful acts are enjoined by this Court pursuant to 35 U.S.C. § 283.

64. Mando's infringement has caused and continues to cause damage to JLR and JLR is entitled to recover damages in an amount subject to proof at trial pursuant to 35 U.S.C. § 284.

COUNT THREE — INFRINGEMENT OF THE '640 PATENT

65. JLR repeats and realleges the allegations of Paragraphs 1 through 64 above as if fully set forth herein.

66. Mando has directly infringed and continues to infringe at least claim 1 of the '640 patent by making, using, offering for sale within the United States and/or importing into the United States its DBC systems.

67. Claim 1 of the '640 patent discloses:

1. A braking system for a vehicle, the system comprising brakes, a vehicle speed sensor for measuring

a vehicle speed, and a controller having a target speed and a maximum rate of change of acceleration defined therein and being arranged to control application of the brakes so as to bring the vehicle speed towards the target speed, wherein the controller is arranged, as the vehicle speed approaches the target speed, to control the vehicle brakes so that the rate of change of acceleration of the vehicle does not exceed said maximum rate of change of acceleration.


68. On information and belief, Mando's DBC systems satisfies all the limitations of claim 1 of the '640 patent.

69. The preamble of Claim 1 of the '640 patent recites: "A braking system for a vehicle, the system comprising . . ." If the preamble is a limitation, Mando's accused DBC product meets the limitation. Mando's DBC is a braking system for a vehicle.

70. Claim 1 of the '640 patent further recites that the patented system comprises "brakes, a vehicle speed sensor for measuring a vehicle speed, and a controller . . ." Mando's accused DBC is designed to be included in a vehicle that has all three components.

71. First, vehicles utilizing Mando's DBC have brakes. For example, the Hyundai Santa Fe has four-wheel disc brakes, an Anti-Lock Braking System ("ABS") with Electronic Brake-force Distribution ("EDB") and Brake Assist ("BA"). *See, e.g., 2017 Santa Fe: Features & Specifications*, Hyundai,

<https://www.hyundaiusa.com/santa-fe/specifications.aspx> (last visited Apr. 28, 2016).

 Santa Fe Gallery Exterior Interior Performance	
SE \$30,800 MSRP	
VIEW DIFFERENCES ONLY + EXPAND ALL	
4-wheel, 4-channel Anti-lock Braking System (ABS) with Electronic Brake-force Distribution (EBD) and Brake Assist (BA)	Standard
Downhill Brake Control (DBC)	Standard

72. Second, vehicles utilizing Mando’s DBC have a vehicle speed sensor. *See, e.g.*, Hyundai Santa Fe Owner’s Manual, at Section 4, page 71 (“The speedometer indicates the speed of the vehicle and is calibrated in miles per hour (mph) and/or kilometers per hour (km/h).”)

73. Third, Mando’s DBC is incorporated in cars that have a controller. For example, the Hyundai Santa Fe contains a Hydro-Electric Control unit, and by activating the DBC, this unit will manage various sensors to maintain control on steep hills. *See, e.g.*, Hyundai Santa Fe Returns In 2014 With New Safety Technologies And Premium Comfort Features For The Whole Family (“By selecting the DBC switch, the Hydro-Electronic Control unit manages the wheel speed sensors, steering angle sensor and acceleration sensor to maintain control and speed on steep declines without having to use the brake.”) (<http://hyundaiusa.com/us/en-us/Media/PressRelease.aspx?mediaid=39207>).

74. Claim 1 of the '640 patent further recites the controller “having a target speed and a maximum rate of change of acceleration defined therein and being arranged to control application of the brakes so as to bring the vehicle speed towards the target speed, . . .” Mando’s DBC meets this limitation.

75. First, the Mando DBC operates by engaging the brakes to maintain a set speed. *See, e.g., Downhill Brake Control (DBC), Hyundai Santa Fe Owner’s Manual*, http://www.hyundaisantafemanual.com/santafe-204-downhill_brake_control_dbc_.html (last visited Apr. 28, 2016) (“The Downhill Brake Control (DBC) assists the driver when descending a steep hill without the driver depressing the brake pedal. It slows the vehicle to under approximately 6.3 mph (10 km/h) and lets the driver concentrate on steering the vehicle.”); Kif Richmann, *Kia Sorento Makes a Great Winter Vehicle*, McGrath Kia (Dec. 11, 2012), *available at* <http://blog.mcgrathkia.com/kia-sorento-makes-a-great-winter-vehicle/> (“Equipped with Hill Decent Control, the Kia Sorento engages the appropriate anti-lock brake to maintain 5 mph throughout the downhill trip, allowing you to focus on steering.”)

76. Second, on information and belief, Mando’s DBC controller also has a maximum rate of change of acceleration.

77. Claim 1 of the '640 patent further recites “wherein the controller is arranged, as the vehicle speed approaches the target speed, to control the vehicle

brakes so that the rate of change of acceleration of the vehicle does not exceed said maximum rate of change of acceleration.” As noted above, on information and belief Mando’s DBC has a target speed and a maximum rate of change of acceleration. The DBC controller operates by controlling the vehicles brakes to approach the target speed without exceeding the maximum rate of change of acceleration. *See, e.g.,* Hyundai Santa Fe Returns In 2014 With New Safety Technologies And Premium Comfort Features For The Whole Family (“By selecting the DBC switch, the Hydro-Electronic Control unit manages the wheel speed sensors, steering angle sensor and acceleration sensor to maintain control and speed on steep declines without having to use the brake.”) (<http://hyundainews.com/us/en-us/Media/PressRelease.aspx?mediaid=39207>)

78. As described in the preceding paragraphs, each limitation of claim 1 of the ’640 patent is met by the accused Mando DBC, either literally or under the doctrine of equivalents.

79. Mando has infringed and continues to infringe the ’640 patent by making, using, selling, offering for sale, and/or importing into the United States the Mando DBC covered by one or more claims of the ’640 patent. Mando is liable to JLR for infringement of ’640 patent pursuant to 35 U.S.C. § 271(a).

80. Mando has been on notice of the ’640 patent and the Mando brake systems accused of infringing the ’640 patent since at least March 24, 2014.

Mando's infringement of the '640 patent has been and is willful and deliberate, entitling JLR to enhanced damages pursuant to 35 U.S.C. § 284 and recovery of attorneys' fees and costs pursuant to 35 U.S.C. § 285.

81. Mando's infringement of the '640 patent will continue to damage JLR's business, causing irreparable harm, for which there is no adequate remedy at law, unless Mando's wrongful acts are enjoined by this Court pursuant to 35 U.S.C. § 283.

82. Mando's infringement has caused and continues to cause damage to JLR and JLR is entitled to recover damages in an amount subject to proof at trial pursuant to 35 U.S.C. § 284.

COUNT FOUR — INFRINGEMENT OF THE '488 PATENT

83. JLR repeats and realleges the allegations of Paragraphs 1 through 82 above as if fully set forth herein.

84. Mando has directly infringed and continues to infringe at least claim 1 of the '488 patent by making, using, offering for sale within the United States and/or importing into the United States its TCS systems.

85. Claim 1 of the '488 patent discloses:

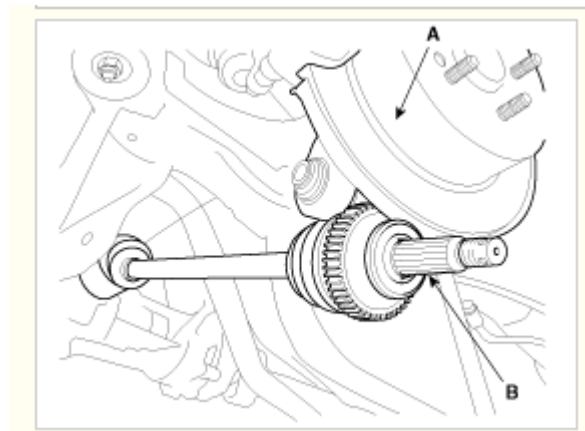
1. A traction control system for a vehicle having at least one drive axle with a differential operable between wheels at each end of the axle, and brakes for each respective wheel operable by a brake system controller, the traction control system including wheel speed sensors which sense the rotational speed of said wheels, an

engine torque demand sensor and an engine torque output monitor, the brake system controller receiving signals from said sensors and monitor when the engine torque output is less than the maximum torque output for a given torque demand the brake system controller is operable to apply the brakes to equalize the rotational speeds of the wheels to achieve said maximum torque output under the applied braking load.

86. On information and belief, Mando's TCS satisfies all of the limitations of claim 1 of the '488 patent.

87. Claim 1 of the '488 patent recites: "A traction control system for a vehicle . . ." Mando's TCS is intended to be incorporated into vehicles.

88. Claim 1 of the '488 patent further recites that vehicle "having at least one drive axle with a differential operable between wheels at each end of the axle, . . ." Vehicles utilizing Mando's TCS have at least one drive axle. *See, e.g., Kia Sorento: Rear Hub - Carrier Removal*, Kia Sorento Car Manuals Technical Info, http://www.ksmanual.com/rear_hub_carrier_removal-744.html (last visited Apr. 20, 2016) (explaining rear axle assembly and how to remove the carrier hub).



Vehicles utilizing Mando's TCS systems also have differentials operable between the wheels at each end of the axle. *See, e.g., Kia Sorento: Rear Differential Carrier Component*, Kia Sorento Car Manuals Technical Info, http://www.ksmanual.com/rear_differential_carrier_component-757.html (last visited Apr. 20, 2016) (explaining rear differential carrier component).



89. Claim 1 of the '488 patent further recites that the vehicle has “brakes for each respective wheel operable by a brake system controller, . . .” Vehicles utilizing Mando's TCS have brakes for each wheel, operable by a controller. *See, e.g., Kia Sorento 2016 Safety Features*, Kia, <http://www.kia.com/us/en/vehicle/sorento/2016/features> (last visited Apr. 28, 2016) (describing the four-wheel disc brakes available on Kia Sorento).

Sorento 2016 SAFETY	Filter ▼	L starting at \$25,100	LX starting at \$26,400	LX V6 starting at \$28,700	EX starting at \$31,100	EX V6 starting at \$32,100	SX V6 starting at \$38,300	LIMITED starting at \$39,900	LIMITED V6 starting at \$41,500
✓ 4-Wheel Disc Brakes w/ABS		STANDARD	STANDARD	STANDARD	STANDARD	STANDARD	STANDARD	STANDARD	STANDARD

The foundation of your Kia's active safety system, the Antilock Braking System (ABS) uses electronic sensors at each wheel hub to detect when wheels begin skid. If skidding under braking is detected, ABS modulates brake force to reduce skidding which in turn allows for reduced braking distances in addition to helping you maintain control of your vehicle.

[*Disclaimers >](#)

90. Claim 1 of the '488 patent further recites “the traction control system including wheel speed sensors which sense the rotational speed of said wheels, . . .” Mando’s TCS includes wheel sensors that sense rotational speed of wheels. *See, e.g., Kia Sorento 2016 Safety Features*, Kia, <http://www.kia.com/us/en/vehicle/sorento/2016/features> (last visited Apr. 28, 2016) (“The advanced Traction Control System (TCS) can sense wheel spin during acceleration. Using a combination of engine power and brake force, power is transferred to the wheels that have the most traction offering increased control and traction.”).

91. Claim 1 of the '488 patent further recites “an engine torque demand sensor and an engine torque output monitor, . . .” On information and belief, Mando’s TCS includes engine torque demand sensors and output monitors. *See, e.g., Kia Sorento Description of ECS*, Kia Sorento Car Manuals Technical Information, http://www.ksmanual.com/description_of_esc-941.html (last visited Apr. 20, 2016) (“TCS function prevents the wheel slip of drive direction by adding the brake pressure and engine torque reduction via CAN communication.”)

92. Claim 1 of the '488 patent further recites “the brake system controller receiving signals from said sensors and monitor . . .” On information and belief, Mando’s TCS receives signals from the aforementioned sensors and monitors. *See, e.g., Kia Sorento Description of ECS*, Kia Sorento Car Manuals Technical Information, http://www.ksmanual.com/description_of_esc-941.html (last visited Apr. 20, 2016) (“TCS function prevents the wheel slip of drive direction by adding the brake pressure and engine torque reduction via CAN communication.”); *Kia Sorento 2016 Safety Features*, Kia, <http://www.kia.com/us/en/vehicle/sorento/2016/features> (last visited Apr. 28, 2016) (“The advanced Traction Control System (TCS) can sense wheel spin during acceleration.”).

93. Claim 1 of the '488 patent further recites that “when the engine torque output is less than the maximum torque output for a given torque demand the brake system controller is operable to apply the brakes to equalize the rotational speeds of the wheels to achieve said maximum torque output under the applied braking load.” On information and belief, Mando’s TCS operates by applying brakes to equalize wheel rotation and achieve maximum torque output. *See, e.g., Kia Sorento 2016 Safety Features*, Kia, <http://www.kia.com/us/en/vehicle/sorento/2016/features> (last visited Apr. 28, 2016) (“The advanced Traction Control System (TCS) can sense wheel spin during

acceleration. Using a combination of engine power and brake force, power is transferred to the wheels that have the most traction offering increased control and traction.”); *Kia Sorento Description of ECS*, Kia Sorento Car Manuals Technical Information, http://www.ksmanual.com/description_of_esc-941.html (last visited Apr. 20, 2016) (“TCS function prevents the wheel slip of drive direction by adding the brake pressure and engine torque reduction via CAN communication. TCS function uses the wheel speed sensor signal to determine the wheel slip as far as ABS function.”).

94. As described in the preceding paragraphs, each limitation of claim 1 of the ’488 patent is met by the accused Mando DBC, either literally or under the doctrine of equivalents.

95. Mando has infringed and continues to infringe the ’488 patent by making, using, selling, offering for sale, and/or importing into the United States the Mando DBC covered by one or more claims of the ’488 patent. Mando is liable to JLR for infringement of ’488 patent pursuant to 35 U.S.C. § 271(a).

96. Mando’s infringement of the ’488 patent will continue to damage JLR’s business, causing irreparable harm, for which there is no adequate remedy at law, unless Mando’s wrongful acts are enjoined by this Court pursuant to 35 U.S.C. § 283.

97. Mando's infringement has caused and continues to cause damage to JLR and JLR is entitled to recover damages in an amount subject to proof at trial pursuant to 35 U.S.C. § 284.

PRAYER FOR RELIEF

WHEREFORE, Land Rover respectfully requests that this Court enter judgment that:

- A. Mando infringes the '614 patent;
- B. Mando infringes the '333 patent;
- C. Mando infringes the '640 patent;
- D. Mando infringes the '488 patent;
- E. Mando its officers, agents, servants, employees and attorneys, and all persons acting in concert or participation with them, be preliminarily and permanently enjoined from further acts of infringement;
- F. JLR be awarded damages adequate to compensate for Mando's infringement, pursuant to 35 U.S.C. § 284, including prejudgment and post-judgment interest;
- G. JLR be awarded treble damages for Mando's willful infringement, pursuant to 35 U.S.C. § 284;
- H. An accounting and/or supplemental damages for all damages occurring after any discovery cutoff and through the Court's decision regarding the imposition of a permanent injunction;
- I. An award of attorneys' fees based on this being an exceptional case pursuant to 35 U.S.C. § 285, including prejudgment interest on such fees;
- J. Costs and expenses in this action; and
- K. An award of such other and further relief as the Court deems

necessary, just and/or proper.

JURY TRIAL DEMANDED

JLR respectfully demands a trial by jury on all issues triable to a jury.

Dated: April 28, 2016

Respectfully submitted,

REISING ETHINGTON

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